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**KEMI-TORNIO UNIVERSITY OF APPLIED SCIENCES  
TECHNOLOGY**

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**Design and Implementation of a Web Shop System**

The Bachelor's Thesis in the Degree Programme of Information Technology  
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## **PREFACE**

First of all, I am particularly grateful to my supervisor, Aalto Teppo for instructions contributed to the writing of the thesis and the technical solution. Without his help, this thesis could not have reached its present form.

Secondly, I would like to thank all the teachers for their four years' constructive instruction and innovative ideas giving.

Last but not the least what I want to thank all my friends and my families for their continuous support during my studies here.

## ABSTRACT

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The purpose of this thesis is to design and implement a small web shop for online business. It is designed for consumer who can be shopping at home by a computer, and the seller is able to sell their products and services without the huge amount of maintenance cost for the management and marketing in the real storefront.

The task is simply to establish a Web shop system by analyzing, web user interface designing, database constructing and connecting, testing and implementing. It uses ASP (Active Server Pages), HTML (Hyper Text Markup Language), VBScript, JavaScript for implementing and bases on Microsoft Access for handing the database. The system is divided into front-stage and back-stage management page. Front-stage management is friendly interface for users to browse, inquire. It includes: browse products, check products, order items, view shopping cart, user maintenance and other functions. Back-stage management is available to administrators, it includes: product management, user management, order management and so on. The administrators from the tedious manual operation freed and increase office efficiency. Additionally, the whole research and developing work are based on course materials.

In conclusion, I compared some existing systems (such as ebay). After that, I analyzed and modified my system by following and resolving some real problems and needs from some online shops. During the whole work, I really learned how to work with a project and how to analyze system, gather requirements and solve the problems while you are meeting them.

Keywords: ASP, HTML, Access Database, Design, Implementation.

## TABLE OF CONTENTS

PREFACE.....	I
ABSTRACT.....	II
TABLE OF CONTENTS.....	III
ABBREVIATIONS .....	V
1 INTRODUCTION .....	1
2 INTEGRATED DEVELOPMENT ENVIRONMENTS.....	2
2.1 Web server software.....	2
2.1.1 IIS.....	2
2.1.2 Apache http server .....	2
2.1.3 Hiawatha .....	2
2.1.4 Comparison of web server software.....	3
2.2 Relational database management systems .....	4
2.2.1 Microsoft Access .....	4
2.2.2 MySQL .....	5
2.2.3 PostgreSQL .....	5
2.2.4 Oracle .....	6
2.2.5 Comparison of relational database management systems.....	6
2.3 Programming languages.....	8
2.3.1 PHP .....	9
2.3.2 Ruby.....	9
2.3.3 Python .....	10
2.4 Web application frameworks .....	11
2.4.1 Django.....	11
2.4.2 ASP.net MVC .....	11
2.4.3 Ruby on Rails.....	11
2.4.4 Comparison of web application frameworks .....	11
3 REQUIREMENTS .....	13

3.1	Functional requirements.....	13
3.1.1	Stakeholders .....	13
3.2	Non-functional requirements .....	13
3.2.1	Security .....	13
3.2.2	Usability .....	15
3.2.3	Backup .....	16
3.2.4	Extensibility .....	16
3.3	Structure of database .....	17
4	USER INTERFACE DESIGN .....	20
4.1	Interface window.....	20
4.1.1	Primary window .....	20
4.1.2	Secondary window .....	21
5	IMPLEMENTATION.....	24
5.1	Integrated development environment implementation .....	24
5.2	Create the database tables .....	24
5.3	Database connection .....	25
5.4	Interface implementation .....	26
5.4.1	User Module.....	26
5.4.2	Administrator Module.....	32
6	CONCLUSION .....	36
7	REFERENCES .....	37
8	LIST OF APPENDICES .....	39

## ABBREVIATIONS

ASP	Active Server Page
HTML	Hypertext Markup Language
SQL	Structured Query Language
URL	Uniform Resource Locator
IIS	Internet Information Server
AJAX	Asynchronous JavaScript and XML
XSS	Cross-site Scripting
CSRF	Cross Site Request Forgery
OLE	Object Linking and Embedding
TDD	Test Driven Development
DDE	Dynamic Data Exchange
ORM	Object-relational Mapping
ACL	Access Control List
AJP	Apache JServ Protocol
ODBC	Open Data Base Connectivity
OOAD	Object-Oriented Analysis and Design
GUI	Graphical User Interface
CGI	Common Gateway Interface
MVC	Model-View-Controller
API	Application Programming Interface
RAID	Redundant Array of Independent Disk
HSM	Hierarchical Storage Management
B2C	Business to Consumer
BSD	Berkeley Software Distribution
MIT	Massachusetts Institute of Technology

# 1 INTRODUCTION

Nowadays, online shopping is very popular. It is a shop that sets up on the Internet, a place that can offer the consumer to shopping at home by a computer, and the seller to selling their products and services without the huge maintenance cost for the management and marketing in the real storefront. Virtual stores exist in the Internet, which is the well-known global information network. You can easily enter the virtual store by typing the URL in the web browser.

With the rapid development of Internet, online shopping is changing the way of the traditional consumption patterns. However, how to do business on the internet? The answer is; we need a platform for selling and buying products online.

The purpose of this thesis is planning to build an online shop which is easier to use, more convenient to order product for the consumer, and better to manage the product information for the administrator. It concentrates on system's requirements gathering, user interface design and system implementation.

Firstly, I will introduce and compare some different technologies to build the integrated development environment for a Web shop system. Secondly, I will describe the privileges in term of requirements which define functional and non-functional. In the next chapter, I will show the two main aspects of interface windows in user interface design phase. In the last chapter, I will describe how to implement a Web shop system and what technologies I have chosen to implement for a Web shop system. In this phase, it means that the database will be connected online and all of the functionality will be finally tested and realized.

