



FIT5042 Design Report (Major Tasks)

Banking Enterprise Application

Sung-Che Lee:28872401

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1. Overview

This is a web-based banking enterprise application. The function provided is as below.

Public user:

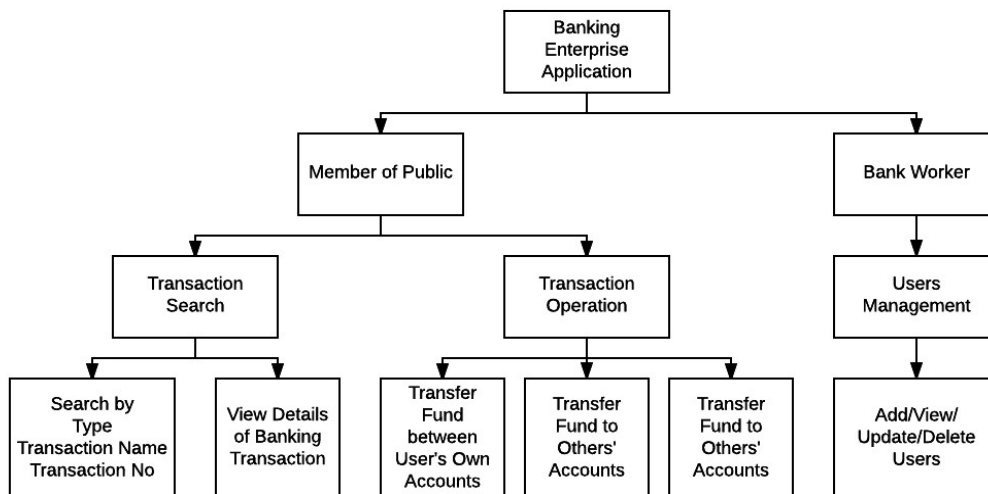
- A. Search for a banking transaction by type, banking transaction number and banking transaction name. The search result is shown in tabular format and another option is provided for user to view the full details of a transaction.
- B. Operate a banking transaction including fund transfer and deposit. The transaction information is stored in the database and can be viewed by above function.

Bank worker:

- A. Manage users including add, view, edit and delete both public users and bank workers.

I adopt Java enterprise technologies to implement the system, such as JSF, Persistence API, EJB, container managed entity manager, input validation, Criteria API and JPQL.

2. Functional diagram

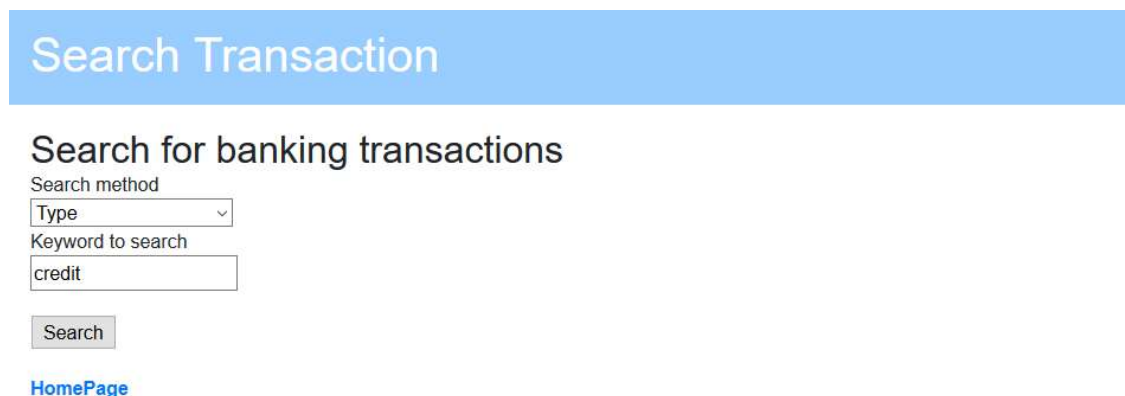


3. Core program functionality

This banking enterprise application provides users with a web client implemented in JSF. Some input validations are adopted to keep user input correct. Each web page has a corresponded controller which is completed by the request scoped managed bean. Two session scoped managed bean are used to store data shared by different web pages. One is for public user functionalities and the other is for bank worker ones.

