Project Report

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A. high level requirements

The aim of this book shop management system is to give basic functions for different kinds of people (manager and clerk) to facilitate their everyday work in the book shop. Through login interface, according to the different identifications of users, manager users or clerk users can enter different interfaces with different function modules.

manager users can access:

1. system setting module: A manager can add new users (manager or clerk) to this system, exit this system and change a user and re-login.

2. stock management module: (1) Check the stock records. (2)Select the lowest price among different suppliers.

3. sale statistics module: (1)check all the sale records (2)check the ranking list of the books. The ranking could be done through different methods.

clerk users can access:

1. system setting module: (1)Exit this system (2)change a user and re-login.

2. Refund module: (1)check if the book sold out is from this

bookshop. (2) refund to storage.

3. Vending function module: (1) show the storage from prime database or reserved database. (2) book inquiry (3) select the book and calculate the total price.

B. Architecture design

1. Components

(1) Client

GUI is written using MFC (Microsoft Foundation Classes)

MFC is a class library provided by Microsoft. It encapsulates Windows Api in the form of C++ classes. The classes inside contain a lot of windows handles classes and windows built-in control tools classes.

(2) Development tool

visual studio 2010

(3)Database management system

Sql server 2008 R2

2. Basic concept of Master/Slaves software architecture and implementation

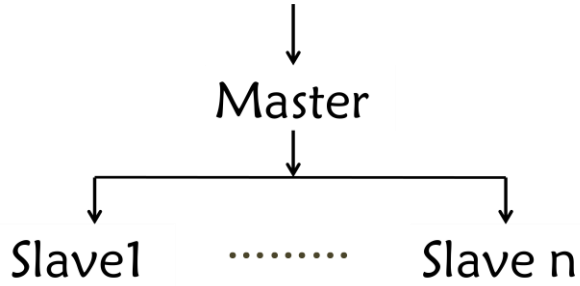

Figure1: Block diagram for master/slaves architecture

Architecture Features:

- The Master/Slaves architecture is a variant of the The Master/Slaves architecture is a variant of the
- main/subroutine architecture style
- It supports fault tolerance and system reliability
- The slaves provide replicated services to the master
- The master selects a particular result among slaves by certain selection strategy
- The slaves may perform the same functional task by dierent algorithms and methods