## **2 INTEGRATED DEVELOPMENT ENVIRONMENTS**

Before the system implementation process for the establishment of an online shop, it is very important to adopt various technologies and tools which are used to implement a Web shop system.

In this chapter are introduced several technologies and tools to built integrated development environment for a Web shop system. After that, it will compare them according to feature, license and so on.

### **2.1 Web server software**

#### **2.1.1 IIS**

Internet Information Services which is for Windows Server, it is a flexible, secure and easy-to-manage Web server for hosting anything on the Web. From media streaming to web application hosting, IIS's scalable and open architecture is ready to handle the most demanding tasks. /1/

#### **2.1.2 Apache http server**

The Apache Http server is an open source web server software which is an established standard in the online distribution of website services, which play a key role in the initial growth of the World Wide Web, it has been developed by an open source community- Apache software Foundation. The server is aimed at serving a great deal of widely popular modern web platforms/operating systems, including Unix, GNU, FreeBSD, Linux, Solaris, Novell NetWare, Mac OS X, Microsoft Windows. It released under the Apache license. /2/

#### **2.1.3 Hiawatha**

Hiawatha started in January 2002 as a very small web server which is an open source with a focus on security. Hiawatha has many security features that no other web server has, like preventing SQL injection, cross-site scripting (XSS), cross-site request forgery (CSRF) prevention, denial-of-service protection, control external image linking, banning of potential hackers and limiting the runtime of CGI applications. /3/



### 2.1.4 Comparison of web server software

**Table 1. Table of Web Server Software**

<b>Server</b>	<b>Apache Http Server</b>	<b>Internet Information Server</b>	<b>Hiawatha</b>
Developed by	Apache Software Foundation	Microsoft	Hugo Leisink
Cost	It is free software	It is not free software, bundled with Windows NT family products	It is free software
Open Source	Apache is characterized as open-source software	No, it isn't	Yes, it is an open source
Software License	Apache License	Non-free/Proprietary	GNU General Public License
Security of Basic Access Authentication	Yes, the server supports Basic Authentication, for password-protected web pages	Yes, the server supports Basic Authentication, for password-protected web pages	Yes, the server supports Basic Authentication, for password-protected web pages
Security of Digest Access Authentication	Yes	Yes	Yes, digest HTTP authentication works with htdigest created password files.
Dynamic content of Java Servlets	No, this server implements AJP; compatible third-party Servlet containers can be integrated to provide seamless Servlet support	No, Servlet Engines are supported via isapi_redirect	No, it is not supported
Dynamic content of ASP.net	Yes, this server can use mod_mono (Multi-platform) or mod_asp.net(win32 only) which will	Yes, IIS receives a request for an ASP.NET web page it passes this request to the ASP.NET	No, it is not supported

	provide ASP.NET support	engine. This engine processes the appropriate web page and returns the HTML content to IIS	
Support in Windows	Yes, the application is available for Microsoft Windows, has been the most popular HTTP server software in use	Yes, is a web server application and set of feature extension modules created by Microsoft for use with Microsoft Windows	Yes, it works a Unix-like environment and command-line interface for Microsoft Windows
Support in Linux	Yes, the application is available for Linux	No, it is not support for Linux	Yes, Hiawatha is a secure web server for Linux
Support in Mac OS X	Yes, the application is available for Mac OS X	No, it is not support for Mac OS X	Yes, the application is available for Mac OS X
Support in Solaris	Yes, the application is available for Solaris	No, it is not support for Solaris	Yes, the application is available for Solaris

In table 1, it shows comparison of web server software according features and operating system support and so on. Apache and IIS are two of the most widely used web server applications in the world. The author of Hiawatha web server was a computer science student. Both of Apache and Hiawatha web server are free, open source, cross-platform software. IIS just works with the Windows operating systems, it is not free. But it works well with other Microsoft applications, IIS has crash protection.

## 2.2 Relational database management systems

### 2.2.1 Microsoft Access

Access is database management system from Microsoft, it is a software-development tools. Advantages of Access:

- Stored in a single way- Access Manager object have tables, queries, forms, reports, pages, macros and modules, all the objects are stored in the suffix (. Mdb) database file, user-friendly to operation and management.
- Access is an object-oriented development tools, use of database management functions encapsulated in various types of objects.
- Access is a visual tool, very intuitive and convenient.  
Access supports ODBC (Open Data Base Connectivity), using Access Powerful DDE (Dynamic Data Exchange) and OLE (object link and embedding) features, can be embedded in a data table, bitmap, sound, Excel tables, Word documents, but also can create dynamic database reports and forms and so on. Access procedures can also be applied to the network, and with the network to link the dynamic data. Database access page object generated using HTML files, easy to build Internet / Intranet applications. /4/

### 2.2.2 MySQL

The MySQL database has consistent fast performance, high reliability and ease of use. So it has become the world's most popular open source database. It is used on every continent; by individual Web developers as well as many of the world's largest and fastest-growing organizations to save time and money powering their high-volume Web sites, business-critical systems and packaged software. /5/

### 2.2.3 PostgreSQL

PostgreSQL is a powerful, open source object-relational database system which is released under and MIT-style license. It has many years of active development and a proven architecture that has earned it a strong reputation for reliability, data integrity, and correctness. /6/

PostgreSQL offers many advantages for company or business over other database systems:

- Immunity to over-deployment.  
Over-deployment is what some proprietary database vendors regard as their #1 licence compliance problem. With PostgreSQL, no-one can sue you for breaking licensing agreements, as there is no associated licensing cost for the software.
- Better support than the proprietary vendors.
- Significant saving on staffing costs.
- Legendary reliability and stability.  
Unlike many proprietary databases, it is extremely common for companies to report that

PostgreSQL has never, crashed for them in several years of high activity operation.

- Cross platform.
- Extensible.
- Designed for high volume environments.
- GUI database design and administration tools.

