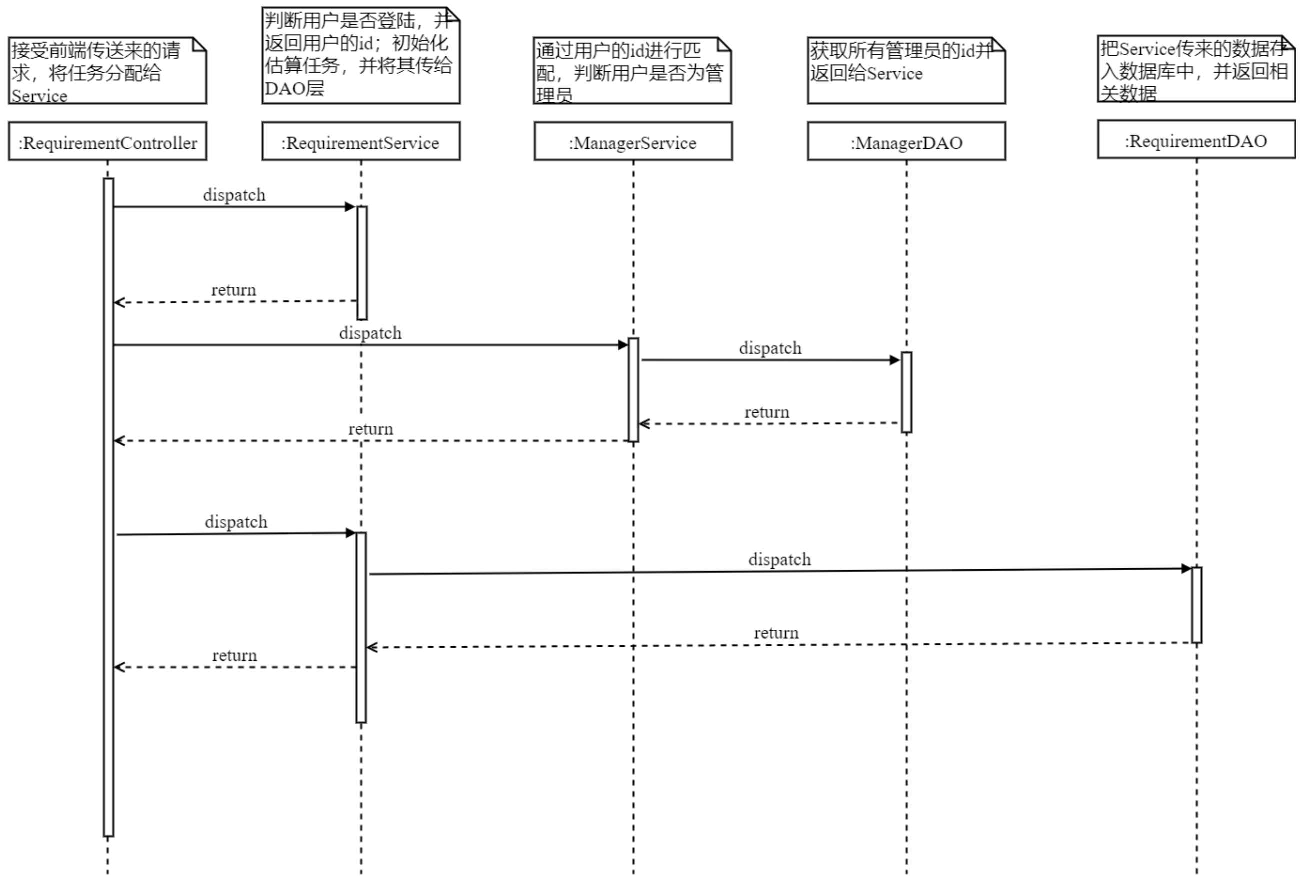
Detailed Design

Process Flow Design

The sequence diagram is to show the whole process of the system from the entry point to the end point, for each user scenario. Here are our sequence diagrams:

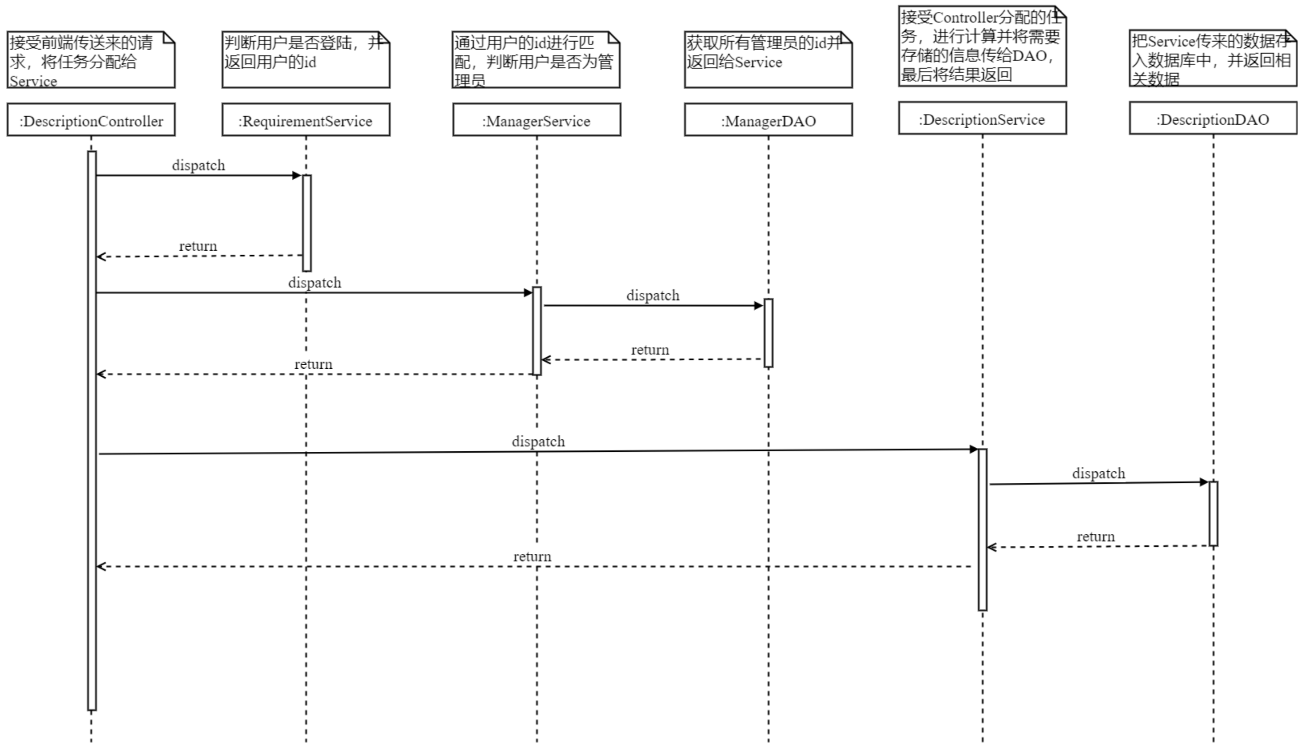
Create Estimate Task


接受前端传送来的请求，将任务分配给Service
判断用户是否登陆，并返回用户的id；初始化估算任务，并将其传给DAO层
通过用户的id进行匹配，判断用户是否为管理员
获取所有管理员的id并返回给Service
把Service传来的数据存入数据库中，并返回相关数据
:RequirementController
:RequirementService
:ManagerService
:ManagerDAO
:RequirementDAO
dispatch
return
dispatch
dispatch
return
return
dispatch
dispatch
return
return

When a user sends a request to create an estimate task through the front-end interface, the backend controller first determines whether it is logged in, and when it is determined that it is logged on, it further determines whether it is an administrator.

When confirming that the sending request is a regular user, controller assigns the task to the corresponding method in the service, and the service will use the method of the DAO class to deposit it in the database after completing the initialization of the estimate task, and return the ID of the estimate task.