3. Architectural design

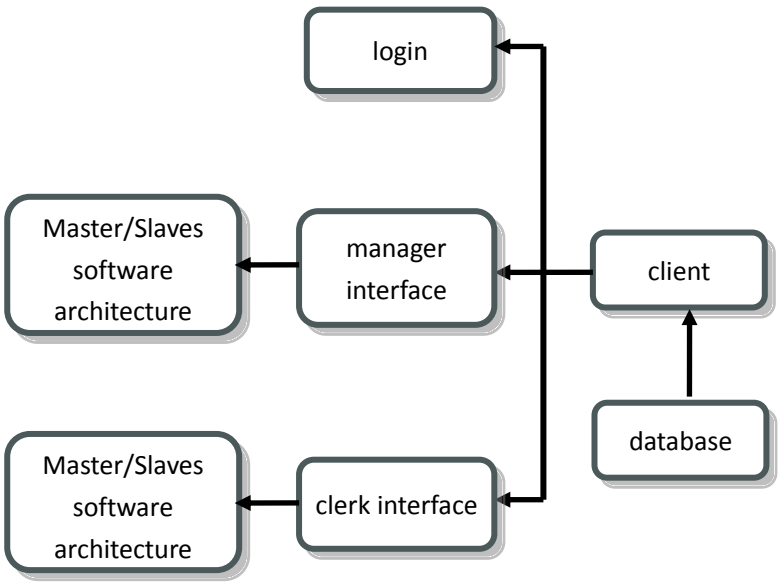

Figure2: Block diagram for architectural design

C. Detailed design

1. Up level modules:

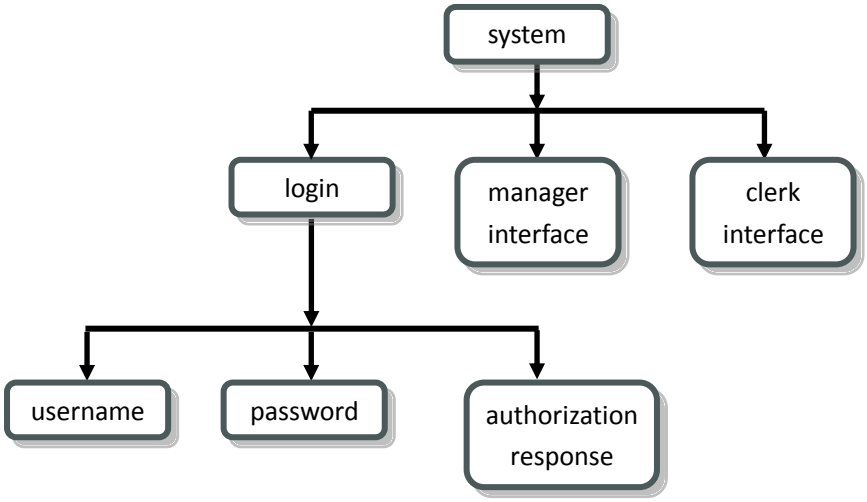

Figure3: Block diagram for up level modules

This system is in hierarchical structure. The system is decomposed into different functional modules and the functional modules at different levels are connected by explicit method invocations. A lower level module provides services to its adjacent upper level modules.

The login module calls username function and password function to get username and password and query in the database to get the authorization response. Then the system calls the login module to get the permission to enter manager interface or clerk interface.

2. manager interface

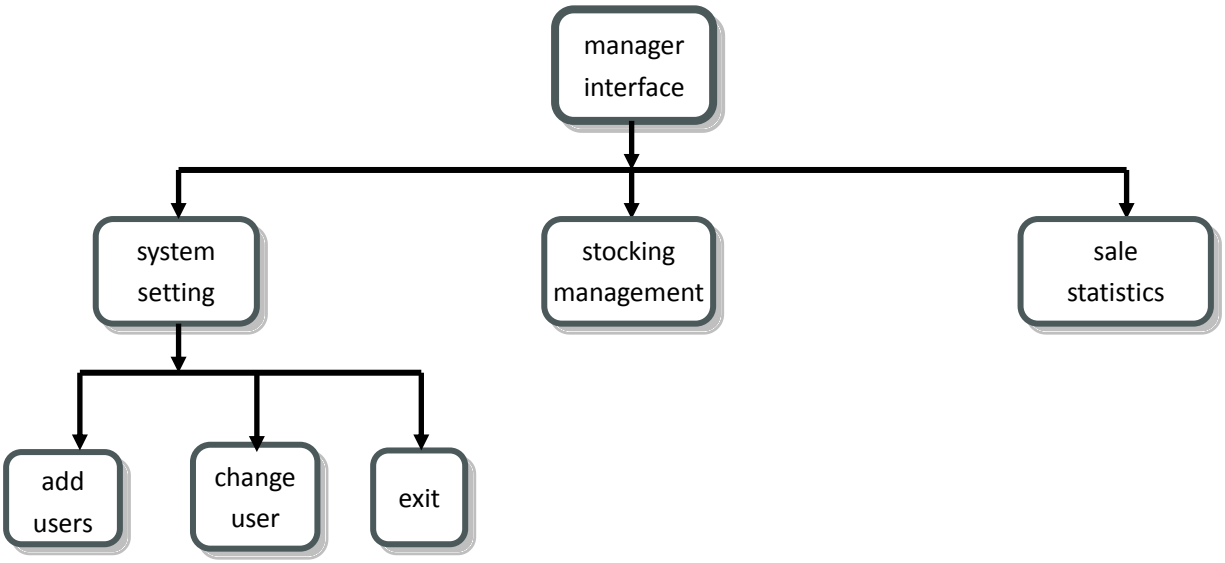

Figure4: Block diagram for manager interface

As a manager user, a manager has unique authorities in the manager interface to enter system setting module, stocking management module and sale statistics module.