There are many high-quality GUI Tools available for PostgreSQL from both open source developers and commercial providers. /6/

#### 2.2.4 Oracle

Oracle Database is a relational database management system produced by Oracle Corporation, which is the first database designed for enterprise grid computing, the most flexible and cost effective way to manage information and applications. Enterprise grid computing creates large pools of industry-standard, modular storage and servers. With this architecture, each new system can be rapidly provisioned from the pool of components. There is no need for peak workloads, because capacity can be easily added or reallocated from the resource pools as needed. /7/

The database has logical structures and physical structures. Because the physical and logical structures are separate, the physical storage of data can be managed without affecting the access to logical storage structures. It can store execute stored procedures and functions within itself. /7/

#### 2.2.5 Comparison of relational database management systems

**Table 2. Table of relational database management systems**

<b>RDBMS</b>	<b>Access</b>	<b>MySQL</b>	<b>PostgreSQL</b>	<b>Oracle</b>
Maintainer	Microsoft	Oracle Corporation	PostgreSQL Global Development Group	Oracle Corporation
Software License	Proprietary	Available under the terms of the GNU General Public License, as well as under a variety of	PostgreSQL License(Free and Open Source)	Proprietary

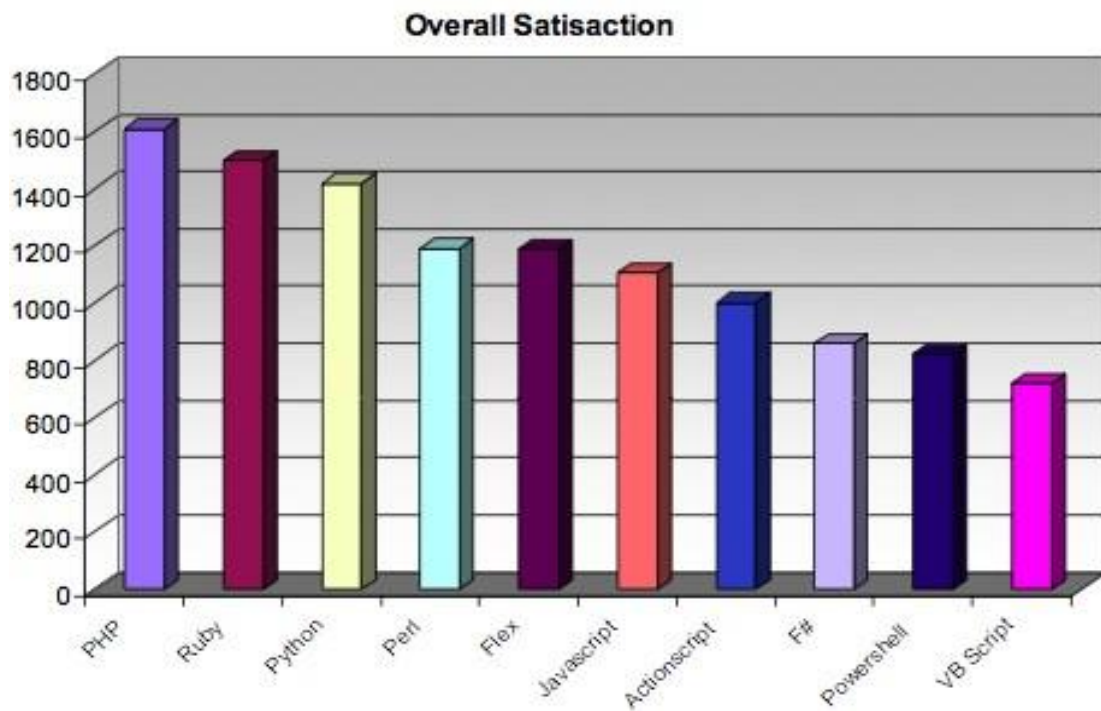
		proprietary agreements		
Speed	It is slowly while transfer data too large	MySQL is fast when concurrent access levels are low, and when there are many more reads than writes	PostgreSQL is relatively slow at low concurrency levels, but scales well with increasing load levels	It is the one of fastest in the many database
Max DB Size	2GB maximum file size on mdb file	Unlimited	Unlimited	Unlimited( 4GB block size per table space)
Max Table Size	2GB	MySAM storage limits: 256 TB; Innodb storage limits:64 TB	32 TB	4 GB block size(with BIGFILE table space)
Type System	Static	Static	Static	Static + Dynamic (through ANYDATA)
Support in Windows	Yes, runs natively on Microsoft Windows	Yes, runs natively on Microsoft Windows	Yes, runs natively on Microsoft Windows since version 8.0.	Yes, support Microsoft Windows: X86, X86-64, Itanium
Support in Linux	No, it is not supported	Yes, in most Linux distributions	Yes, in most Linux distributions	Yes, support Linux: X86, X86-64, PowerPC, zSeries, Itanium
Support in Unix	No, it is not supported	Yes, runs on many Unix-like operating systems	Yes, runs on many Unix-like operating systems	Yes, runs on many Unix-like operating systems
Useable	Small size database	Small to medium sized database	Medium sized database	Very large database

In table 2, it shows comparison of relational database management system from general information, operating system support, limits and so on. For the product cost, Microsoft and Oracle are not free, Access is one of software tools from Microsoft whose software

license is proprietary and Oracle as a commercial product, has a large staff of full time technical writers, so it is very expensive. MySQL and PostgreSQL are free and open source relational database management systems. MySQL has been popular among various software projects because of its speed and ease of use, while PostgreSQL has had a close following from developers who come from an Oracle or SQL Server background.

## 2.3 Programming languages

In figure 1, we can see the result of Evans Data (Evans Data Corporation is a company for market research and strategic planning in the software development industry) published PHP, Ruby and Python are the favorite choices of more than 500 developers and IT Professionals.