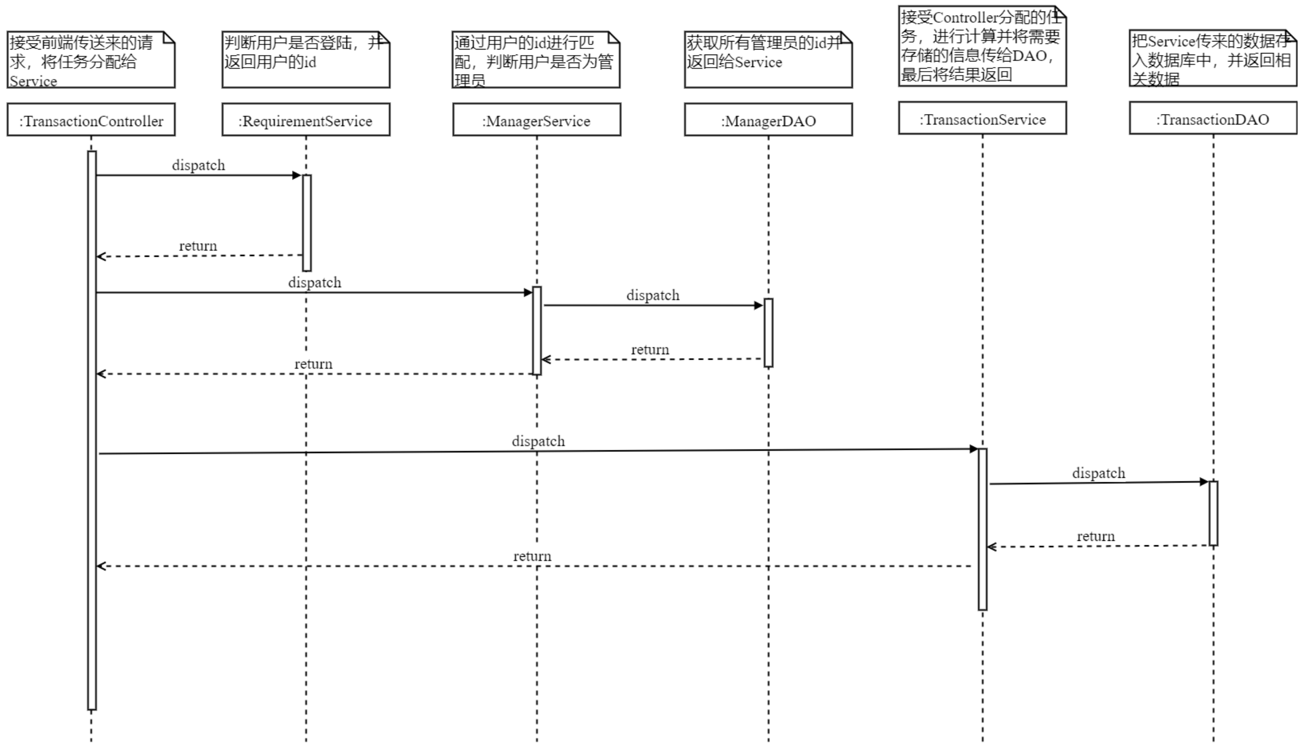
Add Project Description


接受前端传送来的请求，将任务分配给Service
判断用户是否登陆，并返回用户的id
通过用户的id进行匹配，判断用户是否为管理员
获取所有管理员的id并返回给Service
接受Controller分配的任务，进行计算并将需要存储的信息传给DAO，最后将结果返回
把Service传来的数据存入数据库中，并返回相关数据
:DescriptionController
:RequirementService
:ManagerService
:ManagerDAO
:DescriptionService
:DescriptionDAO
dispatch
return
dispatch
dispatch
return
return
dispatch
dispatch
return
return

When a user sends a request to add a project description through the front-end interface, the backend controller first determines whether it is logged in, and when it is determined that it is logged in, it is further judged as an administrator.

When confirming that the request is sent to a regular user, controller will assign the task to the corresponding method in the service, and the service will, after parsing the JSON data sent by the front end, store it in the database using the DAO method.

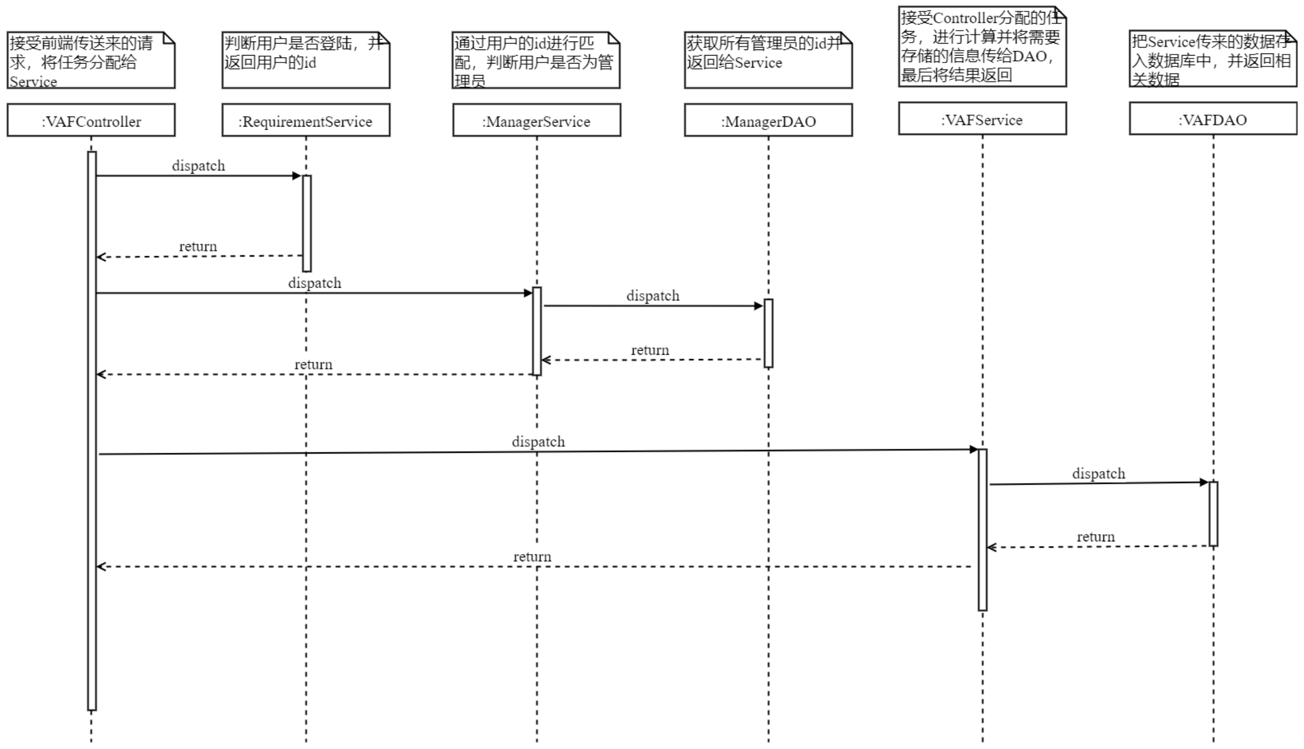
Functional decomposition


接受前端传送来的请求，将任务分配给Service
判断用户是否登陆，并返回用户的id
通过用户的id进行匹配，判断用户是否为管理员
获取所有管理员的id并返回给Service
接受Controller分配的任务，进行计算并将需要存储的信息传给DAO，最后将结果返回
把Service传来的数据存入数据库中，并返回相关数据
:TransactionController
:RequirementService
:ManagerService
:ManagerDAO
:TransactionService
:TransactionDAO
dispatch
return
dispatch
dispatch
return
return
dispatch
dispatch
return
return

When a user sends a request to add a function decomposition through the front-end interface, the backend controller first determines whether it is logged in, and when it is determined that it has landed, it is further judged as an administrator.

When confirming that the request is sent to a regular user, controller will assign the task to the corresponding method in the service, and the service will, after parsing the JSON data sent by the front end, store it in the database using the DAO method.