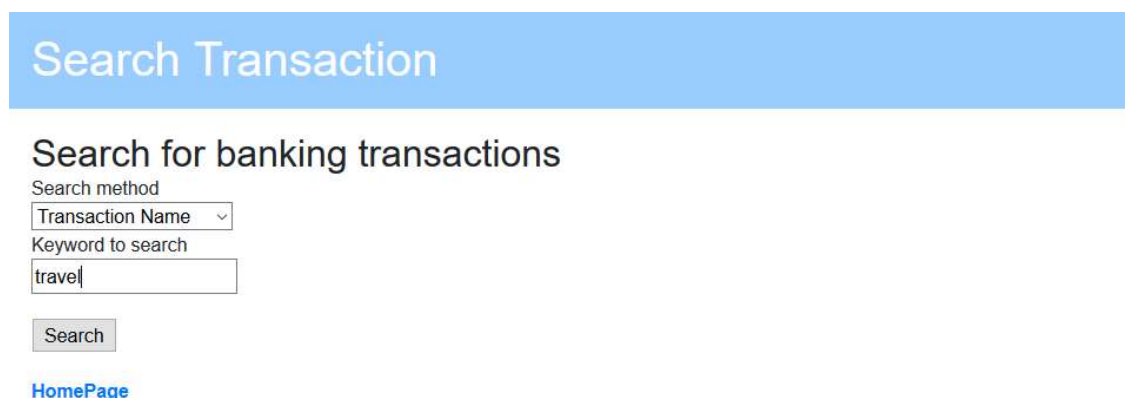
A member of public can use the transaction search function. It can be performed by the following methods.

- Type: Search by transaction type, e.g. credit or debit (Figure 1)
- Transaction Name: Search by transaction name, e.g. travel (Figure 2)
- Transaction Number: Search by transaction number, e.g. 3 (Figure 3)



The screenshot shows a web page titled "Search Transaction" with a light blue header. Below the header, the text "Search for banking transactions" is displayed. Underneath, there is a "Search method" dropdown menu currently set to "Type". Below the dropdown is a text input field labeled "Keyword to search" containing the word "credit". A "Search" button is positioned below the input field. At the bottom left, there is a link labeled "HomePage".

Figure 1



The screenshot shows the same "Search Transaction" web page. In this instance, the "Search method" dropdown menu is set to "Transaction Name". The "Keyword to search" text input field now contains the word "travel". The "Search" button and the "HomePage" link remain in the same positions.

Figure 2

Search Transaction

Search for banking transactions

Search method
Transaction Number ▾

Keyword to search
3

Search

[HomePage](#)

Figure 3

Besides, as shown in Figure 4, public user can operate transactions including fund transfer and deposit. Users may have multiple accounts such as classic, saver and reward and they can transfer fund between their own accounts. They can also transfer fund to others' accounts. Furthermore, deposit is another function provided. All above transaction information is stored in the database and can be retrieved by users.

Operate Transaction

User ID: 1
These are all your banking accounts.

Number	Type	Balance	Transfer fund	Deposit
1	classic	1000	Transfer fund	Deposit
3	reward	3000	Transfer fund	Deposit
2	saver	2000	Transfer fund	Deposit

[Back](#)
[HomePage](#)

Figure. 4

On the other hand, user management function is provided for bank works. The database of both public users and bank workers can be added, viewed, edited and deleted, as shown in Figure 5.