**Fig. 1. Overall Satisfaction /8/**

The Evans Data's report is based on the perception of the users of those languages. In this survey, users were asked to rank the languages they use based on different aspects or features (from the survey):

- ease of use
- exception handling
- extensibility

- maintainability / readability
- cross-platform portability
- community
- availability of tools
- quality of tools
- performance
- memory management
- client side scripting
- security /8/

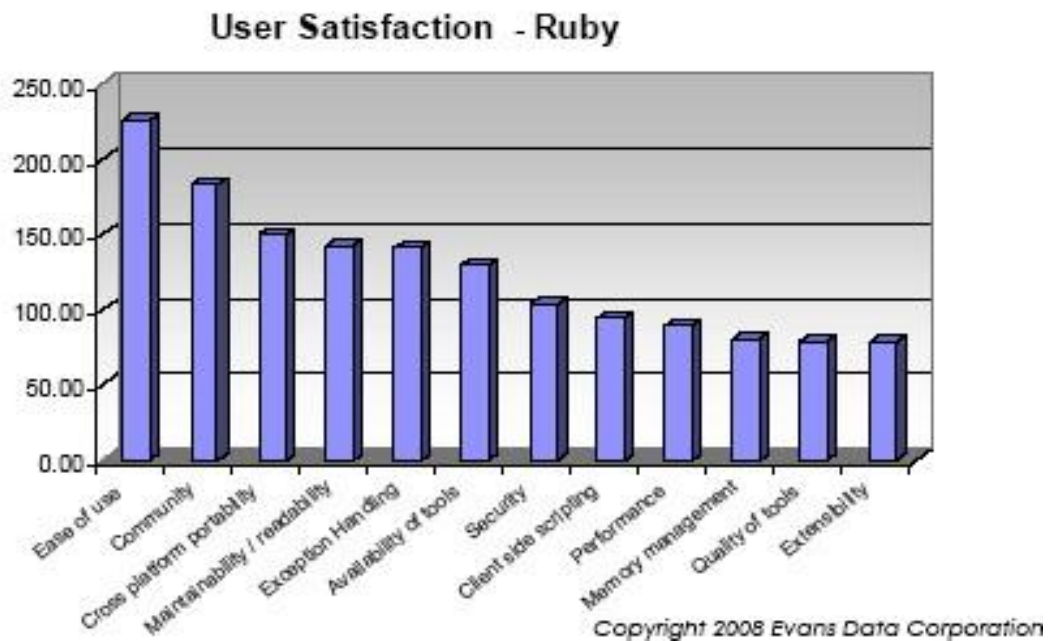
The overall ranking brings PHP, Ruby and Python to the top. The top languages in this study are open source languages and thus evolve in an organic way. The proprietary Microsoft languages, though backed by the software titan and its many resources, did not satisfy their users as well as any of the open source languages. Ease of use is the most important for Ruby and PHP users, while Python users rated extensibility highest. Community is also an important attribute of those three languages with an advantage for Ruby. /8/

### **2.3.1 PHP**

PHP is the most widely accepted and used programming language. That is especially suited for Web development and can be embedded into HTML. Its syntax draws upon C, Java, and Perl, and is easy to learn. The main goal of the language is to allow web developers to write dynamically generated web pages quickly. /9/

### **2.3.2 Ruby**

Ruby is a dynamic, reflective, open source general purpose object-oriented programming language with a focus on simplicity and productivity. It has an elegant syntax that is natural to read and easy to write. /10/



**Fig. 2. User Satisfaction for Ruby /8/**

In figure 2, it is Evans Data's result which shows Ruby appears to be the first for ease of use, community, cross platform portability and maintainability/readability. It also emphasizes the uniform low interest of developers for security.

### 2.3.3 Python

Python is an interpreted and a remarkably powerful dynamic programming language that is used in a wide variety of application domains. Python is often compared to Perl, Ruby or Java. Some of its key distinguishing features include:

- Very clear, readable syntax.
- Strong introspection capabilities.
- Intuitive object orientation.
- Natural expression of procedural code.
- Full modularity, supporting hierarchical packages.
- Exception-based error handling.
- Very high level dynamic data types.
- Extensive standard libraries and third party modules for virtually every task.
- Extensions and modules easily written in C, C++ (or .NET languages for IronPython)
- Embeddable within applications as a scripting interface. /11/



## 2.4 Web application frameworks

### 2.4.1 Django

Django is an open source and a BSD licensed web application framework which allow developers to write high performance, elegant web applications quickly. It was written in Python, it follows the model-view-controller architectural pattern and encourages rapid development and clean, pragmatic design. /12/

### 2.4.2 ASP.net MVC

ASP.NET MVC is a part of the ASP.NET Web application framework that implements the model-view-controller pattern. It was written in C#. It is one of the two different programming models you can use to create ASP.NET Web applications, the other being ASP.NET Web Forms. /13/

ASP.NET MVC brings the power of this development paradigm to ASP.NET development, allowing you to use your .NET development skills to build MVC applications. It gives you:

- Complete control over your HTML Markup.
- Enables rich AJAX and jQuery integration.
- Allows you to create SEO-friendly URLs for your site.
- Makes Test Driven Development (TDD) easy. /13/

### 2.4.3 Ruby on Rails

Ruby on rails is an open source web application framework for Ruby programming language. It uses the Model-View-Controller (MVC) architecture pattern to organize application programming. That's optimized for programmer happiness and sustainable productivity. It can be write beautiful code by favoring convention over configuration. /14/

### 2.4.4 Comparison of web application frameworks

**Table 3. Table of web application framework**

<b>Project</b>	<b>ASP.net MVC</b>	<b>Django</b>	<b>Ruby on rails</b>
License	Microsoft Public License	BSD	MIT/Ruby
Language	ASP.net	Python	Ruby
Ajax	Yes, it enhanced interactivity and responsiveness	Django uses jquery in the admin, but is jsagnostic in the user templates	Prototype, script aculo, us, jQuery
MVC framework	Yes, it implements MVC pattern	Full Stack	ActiveRecord, Action Pack
MVC Push/Pull	Push	Push	Push
ORM	ORM-independent	Django ORM	ActiveRecord
Testing framework	Unit Tests	Yes	Unit Tests, Functional tests and Integration Tests
Security framework	ASP.net forms Authentication	ACL-based	Plug-in
Template framework	Pluggable (default is WebForms)	Django Template Language	Yes
Caching framework	Yes, caching framework	Yes, caching framework	Yes, caching framework
Form validation framework	Yes (client-side via plugins)	Django forms API	Yes

Table 3 shows comparison of web application framework for their architectures and features and so on. These three web application framework follow similar a push-based architecture which use actions that do the required processing, and then “push” the data to the view layer to get in the results. But it is different in language, different web application framework tools depend on which programming language to use.