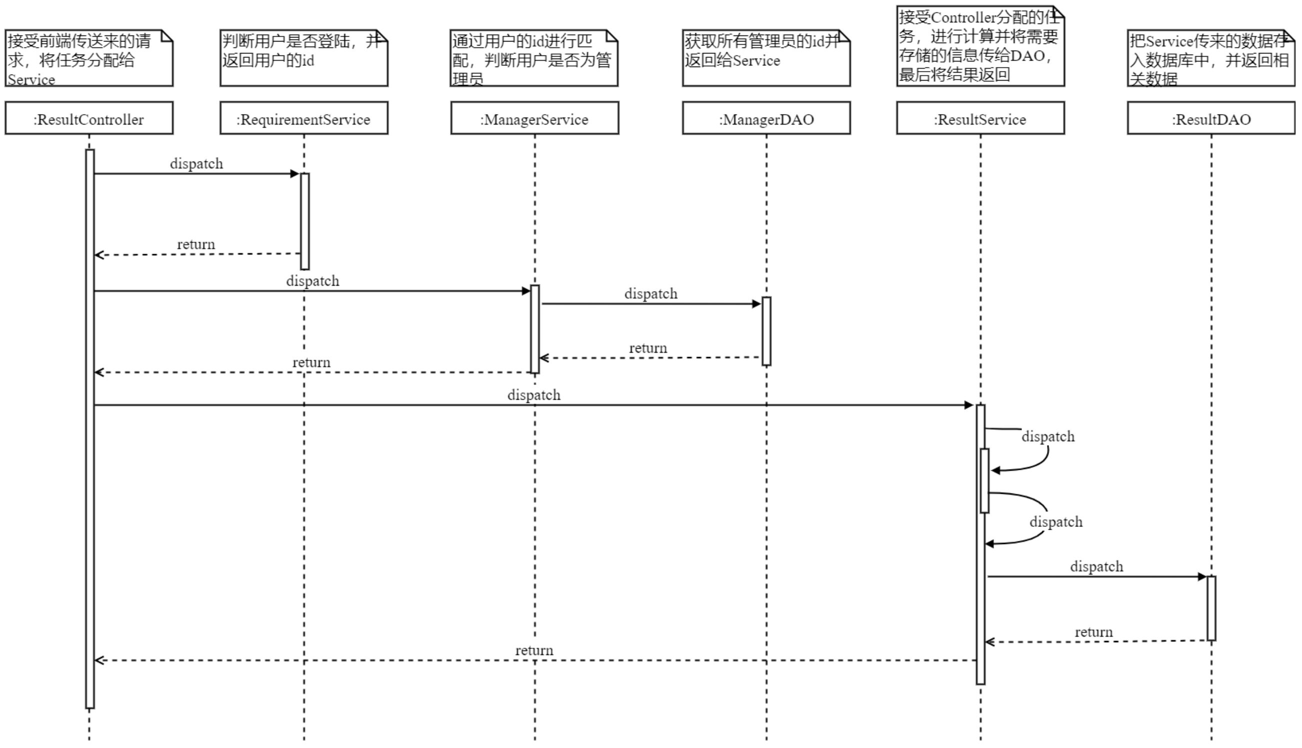
Add Adjustment factor


接受前端传送来的请求，将任务分配给Service
判断用户是否登陆，并返回用户的id
通过用户的id进行匹配，判断用户是否为管理员
获取所有管理员的id并返回给Service
接受Controller分配的任务，进行计算并将需要存储的信息传给DAO，最后将结果返回
把Service传来的数据存入数据库中，并返回相关数据
:VAFController
:RequirementService
:ManagerService
:ManagerDAO
:VAFService
:VAFDAO
dispatch
return
dispatch
dispatch
return
return
dispatch
dispatch
return
return

When a user sends a request to add an adjustment factor through the front-end interface, the backend controller first determines whether it is logged in, and when it is determined that it has landed, it is further judged as an administrator.

When confirming that a regular user is sending the request, controller assigns the task to the service to add the adjustment factor, and the service will use the DAO method to deposit it in the database after parsing the JSON data sent by the front-end.

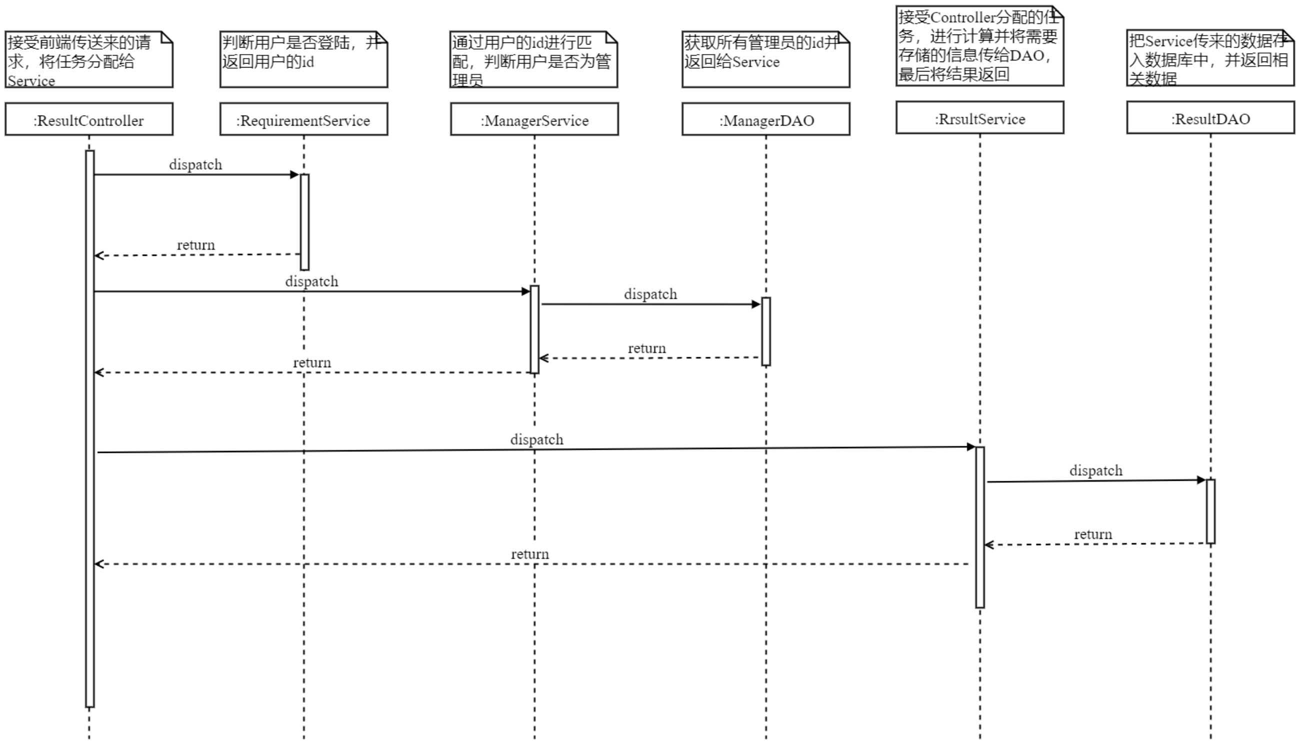
Update Estimate Data


接受前端传送来的请求，将任务分配给Service
判断用户是否登陆，并返回用户的id
通过用户的id进行匹配，判断用户是否为管理员
获取所有管理员的id并返回给Service
接受Controller分配的任务，进行计算并将需要存储的信息传给DAO，最后将结果返回
把Service传来的数据存入数据库中，并返回相关数据
:ResultController
:RequirementService
:ManagerService
:ManagerDAO
:ResultService
:ResultDAO
dispatch
return
dispatch
dispatch
return
return
dispatch
dispatch
dispatch
dispatch
return
return

When a user sends a request to update the estimated data through the front-end interface, the backend controller first determines whether it is logged in, and when it is determined that it has landed, it is further judged as an administrator.

When the administrator is confirmed to send the request, controller assigns the task to the service to update the method of estimating the data, and the service will after parsing the JSON data sent by the front-end and using the IFPUG algorithm, The method of DAO is used to update the estimate data and store it in the database.

Get Estimation Report


接受前端传送来的请求，将任务分配给Service
判断用户是否登陆，并返回用户的id
通过用户的id进行匹配，判断用户是否为管理员
获取所有管理员的id并返回给Service
接受Controller分配的任务，进行计算并将需要存储的信息传给DAO，最后将结果返回
把Service传来的数据存入数据库中，并返回相关数据
:ResultController
:RequirementService
:ManagerService
:ManagerDAO
:RrsultService
:ResultDAO
dispatch
return
dispatch
dispatch
return
return
dispatch
dispatch
return
return

When a user sends a request to obtain an estimate report through the front-end interface, the backend controller first determines whether it is logged in, and when it is determined that it has landed, it is further judged as an administrator.

When the administrator is confirmed to send the request, controller assigns the task to the service to obtain the estimate report, and the service borrows the DAO method to obtain the corresponding estimate report and returns it to the controller. Finally, Controller will send the retrieved data back to the front.

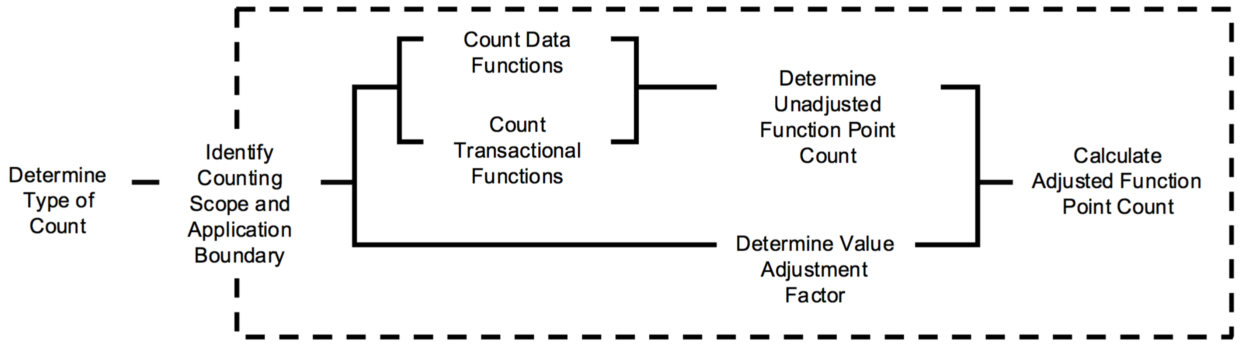
Algorithm Design

We use IFPUG Function Point Analysis Algorithm

Background

Function point analysis is a scale estimation method based on system function in the phase of requirement analysis, which is based on the indirect scale measurement of external, internal and software performance of the application software.

algorithm framework (flowchart of pseudocde)


Determine Type of Count
Identify Counting Scope and Application Boundary
Count Data Functions
Count Transactional Functions
Determine Unadjusted Function Point Count
Determine Value Adjustment Factor
Calculate Adjusted Function Point Count

Key Steps

1. **Determine Type of Count**

Point analysis method defines three function point counting types: New development project function point count, enhancement item function point count, application system function point count.