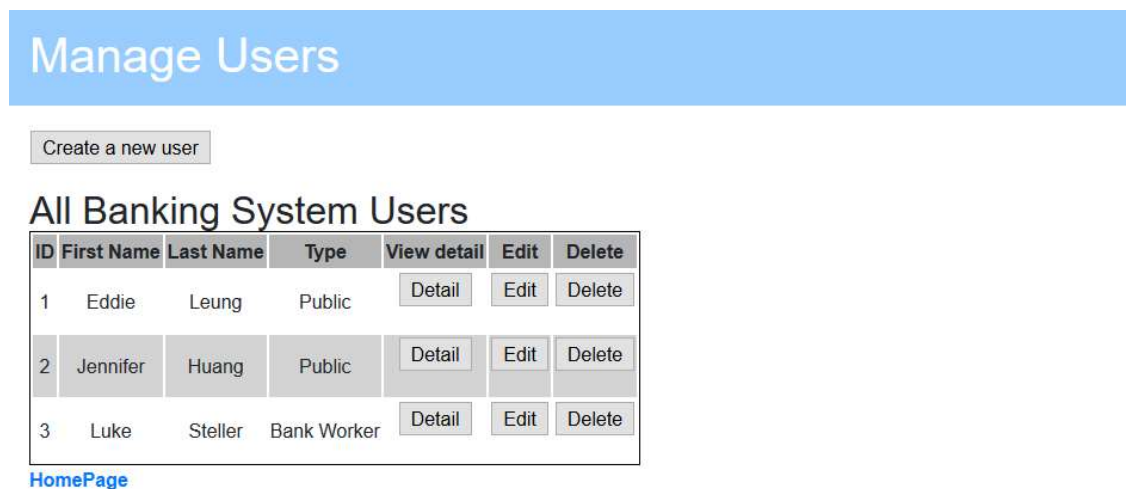


Figure. 5

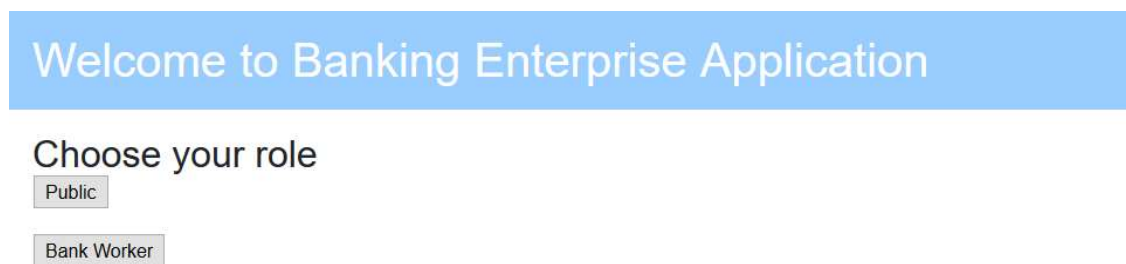
All business logic functions are implemented by EJB, such as search function. Both Criteria API and JPQL are used for data retrieval. Besides, container managed entity manger is adopted to handle entities.

Persistence API provides interface for accessing, persisting and managing data in a common project which can be shared by other projects. Three entities are created to store banking system user, banking transaction data and banking account.

4. Usability Design Review

4.1 Home page

- Provide selection of different roles on this page



4.2 Public user home page

- Public user can easily choose the service on this page.

Welcome to Public User Home Page

Choose a service

4.2.1 Search transaction service

- Users can search for banking transactions on this page. It provides a dropdown list to easily choose a search method, and a text area to typing the keyword. Then simply click the “Search” button to begin searching.

Search Transaction

Search for banking transactions

Search method

Keyword to search

[HomePage](#)

Transaction result

- Tabular format is shown on this page.
- Each transaction provides a “Detail” link to view the full detail.
- “Back” and “HomePage” link is shown at the bottom to easily navigate. The whole web side has this feature.

Transaction Result

Number	Name	View detail
2	salary	Detail
4	salary	Detail

[Back](#)[HomePage](#)

Transaction detail

- Transaction detail is listed in a table.
- “Back” and “HomePage” link is shown at the bottom to easily navigate.

Transaction Detail

Transaction number	2
Transaction name	salary
Type	Credit
Description	Aug 2017
Amount	3000

[Back](#)[HomePage](#)

4.2.2 Transaction operation service

- Users can type user ID for individual transaction operation. Then simply click the “Start Transaction” button to begin.

Operate Transaction

Operate banking transactions

Type your user ID

[HomePage](#)

Individual transaction operation page

- All user accounts with tabular format are shown on this page.
- Each account provides “Transfer fund” and “Deposit” function buttons.