### **3 REQUIREMENTS**

In this chapter are introduced the requirements of a Web shop. It separates into functional requirements and non-functional requirements. In the non-functional requirements part, it analyzes the security of data security, information security and network security, usability, backup and extensibility of a Web shop system. And after that, I will show the structure of database at end of this chapter.

#### **3.1 Functional requirements**

Functional requirements capture the intended behavior of the system. This behavior may be expressed as services, tasks or functions the system is required to perform. /15/

##### **3.1.1 Stakeholders**

Stakeholders are people who have a stake in a software project. Any person affected by the system or who influence on system development is a stakeholder. In a Web shop system, there are two main groups of stakeholders. First are customers, including unregistered customers. It could be any other people who are interested in shop when viewing our website. The second group are administrators who the main actors in a Web shop system. They are those who will be sitting in front of the server, receiving information and orders from the users and updating database. They are also in charge of web maintenance, as are the salesperson and warehouse. /16/

#### **3.2 Non-functional requirements**

Non-functional requirements are usually called qualities of a system. Such as security and backup.

##### **3.2.1 Security**

In electronic commerce, security is a core issue that must be considered. Viruses and hacking are threatening e-commerce, thus requiring the network to provide a security

solution. Including encryption, signature scheme, distributed security management, access control, firewall, secure Web servers, anti-virus protection.

The security of network system is divided into data security, information security and network security.

### 3.2.1.1 Data Security

The damage of the hard drive is one of threat factors for data security. A hard drive physical damage means loss of data. Loss of equipment operation, storage media failure, operating environment and the human destruction, these can be caused by hard disk drives affected. In order to ensure data security, redundant arrays of inexpensive disks, hierarchical storage management can solve it.

Redundant Arrays of Inexpensive Disks is called RAID. It uses more than one type, capacity, interface or regular hard drive connected into an array as well as makes it faster, accurate and safe to achieve the data read speed and security. There are eight single RAID levels, which are used to varying degrees in the real world today. Some few levels, especially RAID 0, RAID 1 and RAID 5, are extremely popular, while a couple are rarely if ever seen in modern systems. /17/

The Web shop system needs to keep working for 24x7 with handling of capital flow, so that it is very important to secure the date accurately and safely. If the data is lost, the economic loss will be huge. RAID 1 is implemented as mirroring; a drive has its data duplicated on two different drives using either a hardware RAID controller or software (generally via the operating system). If either drive fails, the other continues to function as a single drive until the failed drive is replaced. Conceptually simple, RAID 1 is popular for those who require fault tolerance at low cost and don't need top-notch read performance. Especially useful in situations where the perception is having a duplicated set of data is more secure than using parity. /17/

Hierarchical storage management is called HSM. Storage devices by the online and offline storage devices to work together to form a coordinated storage system, the system in the online storage and offline storage devices for dynamic management of data, make access to data stored in the high frequency of high-performance data stored in line with higher performance storage devices, and access to data stored in the low frequency of cheaper offline storage devices.

### 3.2.1.2 Information Security

To prevent unregistered users to bypass the registration interface to trade directly into the application system, the Web shop system uses Session object to register verification.

In a Web shop system whose source code will not be passed to the client browser, thus avoiding the abbreviation of the source of plagiarism by others to enhance the security of the program.

In addition, the people who operate the computer are one of the biggest potential threat to information security. That is to say, the administrator can't give out or reset password, change any data without verifying who the information is for, it would let anyone easily to get access to the system.

### 3.2.1.3 Network Security

Network security is a complicated subject, however, it is becoming more and more important as people spend more and more time connected.

In a Web shop system, network security starts from authenticating the user with a user name and password, for authentication, users have to use password with strongly of security, and also need to change it usually. In the code, it should be also prepared for certain attack type such as SQL injection attack. And for instance, automatic generation of user id in the firewall is a good way to prevent attacks.

The Web shop system is a small or medium business. It has a fairly strong firewall to prevent malicious attacks from hacking or some spamming and protect computer networks from attack and subsequent intrusion by restricting the network traffic which can pass through.

The system must use an optional network analyzer or network monitor. This type of electronic test equipment can provide same function with protection of firewall. The system should also be tested well for weaknesses and holes that hackers and intruders could use. There are several applications that can be used for that action, such as openVAS for Linux, Nessus and Yasca for Windows.

## 3.2.2 Usability

Usability is crucial in website development. Because whether you are doing online store or online application, the page for users to make him easy and fun to use is a key; efficient to use, easy to use and consistent interface can help enhance usability.

- Efficient to use.

Most users just simply leave the site and browse or shop elsewhere, so information products like best sellers module can help the customer to notice it, if the online shopping site has product pages, the customer will be sure to see them. But if it lacks of adequate information page for product, or even if it is difficult to quick browser. This is a serious problem, because the product information to help make people's determination to buy.

- Easy to use.

If the system has well structured user manuals, information error message and help facilities, it can be easy to use for users.

- Consistent interfaces.

It has a solely characteristic of the user interface like consistent interfaces enhance usability. Because when a person visits a new Web site, they find in the first place is that they find most of the other sites where they are; they use their experience to understand the meaning of new content. This is called habits. People expect certain things remain the same, such as link colors, logo, web site location, tab navigation behavior.

### **3.2.3 Backup**

Backup is useful in recovering your data in the event of an electronic disaster like hardware failure or a break-in that changes or otherwise damages your data. It copies of all the important computer files kept in another location. So if the database is quite large that has to extract file first. That means, storage is the base of a backup system.