2. **Identify Counting Scope and Application Boundary**

The boundaries of the project define the boundaries between the calculated system and the external system and the user. The boundaries between systems should be defined as far as possible from the perspective of business functions. The counting range defines all functions that will be computed as a function point, and its delineation is determined by the type that performs the function point count.

3. **Count Data Functions**

Data function satisfies the functional user requirements for storing and referencing data. When counting data function, the data is divided into a logical file according to the logical relationship between the data, and the complexity of each logical file is determined.

IFPUG divides data functionality into two categories: internal logical files (ILF) and external interface files (EIF). The complexity of the data functionality is determined by the number of data element types (DET) and record element types (RET).

4. **Count Transactional Functions**

The transaction function represents the function that is used to process data provided to the user. When counting the transaction function, first identify the minimum activity unit that is meaningful to the user and can maintain business continuity as the basic process, and then differentiate it from external input (EI), external output (EO), or external query (EQ), and finally determines the complexity of transaction functionality by referencing the number of file types and data element types.The complexity of transactional functionality is determined by the number of Det and file Type Reference (FTR).

5. **Determine Unadjusted Function Point Count**

UFP=DFP+TFP

TFP=EI+EO+EQ

DFP=ILF+EIF

6. **Determine Value Adjustment Factor**

Value Adjustment Factor introduced.

VAF=(TDI*0.01)+0.65

7. **Calculate Adjusted Function Point Count**

Feature points are usually multiplied by UFP and VAF.

FP=UFP*VAF

New development:

FP=(UFP+CFP)*VAF

Enhancement:

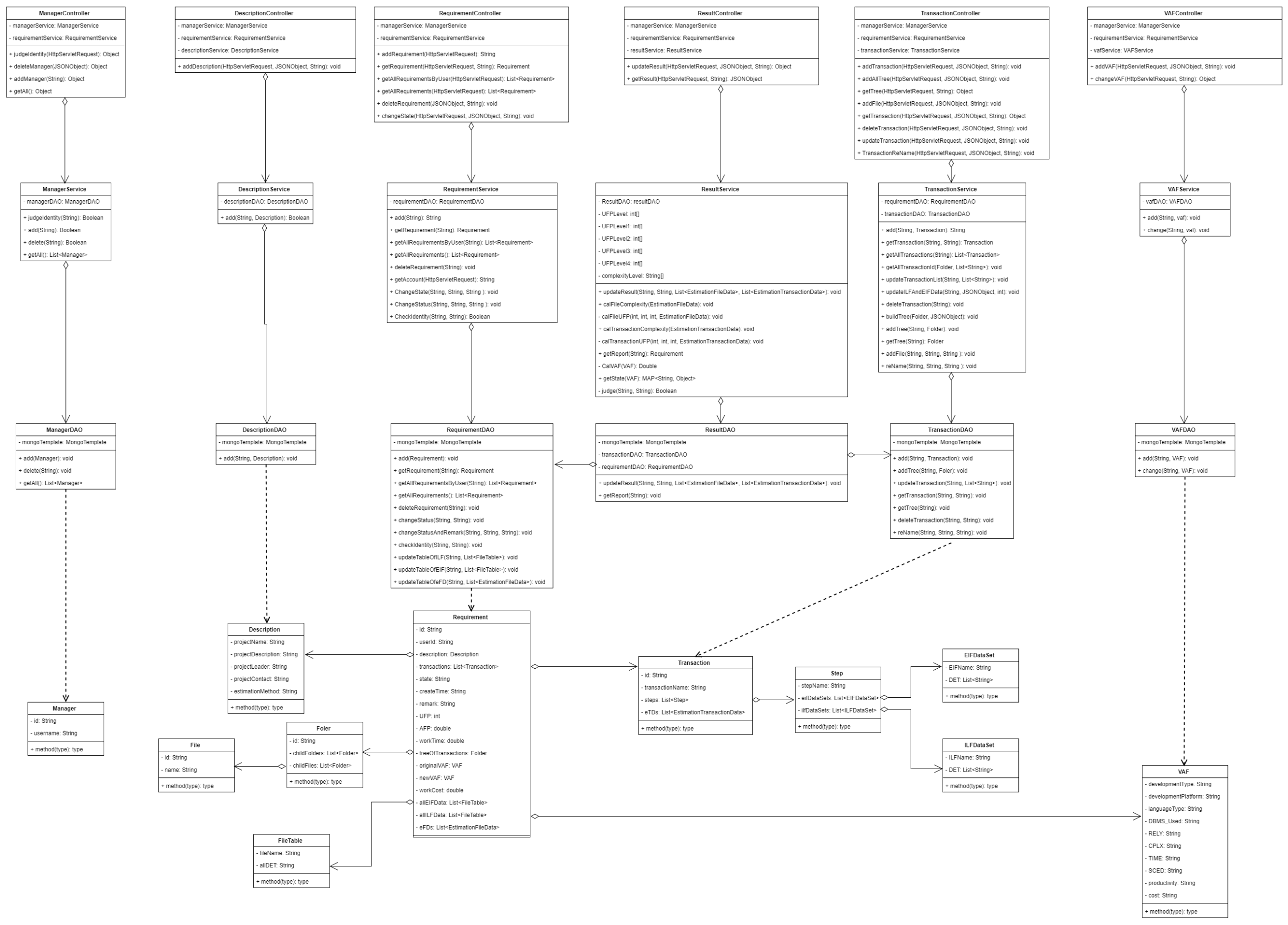
FP=(ADD+CHGA+CPA)*VAFA+(DEL+VAFB)

Re-development:

FP=[(UFPB+ADD+CHGA)-(CHGB+DEL)]*VAFA

Class Design

Here is the total class diagram of our project.