Operate Transaction

User ID: 1

These are all your banking accounts.

Number	Type	Balance	Transfer fund	Deposit
1	classic	1000	Transfer fund	Deposit
3	reward	3000	Transfer fund	Deposit
2	saver	2000	Transfer fund	Deposit

[Back](#)

[HomePage](#)

4.2.2.1 Transfer fund

- Original balance is shown with the account number.
- Users can transfer fund to their own accounts or others' accounts. Just simply type the destination account number.
- Fill in the form and click "Save" button to start.

Transfer Fund

User ID: 1

You can transfer fund to the account of yours or others.

From account (Account number - Balance)

1 - \$ 1000

To account (Account number)

2

Banking transaction name

dinner

Description

internal transfer

Amount

20

Are you sure you want to transfer the fund?

Save

[Back](#)

[HomePage](#)

Transfer fund result

- Fund transfer result is displayed after the operation.
- Amount, from account and to account are shown on this page.
- More transaction operation link is provided.

Transaction Result

The transaction is successful.

You have transferred \$20 from Account:1 to Account:2

[Operate more transactions](#)

[HomePage](#)

Transfer fund result in transaction detail

- Fund transfer detail can be found when searching transactions.

Transaction Detail

Transaction number	5
Transaction name	dinner
Type	Debit
Description	internal transfer
Amount	20

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[HomePage](#)

4.2.2.2 Deposit

- Original balance is shown with the account number.
- Users can deposit money to the account they selected.
- Fill in the form and click “Save” button to start.

Deposit

User ID: 1

You can deposit to the account you selected.

To account (Account number - Balance)

1 - \$ 980

Banking transaction name

tips

Description

working

Amount

50

Are you sure you want to deposit?

Save

[Back](#)

[HomePage](#)

Deposit result

- Deposit result is displayed after the operation.
- Amount and account are shown on this page.
- More transaction operation link is provided.

Deposit Result

The deposit is successful.

You have deposited \$50 to Account:1

[Operate more transactions](#)

[HomePage](#)

Deposit result in transaction detail

- Deposit detail can be found when searching transactions.

Transaction Detail

Transaction number	6
Transaction name	tips
Type	Credit
Description	working
Amount	50

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[HomePage](#)

4.2 Bank worker home page

- Bank worker can easily choose the service on this page.

Welcome to Bank Worker Home Page

Choose a service

[Manage users](#)

4.2.1 User management service

- All banking system users with tabular format are shown on this page.
- Each user can be viewed, edited and deleted by clicking function buttons.
- A new user can be created by clicking “Create a new user” button.

Manage Users

[Create a new user](#)

All Banking System Users

ID	First Name	Last Name	Type	View detail	Edit	Delete
1	Eddie	Leung	Public	Detail	Edit	Delete
2	Jennifer	Huang	Public	Detail	Edit	Delete
3	Luke	Steller	Bank Worker	Detail	Edit	Delete

[HomePage](#)

Create user

- Fill in the form and click “Save” button to start.

Add User

First name

Last Name

Email

Password

Type

Address

Phone Number

See user detail

- User detail is listed in a table.

User Detail

ID	4
First name	Robin
Last name	Lee
Email	robinlee@gmail.com
Password	A11111
Type	Public
Address	9/6-10 Creek Road Mitcham Vic
Phone number	0423610987

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Edit user

- Modify the form and click “Save” button to start.

Edit User

ID	4
First name	<input type="text" value="Robin"/>
Last Name	<input type="text" value="Lee"/>
Email	<input type="text" value="robinlee@gmail.com"/>
Password	<input type="password" value="••••••"/>
Type	<input type="text" value="Public User"/>
Address	<input type="text" value="9/6-10 Creek Road Mitc"/>
Phone Number	<input type="text" value="0423123456"/>

Delete user

- View the user detail and click “Save” button to start.

Delete User

ID	4
First name	Robin
Last name	Lee
Email	robinlee@gmail.com
Password	A11111
Type	Public
Address	9/6-10 Creek Road Mitcham Vlc
Phone number	0423610987

Are you sure you want to delete the user?