### **3.2.4 Extensibility**

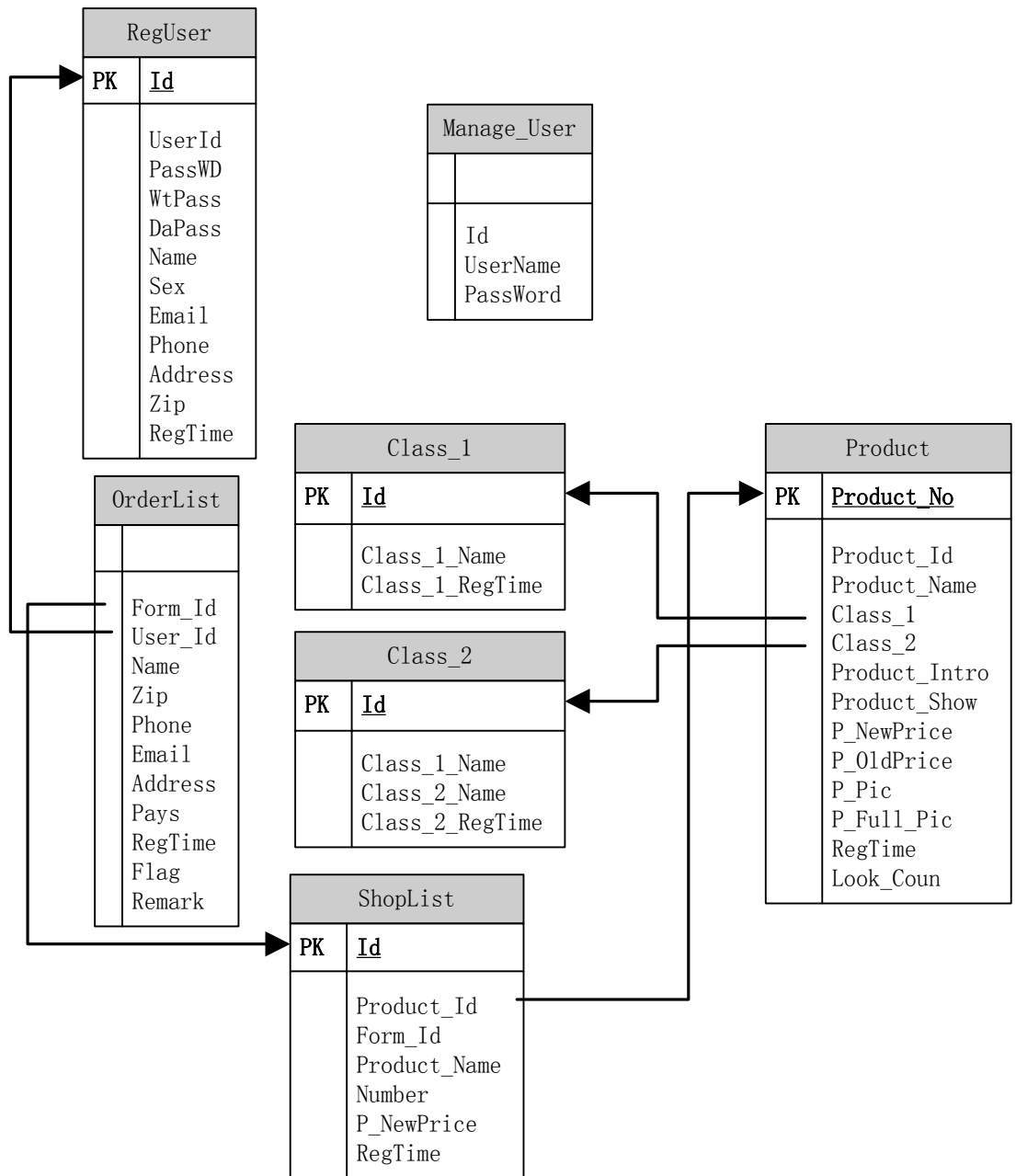
The implementation of a Web shop system takes into consideration future growth, the extensibility of the new network system designed to adapt to the user the ability to future development of enterprises. Such as application extensibility, application functionality in the network configuration on the one hand to fully meet current and foreseeable future applications within a period of time, on the other hand can easily extend the functionality can be flexibly added and functional modules. Like update or add new payment types, the shipping method of different options and so on.

### 3.3 Structure of database

For a good database design, that can accommodate and support all application programs, is the necessary condition for an information system to deliver the intended functionality. The data structures that have persistent presence in the database are modeled as the entity classes and as the relationships between entity classes. The entity classes need to be mapped to the data structures recognized by the database. These data structures vary depending on the underlying database model, which can be object-oriented, object-relational or relational. /18/

When creating database it should be known what should be stored and what is important and how to sort them in different tables. In this Web shop system, the database is not complex. I create 7 tables into it: **Class\_1, Class\_2, Product, OrderList, ShopList, RegUser, Manage\_User.**

Below is the structure of what tables were created for Web Shop system:



**Fig. 3. Database Entity Relationship**

**Class\_1**

It is a table stores category name, which includes Id, Class\_1\_Name and Class\_1\_RegTime. Administrator is able to add, edit and remove the category.

**Class\_2**

It is a table stores sub category name, which includes Id, Class\_1\_Name, Class\_2\_Name and Class\_2\_RegTime. Administrator is able to add, edit and remove the sub category.

**Product**



It is a table stores product detail, which includes Product\_No, Product\_Id, Product\_Name and other product information. User can see the product picture and how many users have been visited this product. Administrator is able to add, edit and remove the product.

**OrderList**

It is a table stores order information, which includes Form\_Id, User\_Id and user's information. From it user can check the order status. Administrator is able to add, edit and remove the order.

**ShopList**

It is a table stores shoplist, which includes Id, Product\_Id, Form\_Id, Product\_Name, Number, P\_NewPrice and RegTime. It shows the information from the shopping cart.