ManagerController
- managerService: ManagerService
- requirementService: RequirementService
+ judgeIdentity(HttpServletRequest): Object
+ deleteManager(JSONObject): Object
+ addManager(String): Object
+ getAll(): Object
DescriptionController
- managerService: ManagerService
- requirementService: RequirementService
- descriptionService: DescriptionService
+ addDescription(HttpServletRequest, JSONObject, String): void
RequirementController
- managerService: ManagerService
- requirementService: RequirementService
+ addRequirement(HttpServletRequest): String
+ getRequirement(HttpServletRequest, String): Requirement
+ getAllRequirementsByUser(HttpServletRequest): List<Requirement>
+ getAllRequirements(HttpServletRequest): List<Requirement>
+ deleteRequirement(JSONObject, String): void
+ changeState(HttpServletRequest, JSONObject, String): void
ResultController
- managerService: ManagerService
- requirementService: RequirementService
- resultService: ResultService
+ updateResult(HttpServletRequest, JSONObject, String): Object
+ getResult(HttpServletRequest, String): JSONObject
TransactionController
- managerService: ManagerService
- requirementService: RequirementService
- transactionService: TransactionService
+ addTransaction(HttpServletRequest, JSONObject, String): void
+ addAllTree(HttpServletRequest, JSONObject, String): void
+ getTree(HttpServletRequest, String): Object
+ addFile(HttpServletRequest, JSONObject, String): void
+ getTransaction(HttpServletRequest, JSONObject, String): Object
+ deleteTransaction(HttpServletRequest, JSONObject, String): void
+ updateTransaction(HttpServletRequest, JSONObject, String): void
+ TransactionReName(HttpServletRequest, JSONObject, String): void
VAFController
- managerService: ManagerService
- requirementService: RequirementService
- vafService: VAFService
+ addVAF(HttpServletRequest, JSONObject, String): void
+ changeVAF(HttpServletRequest, String): Object
ManagerService
- managerDAO: ManagerDAO
+ judgeIdentity(String): Boolean
+ add(String): Boolean
+ delete(String): Boolean
+ getAll(): List<Manager>
DescriptionService
- descriptionDAO: DescriptionDAO
+ add(String, Description): Boolean
RequirementService
- requirementDAO: RequirementDAO
+ add(String): String
+ getRequirement(String): Requirement
+ getAllRequirementsByUser(String): List<Requirement>
+ getAllRequirements(): List<Requirement>
+ deleteRequirement(String): void
+ getAccount(HttpServletRequest): String
+ ChangeState(String, String, String): void
+ ChangeStatus(String, String, String): void
+ CheckIdentity(String, String): Boolean
ResultService
- ResultDAO: resultDAO
- UFPLevel: int[]
- UFPLevel1: int[]
- UFPLevel2: int[]
- UFPLevel3: int[]
- UFPLevel4: int[]
- complexityLevel: String[]
+ updateResult(String, String, List<EstimationFileData>, List<EstimationTransactionData>): void
+ calFileComplexity(EstimationFileData): void
- calFileUFP(int, int, int, EstimationFileData): void
+ calTransactionComplexity(EstimationTransactionData): void
- calTransactionUFP(int, int, int, EstimationTransactionData): void
+ getReport(String): Requirement
- CalVAF(VAF): Double
+ getState(VAF): MAP<String, Object>
- judge(String, String): Boolean
TransactionService
- requirementDAO: RequirementDAO
- transactionDAO: TransactionDAO
+ add(String, Transaction): String
+ getTransaction(String, String): Transaction
+ getAllTransactions(String): List<Transaction>
+ getAllTransactionId(Folder, List<String>): void
+ updateTransactionList(String, List<String>): void
+ updateILFAndEIFData(String, JSONObject, int): void
+ deleteTransaction(String): void
+ buildTree(Folder, JSONObject): void
+ addTree(String, Folder): void
+ getTree(String): Folder
+ addFile(String, String, String): void
+ reName(String, String, String): void
VAFService
- vafDAO: VAFDAO
+ add(String, vaf): void
+ change(String, vaf): void
ManagerDAO
- mongoTemplate: MongoTemplate
+ add(Manager): void
+ delete(String): void
+ getAll(): List<Manager>
DescriptionDAO
- mongoTemplate: MongoTemplate
+ add(String, Description): void
RequirementDAO
- mongoTemplate: MongoTemplate
+ add(Requirement): void
+ getRequirement(String): Requirement
+ getAllRequirementsByUser(String): List<Requirement>
+ getAllRequirements(): List<Requirement>
+ deleteRequirement(String): void
+ changeStatus(String, String): void
+ changeStatusAndRemark(String, String, String): void
+ checkIdentity(String, String): void
+ updateTableOfILF(String, List<FileTable>): void
+ updateTableOfEIF(String, List<FileTable>): void
+ updateTableOfeFD(String, List<EstimationFileData>): void
ResultDAO
- mongoTemplate: MongoTemplate
- transactionDAO: TransactionDAO
- requirementDAO: RequirementDAO
+ updateResult(String, String, List<EstimationFileData>, List<EstimationTransactionData>): void
+ getReport(String): void
TransactionDAO
- mongoTemplate: MongoTemplate
+ add(String, Transaction): void
+ addTree(String, Foler): void
+ updateTransaction(String, List<String>): void
+ getTransaction(String, String): void
+ getTree(String): void
+ deleteTransaction(String, String): void
+ reName(String, String, String): void
VAFDAO
- mongoTemplate: MongoTemplate
+ add(String, VAF): void
+ change(String, VAF): void
Description
- projectName: String
- projectDescription: String
- projectLeader: String
- projectContact: String
- estimationMethod: String
+ method(type): type
Requirement
- id: String
- userId: String
- description: Description
- transactions: List<Transaction>
- state: String
- createTime: String
- remark: String
- UFP: int
- AFP: double
- workTime: double
- treeOfTransactions: Folder
- originalVAF: VAF
- newVAF: VAF
- workCost: double
- allEIFData: List<FileTable>
- allILFData: List<FileTable>
- eFDs: List<EstimationFileData>
Manager
- id: String
- username: String
+ method(type): type
File
- id: String
- name: String
+ method(type): type
Foler
- id: String
- childFolders: List<Folder>
- childFiles: List<Folder>
+ method(type): type
FileTable
- fileName: String
- allDET: String
+ method(type): type
Transaction
- id: String
- transactionName: String
- steps: List<Step>
- eTDs: List<EstimationTransactionData>
+ method(type): type
Step
- stepName: String
- eifDataSets: List<EIFDataSet>
- ilfDataSets: List<ILFDataSet>
+ method(type): type
EIFDataSet
- EIFName: String
- DET: List<String>
+ method(type): type
ILFDataSet
- ILFName: String
- DET: List<String>
+ method(type): type
VAF
- developmentType: String
- developmentPlatform: String
- languageType: String
- DBMS_Used: String
- RELY: String
- CPLX: String
- TIME: String
- SCED: String
- productivity: String
- cost: String
+ method(type): type

Our class is divided into four levels, the bottom is an entity class, the second layer is the data access classes, and the third layer is the business logic classes, the top layer is the controller class.

Description

estimation.bean

The Description instance in the system. It contains the information about the project.

Fields

Modifier and Type	Field	Description
private String	projectName	The name of the project
private String	projectDescription	The description of the project
private String	projectLeader	The lead of the project
private String	projectContact	The way of contact with the leader
private String	estimationMethod	The method of the estimation

EIFDataSet

estimation.bean

The EIFDataSet instance in the system. It contains the data about external interface file.

Fields

Modifier and Type	Field	Description
private String	ExternalInterfaceFileName	The name of file
private List	DET	Data Element Types

Methods

> getExternalInterfaceFileName

- *public String getExternalInterfaceFileName()*

Get External Interface File name.

returns

External Interface File name

parameters

none

> setExternalInterfaceFileName

- *public void setExternalInterfaceFileName(String externalInterfaceFileName)*

Set the External Interface File name.

returns

void

parameters

-externalInterfaceFileName: file's name

> getDET

- *public List getDET()*

Get Data Element Types.

returns

Data Element Types

parameters

none

> setDET

- *public void setDET(List dET)*

Set the Data Element Types.

returns

void

parameters

-dET: Data Element Types list

EstimationFileData

estimation.bean

The estimation file instance in the system. It contains the information in the report about data function table.

Fields

Modifier and Type	Field	Description
private String	name	The name of the project
private String	FileType	The type of the file
private String	RET	Record Element Types
private String	DET	Data Element Types
private int	RETNum	The number of RET
private int	DETNum	The number of DET
private String	Complexity	The complexity about project
private int	UFP	Unadjusted function points

EstimationTransactionData

estimation.bean

The estimation file instance in the system. It contains the information in the report about transaction function table.

Fields

Modifier and Type	Field	Description
private String	name	The name of the project
private String	TransactionType	The type of the file
private String	LogicalFile	ILF and EIF
private String	DET	Data Element Types
private int	FileNum	The number of file
private int	DETNum	The number of DET
private String	Complexity	The complexity about project
private int	UFP	Unadjusted function points

File

estimation.bean

The File instance in the system.

Fields

Modifier and Type	Field	Description
private String	name	The name of file
private String	id	The id of file

Methods

> getName

- *public String getName()*

Get File name.

returns

File name

parameters

none

> setName

- *public void setName(String name)*

Set the File name.

returns

void

parameters

-name: file's name

> getDET

- *public String getId()*

Get file id.

returns

File id

parameters

none

> setId

- *public void setId(String id)*

Set the file id.

returns

void

parameters

-id: File's id

FileTable

estimation.bean

The Filetable instance in the system.

Fields

Modifier and Type	Field	Description
private String	fileName	The name of file
private String	allDET	All Data Element Types

Constructors

> FileTable()

Generate the student instance by default value.

parameters none

Methods

> setFileName

- *public void setFileName(String fileName)*

Set File name.

returns

void

parameters

-fileName: file's name

> setAllDET

- *public void setAllDET(String allDET)*

Set all det.

returns

void

parameters

-allDET: All Data Element Types

Folder

estimation.bean

The Folder instance in the system.

Fields

Modifier and Type	Field	Description
private String	name	The name of folder
private String	id	Folder id
private List	childFolders	the child folders
private List	childFiles	the child files

Methods

> getName

- *public String getName()*

Get folder name.

returns

folder name

parameters

none

> setName

- *public void setName(String name)*

Set folder name.

returns

void

parameters

name: folder name.

> getId

- *public String getId()*

Get folder id.

returns

folder id

parameters

none

> setId

- *public void setId(String id)*

Set folder id.

returns

void

parameters

id: folder id.

> getChildFolders

- *public List getChildFolders()*

Get its child folders.

returns

child folder lists

parameters

none

> setChildFolders

- *public void setChildFolders(List childFolders)*

Set child folders.

returns

void

parameters

childFolders: child folders list.

> getChildFiles

- *public List getChildFiles()*

Get its child files.

returns

child file lists

parameters

none

> setChildFiles

- *public void setChildFiles(List childFiles)*

Set child files.

returns

void

parameters

childFolders: child files list.