[Back](#)
[HomePage](#)

4.3 Input validation

For transaction search service

- Clear message is provided.

Search Transaction

Search for banking transactions

Search method

Type

Keyword to search

You must enter the keyword!

Search

[HomePage](#)

For transaction operation service

- Different validations are used in different columns.

Transfer Fund

User ID: 1

You can transfer fund to the account of yours or others.

From account (Account number - Balance)

1 - \$ 1030

To account (Account number)

You must enter an account number!

Banking transaction name

You must enter a banking transaction name!

Description

You must enter a description!

Amount

0 It must be a number between 1 and 100,000,000!

Are you sure you want to transfer the fund?

Save

For user management service

- Different validations are used in different columns.

Edit User

ID

4

First name

You must enter the first name!

Last Name

You must enter the last name!

Email

robinlee@

Email format is not correct!

Password

You must enter the password!

Type

Public User

Address

You must enter the address!

Phone Number

0423

The lenght should be between 10 and 12!

4.4 Error message**For unsuccessful transaction**

- Clear message is provided.

Transaction Result

The transaction is unsuccessful.

You don't have enough balance!

The account you are transferring to is invalid!

[Operate more transactions](#)

[HomePage](#)

5. Checklist of site functionality

	TICK if complete
1. Credit Functionality	
Search for Transaction by	√
Transaction Name,	√
Transaction No	√
Transaction Type	√
Results with tabular format with heading.	√
Option to view the full details	√
2. Distinction Functionality	
Bank Workers can: View	√
Add	√
Update	√
Delete Users	√
Members of Public can make Transactions	√
3. Technical Requirements	
Credit	√
JSF web clients	√
Persistence API	√
Application managed entity manager or container managed entity manager.	√
Distinction	√
Web client is required	√
Interaction between clients and database handled by EJBs	√
BOTH Criteria API and JPQL	√
Audit	√
No breaking of copyright	√

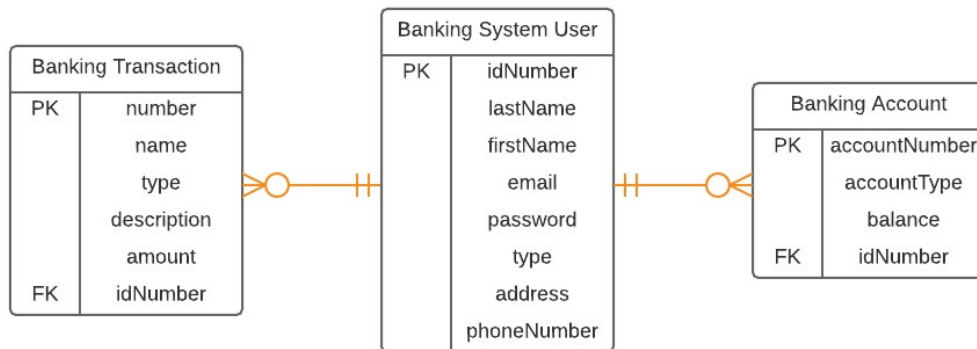
6. User stories

The application provide different services for different roles. Users can select public or bank worker as their roles on the home page.

As members of public, users can search for transactions. After the search result is displayed, they have an option to view full details of each transaction. Besides, they can operate transactions. Fund transfer and deposit are offered in this application.

As bank workers, users can manage both public and bank worker users. Add, view, edit and delete are provided in this application.

7. Entity relation Diagram



8. Data dictionary

Banking System User

Field Name	Data Type	Field Size	Note
idNumber	int	10	PK
lastName	String	255	
firstName	String	255	
email	String	255	
password	String	255	
type	String	255	
address	String	255	
phoneNumber	String	255	

Banking Transaction

Field Name	Data Type	Field Size	Note
bankingTransactionNumber	int	10	PK
bankingTransactionName	String	255	
type	String	255	
description	String	255	
amount	int	10	
idNumber	int	10	FK

Banking Account

Field Name	Data Type	Field Size	Note
accountNumber	int	10	PK
accountType	String	255	
balance	int	10	
idNumber	int	10	FK