**RegUser**

It is a table stores all user account and more information for user. For every user this is unique userid. At the same time, user can store email, personal information. Administrator is able to add, edit and remove the user account.

**Manage\_User**

It is a table store administration account, which includes the Id, username and password. It is different from RegUser table that admin don't need register.

## 4 USER INTERFACE DESIGN

In the use interface requirements analysis phase, the development of user interfaces begins with early sketches of GUI windows. These sketches are used for requirements gathering, in story-boarding sessions with the users, for prototyping, and for inclusion in the use case documents. The GUI windows for the application are developed to conform to the underlying GUI presentation software and to the peculiarities and constraints of the chosen programming environment during the design. /19/

In this chapter are introduced two main aspects of interface window in the user interface design.

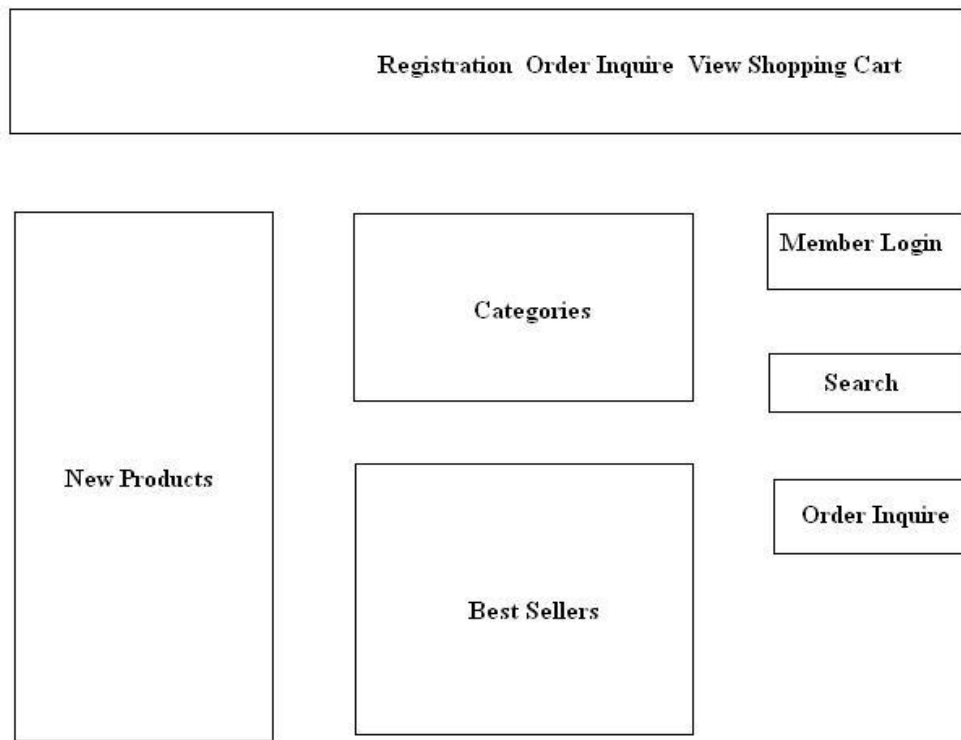
### 4.1 Interface window

There are two main aspects of GUI design which divided into the design of windows and the design of windows' input and editing controls. A typical Windows application consists of a single main application window, the primary window and the secondary window. The primary window is supported by a set of pop-up windows. The secondary window support the user's activities in the primary window. /20/

#### 4.1.1 Primary window

A primary window has a border (frame) is the main window in which user interacts with a document or data. The frame contains a title bar (caption bar) for the window, optionally, a menu bar, toolbars and the window's viewable and modifiable content. /20/

If a web page is used as an entry point of a web application, it can also be treated as special kind of primary window. The user events in web applications are normally programmed through active hyperlinks and action buttons. /21/



**Fig. 4. Web page window of Web Shop**

Figure 4 shows the main page which links to other pages. It includes registration, order inquire and view shopping cart. Users can log in the right behind the control bar which is member's login section. In the middle of main page are categories and best sellers, the categories show the products category and name and best sellers show the popular products. In the left side of main page are the new products.

#### 4.1.2 Secondary window

To the primary window, a secondary window is typically modal with respect. In particular for operations that modify the database such as the insert, delete and update operations, it extends the functionality of the primary window. /22/

A secondary window can be:

- a drop-down list
- a message box /22/

### 4.1.2.1 Drop-down list

A drop-down list provides a pick-list of choices from which the user can select one that applies. That allows the user to choose one value wanted from a list. /23/

In the search part of the interface, the drop-down list to display the menu is seen Figure 5.



**Fig. 5. Menu of Drop-down list**

The following code demonstrates the drop-down list in the Web shop system:

```
<select name='Product_Class' size='1' tabindex='0' class='a' style='font-size: 14px'>
<option value='Computer'>Desktop</option>
<option value='Hardware Peripherals'>CPU</option>
<option value='Network Equipment'>Network Card</option>
<option value='Mobile Digital'>MP3</option>
<option value='Software'>Office Software</option>
</select>
```

### 4.1.2.2 Message box

A message box is a secondary window that displays a message to the user. It contains a system icon, a set of buttons and message can signify a warning, an explanation, an exceptional condition, etc. is seen Figure 6. /23/



**Fig. 6. Message box of Login failed**

The following code demonstrates the message box in the Web shop system:

```
<%=Request.QueryString("msg")%></p>
<TR bgColor=#e6e4c4>
<TD class=main1 width="292" height="27">
<DIV align=center><INPUT class=main type=submit size=3 value=Back name=Submit2
onClick="javascript:window.history.go(-1)">
```

## **5 IMPLEMENTATION**

In this chapter are introduced what technologies have chosen to implement integrated developments environment for a Web shop system and the database table creation. Then it will tell how to connect database by using ASP. During the implementing, each step must be followed in order to get fewer errors would occur.