ILFDataSet

estimation.bean

The ILFDataSet instance in the system. It contains the data about Inner logical File.

Fields

Modifier and Type	Field	Description
private String	InnerlogicalFileName	The name of file
private List	DET	Data Element Types

Methods

> getInnerlogicalFileNameName

- *public String getInnerlogicFileName()*

Get Inner logical File name.

returns

Inner logical File name

parameters

none

> setInnerlogicalFileName

- *public void setInnerlogicalFileName(String innerlogicalFileName)*

Set the Inner logical File name.

returns

void

parameters

-innerlogicalFileName: file's name

> getDET

- *public List getDET()*

Get Data Element Types.

returns

Data Element Types

parameters

none

> setDET

- *public void setDET(List dET)*

Set the Data Element Types.

returns

void

parameters

-dET: Data Element Types list

Manager

estimation.bean

The Manager instance in the system.

Fields

Modifier and Type	Field	Description
private String	id	The id of manager
private String	username	The name of manager

Methods

> getId

- *public String getId()*

Get manager's id.

returns

Manager's id

parameters

none

> setId

- *public void setId(String id)*

Set manager's id.

returns

void

parameters

-id: manager's id

> getUsername

- *public String getUsername()*

Get user name.

returns

manager's user name

parameters

none

> setUsername

- *public void setUsername(String username)*

Set the user name.

returns

void

parameters

-username: User's name

Requirement

estimation.bean

The Requirement instance in the system.

Fields

Modifier and Type	Field	Description
private String	id	The task id
private String	userId	The user id
private Description	description	The description of project
private List	transactions	transactions list
private Folder	treeOfTransactions	tree of transactions
private VAF	originalVAF	Original adjustment factor values
private VAF	newVAF	New adjustment factor values
private String	state	the task's state
private String	createTime	the task's create time
private String	remark	the task's remark
private int	UFP	Unadjusted function points
private double	AFP	Adjusted function points
private double	workTime	project's worktime
private double	workCost	project's workcost
private List	allEIFData	all external interface file data
private List	allILFData	all inner logic file data
private List	estimationFileDatas	EstimationFileData list

RET

estimation.bean

The RET instance in the system. Record Element Types.

Fields

Modifier and Type	Field	Description
private String	RETName	The name of RET
private String	RETField	The field of RET

Step

estimation.bean

The Step instance in the system.

Fields

Modifier and Type	Field	Description
private String	stepName	The name of Step
private List	eifDataSets	The data about EIF
private List	ilfDataSets	The data about ILF

Methods

> setStepName

- *public void setStepName(String stepName)*

Set stepName.

returns

void

parameters

-stepName: step's name

> setEifDataSets

- *public void setEifDataSets(List eifDataSets)*

Set EIF sataSets.

returns

void

parameters

-eifDataSets: eifDataSets list

> setIlfDataSets

- *public void setIlfDataSets(List ilfDataSets)*

Set ILF sataSets.

returns

void

parameters

-ilfDataSets: ilfDataSets list

VAF

estimation.service

the adjustment factor instance of a requirement.

Fields

Modifier and Type	Field	Description
private String	developmentType	the developmentType of project
private String	developmentPlatform	the developmentPlatformof project
private String	languageType	the languageType of project
private String	DBMS_Used	the DBMS_Used of project
private String	RELY	the RELY of project
private String	CPLX	the CPLX of project
private String	TIME	the TIME of project
private String	SCED	the SCED of project
private String	productivity	the productivity of project
private String	cost	the cost of project

Transaction

estimation.service

A transaction(File) of the function decomposition tree in a requirement.

Fields

Modifier and Type	Field	Description
private String	id	the id of a task
private String	transactionName	the name of a transcation
private List	steps	thelist of steps of transaction
private List	estimationTransactionDatas	the list of estimation transaction datas

DescriptionService

estimation.service

The description service in the system.

Fields

Modifier and Type	Field	Description
private DescriptionDAO	descriptionDAO	using for the description of the CURD of estimation task to the database

Constructors

> Student(int id)

Generate the student instance by student's id.

parameters -id: the id of the student

Methods

> add

- *public void add(String id, Description description)*

add the description by id

returns

void

parameters

-id: description id

-description: the description of a estimation task

throws

GeneralExpection

> getName

- *public String getName()*
- *public String getName(int type)*

Get the student name.

returns

the student name

parameters

-type: 0:full name; 1: first name 2: family name

throws

GeneralExpection

ManagerService

estimation.service

The manager service in the system.

Fields

Modifier and Type	Field	Description
ManagerDAO	managerDAO	the operation of the manager to estimate the estimation task

Methods

> judgeIdentity

- public Boolean judgeIdentity(String username)

Judge the user's identity

returns

true or false

parameters

-username: the name of user

> add

- public Boolean add(String username)

add manager

returns

true or false

parameters

-username: the name of user

> delete

- public Boolean delete(String username)

delete manager

returns

true or false

parameters

-username: the name of user

> getAll

- public List getAll()

get the list of all managers

returns

the list of all managers

parameters

none

RequirementService

estimation.service

The requirement service in the system.

Fields

Modifier and Type	Field	Description
private RequirementDAO	requirementDAO	data connect about requrement

Methods

> add

- public String add(String userId)

add a estimation task

returns

a task id

parameters

-userId: the id of user

> getRequirement

- public Requirement getRequirement(String id)

get a requirement of the addition of a estimaion task

returns

a requirement instance

parameters

-id: the id of task

> getAllRequirementsByUser

- public List getAllRequirementsByUser(String userId)

get the list of all requirements by userId

returns

the list of all requirements

parameters

-userId: the id of user

> getAllRequirements

- public List getAllRequirements()

get the list of all requirements

returns

the list of all managers

parameters

none

> deleteRequirement

- public void deleteRequirement(String id)

delete a requirement

returns

none

parameters

-id: the task id

> changeState

- public void changeState(String id, String state, String remark)

change the state and remark of the estimation task

returns

none

parameters

-id: the task id

-state: the state of the estimation task

-remark: the remark of change

> getAccount

- public String getAccount(HttpServletRequest request)

get the id of user from token and judge the login status of user

returns

the id of user

parameters

-HttpServletRequest request: Front-end request

> changeStatus

- public void changeStatus(String id, String status)

change the status of the estimation task only

returns

none

parameters

-id:the task id

-status: the status of task

> checkIdentity

- public boolean checkIdentity(String id, String userId)

judge whether the user has the permission

returns

none

parameters

-id:the task id

-userId: the id of user

ResultService

estimation.service

The result service in the system.

Fields

Modifier and Type	Field	Description
private ResultDAO	resultDAO	data connect about result
private int[]	UFPLevel1 = {5,7,10}	UFPLevel1
private int[]	UFPLevel2 = {7,10,15}	UFPLevel2
private int[]	UFPLevel3 = {3,4,6}	UFPLevel3
private int[]	UFPLevel4 = {4,5,7}	UFPLevel4
private int[]	UFPLevel	
private String[]	complexityLevel = {"低","中","高"}	complexityLevel
private VAFState	vafState = new VAFState()	

Methods

> updateResult

- public Transaction updateResult(String id, String tId, List eFDs, List eTDs)

update the result

returns

a transaction

parameters

-id: task id

-tId: transcation id

-eFDs: a list of estimation file data

-eTDs:a list of estimation transaction data

> calFileComplexity

- public void calFileComplexity(EstimationFileData eFD)

calculate the complexity of file

returns

none

parameters

-eFD: estimation file data

> calFileUFP

- private void calFileUFP(int level1, int level2, int level3, EstimationFileData eFD)

calculate the UFP level of file

returns

none

parameters

-level1:UFPLevel1 = {5,7,10}

-level2:UFPLevel2 = {7,10,15}

-level3:UFPLevel3 = {3,4,6}

-eFD: estimation file data

> calTransactionComplexity

- public void calTransactionComplexity(EstimationTransactionData eTD)

calculate the complexity of transaction

returns

none

parameters

-eTD: estimation transaction data

> calTransactionUTF

- private void calTransactionUTF(int level1, int level2, int level3, EstimationTransactionData eTD)

calculate the UTF level of transaction

returns

none

parameters

-level1:UTELevel1

-level2:UTFLevel2

-level3:UTFPLevel3

-eTD: estimation transaction data

> getReport

- public Requirement getReport(String id)

get the report of a estimation task

returns

a requirement

parameters

-id: task id

> CalVAF

- private double CalVAF(VAF vaf)

calculate the VAF

returns

iVAF

parameters

-vaf:a VAF instance, adjustment factor values

> getState

- public VAFState getState(Requirement requirement)

get the state of VAF

returns

the state of vaf

parameters

-requirement:the requirement of a task

> judge

- private boolean judge(String a, String b)

judge the string a and string b

returns

true or false

parameters

-a:a string

-b:a string

TransactionService

estimation.service

The transaction service in the system.