3. stocking management module

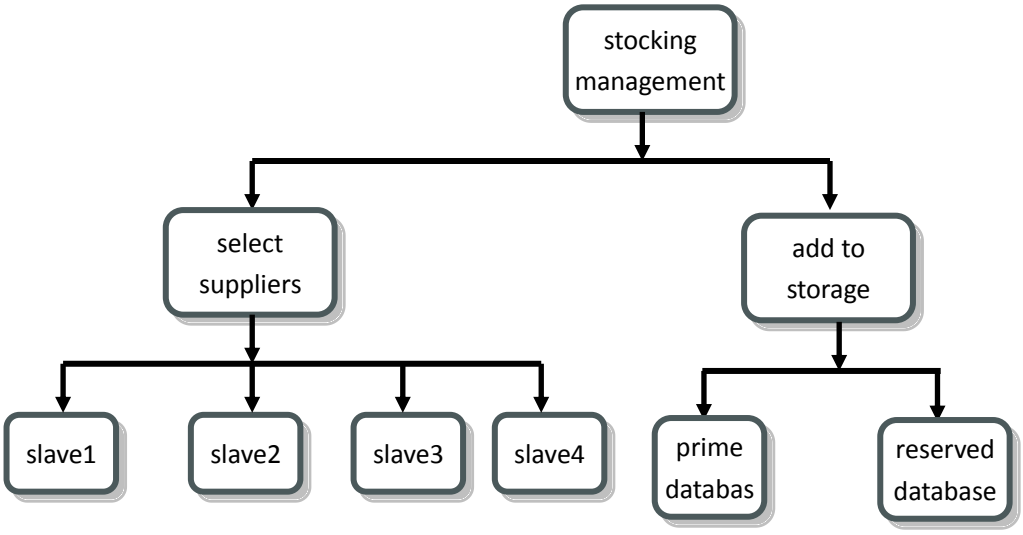

Figure5: Block diagram for stocking management module

This module is a little more complicated and where the features of Master/Slaves architecture are used. In this module, select suppliers module is a master, under which there are 4 slaves that provide replicated services to the master in different methods. In the first 3 slaves, they read supplier records from different databases provided by different suppliers or purchasing agents separately. And in the slave 4, supplier information can be entered through the console in the stocking management interface. After all the records from the 4 slaves are gathered, the master can use a selection strategy to select particular results from the information combined by 4 slaves. The benefit of this architecture is to provide fault tolerance and system reliability.

4. sale statistics module

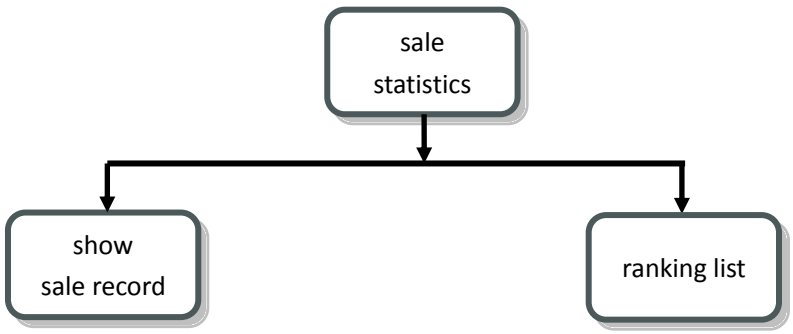

Figure6: Block diagram for sale statistics module

This module is to provide sale statistics function to a manager to monitor the sale records in the past and through the ranking list, a manager can be aware of what kind of books sell the best to give him a suggest to adjust the stoking in the future.