Fields

Modifier and Type	Field	Description
private TransactionDAO	transactionDAO	data connect about result
private RequirementDAO	requirementDAO	data connect about requrement

Methods

> add

- public void add(String id, Transaction transaction)

add one transcation

returns

none

parameters

-id: task id

-transaction: a transcation instance

> deleteArray

- public void deleteArray(String id, String key)

Delete the key as the key array object, which keys will be deleted

returns

none

parameters

-id: task id

-key: in the name of transaction instance

> getAllTransactions

- public List getAllTransactions(String id)

get all the transaction information of a requirement

returns

a list of transaction of one requirement

parameters

-id: task id

> buildTree

- public void buildTree(Folder parent, JSONObject jsonObject)

build the father note of a directory tree

returns

none

parameters

-parent: father note

-jsonObject: a jsonObject instance , include the information of a directory tree

> addTree

- public void addTree(String id, Folder tree)

add a note to a directory tree

returns

none

parameters

-id: task id

-tree:father note

> addFile

- public void addFile(String id, String name, String tId)

add file to the tree

returns

none

parameters

-id: task id

-name:file name

-tId: transaction id

> geTransaction

- public Transaction geTransaction(String id, String tId)

get the transaction of a task

returns

transaction instance

parameters

-id: task id

-tId: transaction id

> deleteTransaction

- public void deleteTransaction(String id, String tId)

delete a transacation of a task

returns

none

parameters

-id: task id

-tId: transaction id

> reName

- public void reName(String id, String tId, String tName)

rename a transaction

returns

none

parameters

-id: task id

-tId: transaction id

-tName: transaction name

> updateTransactionList

- public void updateTransactionList(String id, List tIds)

update the transaction list of a task

returns

none

parameters

-id: task id

-tIds: list of transaction id

> updateILFAndEIFData

- public void updateILFAndEIFData(String id, JSONArray jsonArray, int flag)

update the ILF and EIF data

returns

none

parameters

-id: task id

-jsonArray:

-flag: to judge ILF or EIF

> updateETDs

- public void updateETDs(String id,String tId, List eTDs)

update the list of estimation transaction data

returns

none

parameters

-id: task id

-tId: transaction id

-eTDs: list of estimation transaction data

VAFService

estimation.service

The VAF service in the system.

Fields

Modifier and Type	Field	Description
private VAFDao	vafDAO	data connect about VAF

Methods

> add

- *public void add(String id, VAF vaf)*

add a VAF

returns

void

parameters

-id: task id

-vaf: a VAF instance, value of adjustment factors

> change

- *public void change(String id,VAF vaf)*

adjust the VAF

returns

void

parameters

-id: task id

-vaf: a VAF instance, value of adjustment factors

VAFState

estimation.service

a instance about the state of VAF

Fields

Modifier and Type	Field	Description
private boolean	developmentTypeState	the value of developmentTypeState
private boolean	developmentPlatformState	the value of developmentPlatformState
private boolean	languageTypeState	the value of languageTypeState
private boolean	DBMS_UsedState	the value of DBMS_UsedState
private boolean	RELYState	the value of RELYState
private boolean	CPLXState	the value of CPLXState
private boolean	TIMEState	the value of TIMEState
private boolean	SCEDState	the value of SCEDState
private boolean	productivityState	the value of productivityState
private boolean	costState	the value of costState

Methods

> isDevelopmentTypeState

- *public boolean isDevelopmentTypeState()*

Determine whether to choose the development type

returns

true or false

parameters

none

> setDevelopmentTypeState

- *public void setDevelopmentTypeState(boolean developmentTypeState)*

set the state of DevelopmentType

returns

none

parameters

-developmentTypeState:whether to choose the development type,true or false

> isDevelopmentPlatformState

- *public boolean isDevelopmentPlatformState()*

Determine whether to choose the DevelopmentPlatform

returns

none

parameters

none

> setDevelopmentPlatformState

- *public void setDevelopmentPlatformState(boolean developmentPlatformState)*

set the state of DevelopmentPlatform

returns

none

parameters

-developmentPlatformState:whether to choose the DevelopmentPlatform,true or false

> isLanguageTypeState()

- public boolean isLanguageTypeState()

Determine whether to choose the LanguageType

returns

true or false

parameters

none

> setLanguageTypeState

- *public void setLanguageTypeState(boolean languageTypeState)*

set the state of LanguageType

returns

none

parameters

-languageTypeState: whether to choose the LanguageType ,true or false

> isDBMS_UsedState()

- public boolean isDBMS_UsedState()

Determine whether to choose the DBMS_Used

returns

true or false

parameters

none

> setDBMS_UsedState

- *public void setDBMS_UsedState(boolean dBMS_UsedState)*

set the state of DBMS_Used

returns

none

parameters

-dBMS_UsedState: whether to choose theDBMS_Used ,true or false

> isRELYState()

- public boolean isRELYState()

Determine whether to choose the RELY

returns

true or false

parameters

none

> setRELYState

- *public void setRELYState(boolean rELYState)*

set the state of RELY

returns

none

parameters

-rELYState: whether to choose the RELY ,true or false

> isTIMEState()

- public boolean isTIMEState()

Determine whether to choose the TIME

returns

true or false

parameters

none

> setTIMEState

- public void setTIMEState(boolean TIMEState)

set the state of TIME

returns

none

parameters

-TIMEState: whether to choose the TIME ,true or false\

> setSCEDState

- public void setSCEDState(boolean sCEDState)

set the state of SCED

returns

none

parameters

-sCEDState: whether to choose the SCED ,true or false

> setProductivityState

- public void setProductivityState(boolean productivityState)

set the state of Productivity

returns

none

parameters

-productivityState: whether to choose the Productivity ,true or false

> setCostState

- public void setCostState(boolean costState) set the state of Cost

returns

none

parameters

-costState: whether to choose the Cost ,true or false

DescriptionController

estimation.controller

Connect with front-end about description.

Fields

Modifier and Type	Field	Description
private DescriptionService	descriptionService	business logic in description
private RequirementService	requirementService	business logic in requirement

Methods

> add

- *public void addDescription(HttpServletRequest request, @RequestBody JSONObject jsonObject, @PathVariable String id)*

Add the Description.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains description

-id: task's id

ManagerController

estimation.controller

Connect with front-end about manager.

Fields

Modifier and Type	Field	Description
private ManagerService	managerService	business logic in manager
private RequirementService	requirementService	business logic in requirement

Methods

> judgeIdentity

- *public Object judgeIdentity(HttpServletRequest request)*

Judge the user identity.

returns

Judging result

parameters

-request: HttpServletRequest, to get user name.

> addManager

- *public Object addManager(@RequestBody JSONObject jsonObject)*

Add the manager.

returns

Adding result

parameters

-jsonObject: it contains manager's username.

> deleteManager

- *public Object deleteManager(@RequestBody JSONObject jsonObject)*

Delete the manager.

returns

Deleting result

parameters

-jsonObject: it contains manager's username.

> getAll

- *public Object getAll()*

Get all the managers.

returns

Getting result

parameters

none

RequirementController

estimation.controller

Connect with front-end about requirement.

Fields

Modifier and Type	Field	Description
private ManagerService	managerService	business logic in manager
private RequirementService	requirementService	business logic in requirement

Methods

> addRequirement

- *public String addRequirement(HttpServletRequest request)*

Add the requirement.

returns

Task Id

parameters

-request: HttpServletRequest, to get user id.

> getRequirement

- *public Requirement getRequirement(HttpServletRequest request, @PathVariable String id)*

Get the requirement.

returns

a requirement instance

parameters

-request: HttpServletRequest, to get user id.

-id: task id

> getAllRequirementsByUser

- *public List getAllRequirementsByUser(HttpServletRequest request)*

Get all requirements by user id.

returns

requirement list

parameters

-request: HttpServletRequest, to get user id.

> getAllRequirements

- *public List getAllRequirements(HttpServletRequest request)*

Get all requirements.

returns

requirement list

parameters

-request: HttpServletRequest, to get user id.

> deleteRequirement

- *public void deleteRequirement(HttpServletRequest request, @PathVariable String id)*

Delete the requirement.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-id: task id

> changeState

- *public void changeState(HttpServletRequest request, @RequestBody JSONObject jsonObject,@PathVariable String id)*

Change the task state

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "state" and "remark"

-id: task id

ResultController

estimation.controller

Connect with front-end about result.

Fields

Modifier and Type	Field	Description
private ResultService	resultService	business logic in result
private ManagerService	managerService	business logic in manager
private RequirementService	requirementService	business logic in requirement

Methods

> updateResult

- *public Object updateResult(HttpServletRequest request, @RequestBody JSONObject jsonObject, @PathVariable String id)*

Update the result.

returns

updating message

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "eTDs", "eFDs", "tId",

-id: task's id

> getReport

- *public JSONObject getReport(HttpServletRequest request, @PathVariable String id)*

Get the IFPUG report.

returns

requirement in json format

parameters

-request: HttpServletRequest, to get user id.

-id: task's id

VAFController

estimation.controller

Connect with front-end about VAF.

Fields

Modifier and Type	Field	Description
private VAFService	VAFService	business logic in VAF
private ManagerService	managerService	business logic in manager
private RequirementService	requirementService	business logic in requirement

Methods

> addVAF

- *public void addVAF(HttpServletRequest request, @RequestBody JSONObject jsonObject, @PathVariable String id)*

Add the adjustment factor values.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "developmentType", "developmentPlatform", "languageType", "DBMS_Used", "RELY", "CPLX", "TIME", "SCED", "productivity", "cost".

-id: task's id

> changeVAF

- *public Object changeVAF(HttpServletRequest request, @RequestBody JSONObject jsonObject, @PathVariable String id)*

Update the adjustment factor values.

returns

updating message

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "developmentType", "developmentPlatform", "languageType", "DBMS_Used", "RELY", "CPLX", "TIME", "SCED", "productivity", "cost".

-id: task's id

TransactionController

estimation.controller

Connect with front-end about Transaction.

Fields

Modifier and Type	Field	Description
private TransactionService	transactionService	business logic in transaction
private ManagerService	managerService	business logic in manager
private RequirementService	requirementService	business logic in requirement

Methods

> addTransaction

- *public void addTransaction(HttpServletRequest request, @RequestBody JSONObject jsonObject, @PathVariable String id)*

Add the transaction.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "transactionName", "tId", "steps".

-id: task's id

> addAllTree

- *public void addAllTree(HttpServletRequest request, @RequestBody JSONObject jsonObject, @PathVariable String id)*

Add the all transaction tree.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "tree"

-id: task's id

> getTree

- *public Object getTree(HttpServletRequest request, @PathVariable String id)*

Get the transaction tree.

returns

Tree in json format

parameters

-request: HttpServletRequest, to get user id.

-id: task's id

> addFile

- *public void addFile(HttpServletRequest request, @RequestBody JSONObject jsonObject, @PathVariable String id)*

Add the file.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "name", "id", "tree"

-id: task's id

> geTransaction

- *public Object geTransaction(HttpServletRequest request, @RequestBody JSONObject jsonObject,@PathVariable String id)*

Get the transaction.

returns

transaction information in son format

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "tId"

-id: task's id

> updateTransaction

- *public void updateTransaction(HttpServletRequest request, @RequestBody JSONObject jsonObject,@PathVariable String id)*

Update the transaction.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "tId", "ILFTable", "EIFTable"

-id: task's id

> deleteTransaction

- *public void deleteTransaction(HttpServletRequest request, @RequestBody JSONObject jsonObject,@PathVariable String id)*

Delete the transaction.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "tId"

-id: task's id

> TransactionReName

- *public void TransactionReName(HttpServletRequest request, @RequestBody JSONObject jsonObject,@PathVariable String id)*

Update the transaction's name.

returns

void

parameters

-request: HttpServletRequest, to get user id.

-jsonObject: it contains "tId", "tName"

-id: task's id

DescriptionDAO

estimation.DAO

Data connect about description.

Fields

Modifier and Type	Field	Description
private MongoTemplate	mongoTemplate	mongoDB connect interface

Methods

> add

- *public void add(String id, Description description)*

Add the description by id.

returns

void

parameters

-id: task id

-description: project description

ManagerDAO

estimation.DAO

Data connect about manager.

Fields

Modifier and Type	Field	Description
private MongoTemplate	mongoTemplate	mongoDB connect interface

Methods

> add

- *public void add(Manager manager)*

Add manager.

returns

void

parameters

-manager: a manager instance

> delete

- *public void delete(String username)*

Delete manager.

returns

void

parameters

-username: manager's name

> getAll

- *public List getAll()*

Get all managers.

returns

List

parameters

none

RequirementDAO

estimation.DAO

Data connect about requirement.

Fields

Modifier and Type	Field	Description
private MongoTemplate	mongoTemplate	mongoDB connect interface

Methods

> add

- *public void add(Requirement requirement)*

Add requirement.

returns

void

parameters

-requirement: a requirement instance

> getRequirement

- *public Requirement getRequirement(String id)*

Get requirement by id.

returns

a requirement instance

parameters

-id: task id

> getAllRequirementsByUser

- *public List getAllRequirementsByUser(String userId)*

Get all requirements by user ID.

returns

List

parameters

-userId: user's id

> getAllRequirements

- *public List getAllRequirements()*

Get all requirements.

returns

List

parameters

none

> deleteRequirement

- *public void deleteRequirement(String id)*

Delete requirement by its name.

returns

void

parameters

-id:task id

> changeStateAndRemark

- *public void changeStateAndRemark(String id, String state, String remark)*

Update requirement's state and mark by its id.

returns

void

parameters

-id:task id

-state:requirement's state

-remark:requirement's remark

> changeStatus

- *public void changeStatus(String id, String status)*

Update requirement's state.

returns

void

parameters

-id:task id

-state:requirement's state

> checkIdentity

- *public boolean checkIdentity(String id, String userId)*

Check user's identity about one requirement.

returns

boolean

parameters

-id:task id

-userId:user's id

> updateTableOfILF

- *public void updateTableOfILF(String id, List fileTables)*

Update table of ILF.

returns

void

parameters

-id:task id

-fileTables:data in ILF tables

> updateTableOfEIF

- *public void updateTableOfILF(String id, List fileTables)*

Update table of EIF.

returns

void

parameters

-id:task id

-fileTables:data in EIF tables

> updateTableOfeFD

- *public void updateTableOfILF(String id, List fileTables)*

Update table of eFD.

returns

void

parameters

-id:task id

-fileTables:data in eFD tables

ResultDAO

estimation.DAO

Data connect about result.

Fields

Modifier and Type	Field	Description
private TransactionDAO	transactionDAO	data connect about transaction
private RequirementDAO	requirementDAO	data connect about requirement
private MongoTemplate	mongoTemplate	mongoDB connect interface

Methods

> UpdateResult

- *public Transaction UpdateResult(String id, String tId, List eFDs, List eTDs)*

update the result.

returns

a Transaction instance

parameters

-id: task id

-tId: the transaction instance

-eFDs: estimation file data list

-eTDs: estimation transaction data list

> getReport

- *public Requirement getReport(String id)*

Get the IFPUG report.

returns

a requirement instance

parameters

-id: task's id

TransactionDAO

estimation.DAO

Data connect about transaction(the function of the directory tree).

Fields

Modifier and Type	Field	Description
private MongoTemplate	mongoTemplate	mongoDB connect interface

Methods

> add

- *public void add(String id, Transaction transaction)*

add one transaction.

returns

void

parameters

-id: task id

-transaction: a transaction instance

> deleteArray

- *public void deleteArray(String id, String key)*

Delete the Array by task id and key. The array contains some transactions.

returns

void

parameters

-id: task's id

-key:

> addTree

- *public void addTree(String id, Folder tree)*

Add the tree of transactions.

returns

void

parameters

-id: task's id

> updateTransaction

- *public void updateTransaction(String id, List tIds)*

update the transactions by tIds.

returns

void

parameters

-id: task's id

-tIds: transactions‘ id

> geTransaction

- *public Transaction geTransaction(String id, String tId)*

Get the transactions by tIds.

returns

a Transaction instance

parameters

-id: task's id

-tId: transaction‘ id

> getTree

- *public Folder getTree(String id)*

Get the transactions trees.

returns

a Folder instance

parameters

-id: task's id

> deleteTransaction

- *public void deleteTransaction(String id, String tId)*

Delete the transaction by tId.

returns

void

parameters

-id: task's id

-tId: transaction‘ id

> reName

- *public void reName(String id, String tId, String tName)*

Rename the transaction.

returns

void

parameters

-id: task's id

-tId: transaction‘ id

-tName: transaction‘ name

> updateETDs

- *public void updateETDs(String id, String tId, List eTDs)*

Update the estimation transaction data.

returns

void

parameters

-id: task's id

-tId: transaction‘ id

-eTDs: estimation transaction data list

VAFDAO

estimation.DAO

Data connect about VAF.

Fields

Modifier and Type	Field	Description
private MongoTemplate	mongoTemplate	mongoDB connect interface

Methods

> add

- *public void add(String id, VAF vaf)*

Add the VAF by id.

returns

void

parameters

-id: task id

-vaf: a VAF instance, including all adjustment factor values

> change

- *public void change(String id, VAF vaf)*

Update the VAF by id.

returns

void

parameters

-id: task id

-vaf: a VAF instance, including all adjustment factor values