(E) Clerk interface

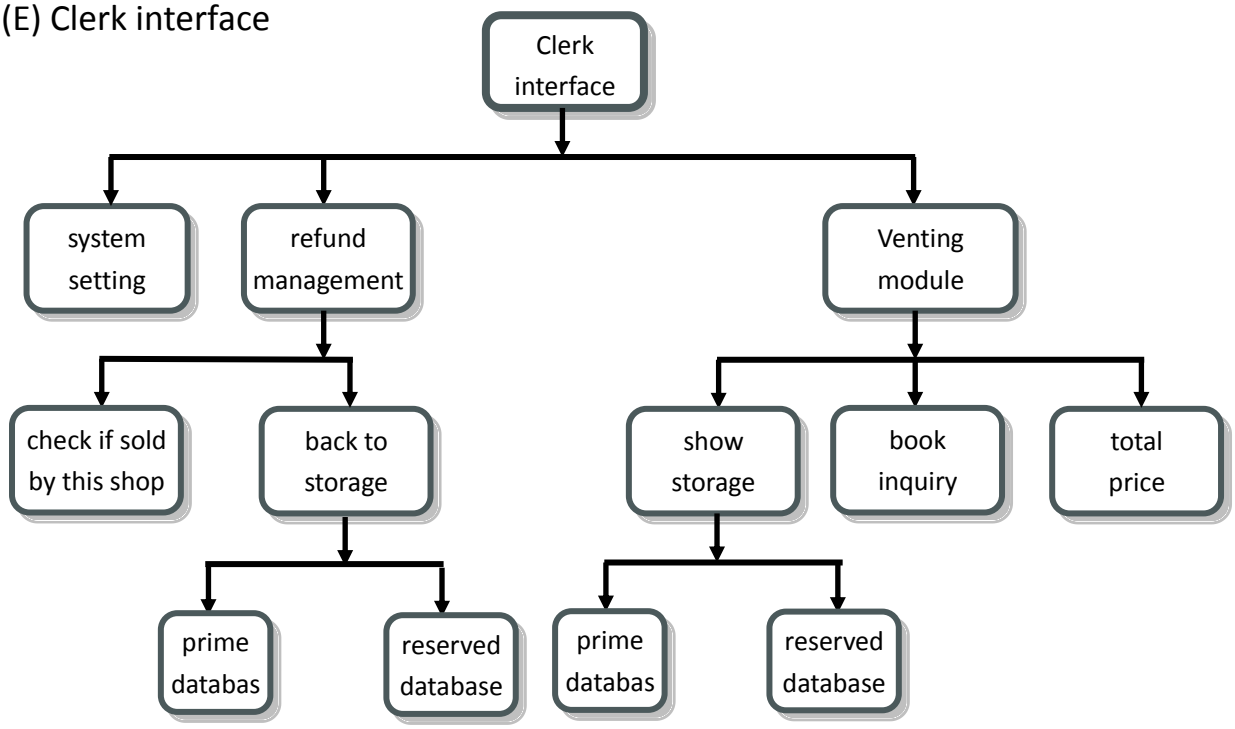

Figure7: Block diagram for clerk interface

In the refund management module, it first check if the books to be returned, given by the customers are sold by this shop by the book number and name. If information match, the book will be return back the storage and the count information of the book will be updated both in the prime database and the reserved database. the venting module simulates a venting machine. It first shows the books available in the book shop from the prime database or reserved database. By default, the records will always be got from the prime database. The book inquiry part gives customer the ability to search a certain book by book name, author or publisher. After total price is paid, the count of the book sold will be updated both in prime database and reserved database.

D. Test

1. Test plan

module and function tests

(1) login interface

Add manager identifications and clerk identifications in the database and input information in compliance with the information of a manager or a clerk in the login interface and see if we can enter the corresponding manager or clerk interface.

(2)manager interface

Enter 3 different modules (system setting, stocking management, sale statistics) one by one and see if every module can be entered and exited.

(a)system setting module

First, in the add users module, add one manager record and one clerk record in the console and see if the username, password and access authority can be stored correctly in the database. Then, test the change user module and exit module.

(b) stocking management module

First, in the 3 different tables in the database, generate some supplier records among which there are records of the same book with the same book number and book name but with different suppliers and prices. In the stocking management interface, use show all suppliers info

button to see if all the information from 4 slaves are submitted to the master. Then, after clicking auto select suppliers button to see if only the books from the suppliers with the lowest price among all the suppliers are selected. Finally, check if all the information of the suppliers selected are inserted in the stocking table and prime and reserved storage table.

(c) sale statistics module

First, check if all the sale records shown are in the sold table in the database. Then check if the ranking list gather all the sale records and the order is right.

(3)clerk interface

(a) refund management module

Select some sold book records in the database, use the matching book information in the refund management interface to see if the book can be returned. After it is returned, see if the count of the book in the prime database and the reserved database are both updated. Finally use book information that doesn't match in the sold table in the database to see if the request of refund will be denied.

(b) venting module

First, see if all the books information stored in the storage table is shown in the console. Then, use some key words to see if the book inquiry function works. Finally, select some books in the purchasing list and see if the count of books that have been bought are updated both in

the prime database and the reserved database.

2. Test report

(1) login interface

No.	Checking Item	Result（Y/N)
1	Enter manager interface	Y
2	Enter clerk interface	Y

(2)manager interface

No.	Checking Item	Result（Y/N)
1	Enter system setting module	Y
2	Enter stocking management module	Y
3	Enter sale statistics modlue	Y

(a)system setting module

No.	Checking Item	Result（Y/N)
1	Manager user information insertion	Y
2	Clerk user information insertion	Y

(b) stocking management module

No.	Checking Item	Result（Y/N)
1	All supplier records shown from 4 slaves	Y
2	Master selection strategy	Y

(c) sale statistics module

No.	Checking Item	Result（Y/N)
1	Sale records	Y
2	Ranking list	Y

(3)clerk interface

(a) refund management module

No.	Checking Item	Result（Y/N)
1	Request from Book information that doesn't match deny	Y
2	Request from book information that matches pass	Y
3	Update both in prime and reserved database	Y

(b) venting module

No.	Checking Item	Result（Y/N)
1	Available books shown from prime database	Y
2	Book inquiry function	Y
3	Update both in prime and reserved database	Y