### **5.1 Integrated development environment implementation**

It was used Internet Information Server combined with ASP and Access database to build an integrated development environment for example in a Web shop system.

It was chosen ASP because it is easy to learn and its development tools are very powerful and various. It is not required to install the dedicated ASP software on the server; there is also no special requirement for the client except a browser. It is a Microsoft technology and program that runs inside IIS, but the weakness is its poor cross-platform, currently only runs on Microsoft's web server.

Internet Information Server is valid for small sites, but also for a large volume of enterprise-class Web site. Currently, IIS only runs on Windows Server. IIS within an integrated search engine allows users with a variety of tools (including ASP, ActiveX Data Objects and SQL database) to create a search form. IIS allows remote management of the server browser, supports multiple virtual hosts. Furthermore, since the introduction of ASP technology, it can easily use it to create dynamic Web pages. This Web shop system uses Windows XP + IIS framework is currently a popular Web server platform for individual, its configuration and development are relatively easy, it is suitable for small enterprise development based B2C e-commerce system.

Access database is a software development tool from Microsoft. Due to the data volume of this Web shop is not much and as an example of my thesis, facilitate to display, it is suitable database for this Web shop system.

### **5.2 Create the database tables**

Create database table must be used on the system of data classification and the specific structural design. It has to be able to adapt to various functions of the system transfer and does not produce structural logic confusion. It ensures that critical data in unexpected situations will not be destroyed.

As well as an entity corresponds to a table, figures out what attributes of the entity, corresponding to what the field, and what kind of contact between the various entities.

This following database table is one of the Web shop. (see Table 4)

**Table 4. Database table of RegUser**

Field	Data Type	Length	Description
Id	int	10	ID number (Primary key)
UserId	int	10	User ID number
PassWD	var	20	Password
WTPass	var	50	Question of password
DAPass	var	50	Answer of password
Name	var	20	User Name
Sex	char	2	User Gender
Email	var	50	Email Address
Phone	char	20	Telephone number
Address	var	100	User address
Zip	var	20	Postcode
RegTime	datetime	50	Register time

### 5.3 Database connection

Generally speaking, a true and complete site is inseparable from the database, because in the practical application, it need to save a lot of data, and often associated with other data, using a database to manage the data, you can easily query and update.

Here, it is a short piece of code as an example to show you how to use ASP to connect database.

```
<%
dim conn
dim connstr
on error resume next
connstr="DBQ="+server.mappath("market_database/supermarket_data.asp")+";DefaultDir
=;DRIVER={Microsoft Access Driver (*.mdb)};"
```

```
set conn=server.createobject("ADODB.CONNECTION")
if err then
err.clear
else
conn.open connstr
if err then
err.clear
end if
end if
%>
```

## 5.4 Interface implementation

The implementation was started by designing the user module and administrator module. Login module is the first step in order to user accounts are able to log. If not, the user can apply to register a new account.

When it comes to the user interface design part, the implementation was started with bars functions like search bar, order inquire and view shopping cart. After the user module is well structured it was started to implement module for administrator which has more function than user module.

### 5.4.1 User Module

#### Member Login

This is the login field where user can type the member name and password to login. The address is: <http://127.0.0.1/webshop/> (see Figure 7)



The screenshot shows a web form titled "Member Login" with a green header. Below the header, there are two input fields: "Member Name:" and "Password:". Below the input fields, there are two buttons: "Login" and "Reset".



### Fig. 7. User module of Login

In figure 7, user login module is the first line of defense to prevent illegal user login, through which you can protect the security of the database. When the user wants to order, the first is to enter the authentication interface, only in the case of correct password it can continue to shopping; if you enter an incorrect password, it can't be ordered.

If he/she enters as a visitor into the site, he/she can only browse and search for goods in general, not to buy, when click added in the shopping cart, the system determines whether the user is already login, if not then get the prompt page that prompts the user must login to order goods, if he/she is the first time, is needed to register first.

If the user enters the correct member number and password, it sets the session variable Session ("LoginSuccess") =1. It will send a header to redirect the user to the default.asp.

The following code demonstrates login validation:

```
Name = Request("UserName")
Pwd  = Request("UserPass")
set Rs = Server.CreateObject("ADODB.recordset")
sql="select * from RegUser where UserId='"&Name&'"and PassWD='"&Pwd&'"
sqltext="select * from Manage_User where UserName='" & Name & "' and PassWord='"
& Pwd & '"
    rs.open sql,conn,1,1
IF  rs.RecordCount >=1 then
Session("LoginSuccess")=rs("UserId")
response.redirect "default.asp"
```

### New Member Registration

If you are not a member then prompt the user for registration.

New Member Registration--

New Member Account:

Account for at least 4, up to 16, use only English letters, digits, "\_"

Register

### Fig. 8. User module of Registration

In figure 8, there is the new member registration where user can type the new member account to register.

After register, user jumps to another window to fill in the rest of member registration information.

When user submitted information, the system begins to determine whether the user's registration information is valid. The first is the user name it can't be empty, the user needs to enter the password twice the same, followed by subsequent users fill out to determine whether the information reach to the requirements, until all the information is correct, the system information is saved to members of the user registration form and prompts the user registered, it can user login, also can be shopping. (see Figure 9 )

Registration Information:	
Your Member Account :	User [This is the name you just selected, if the need to re-select, you can click "Previous" . ]
*Name :	<input type="text"/> [Please leave your real name, for us to contact you and to your shipment.]
*Gender :	<input checked="" type="radio"/> Male <input type="radio"/> Female
*Password :	<input type="text"/> [Your password between 4-16 characters in length. The elements of the password can only be letters, numbers, symbols]
*Password confirmation :	<input type="text"/> [You in the "Confirm Password" box, enter the "Password" the same information, which is to set a password in order to prevent input errors.]
*Password question :	<input type="text"/> [If you forget your password, the system will raise this issue. Select an easy to evoke memories of your question!]
*Password answer :	<input type="text"/> (Forgotten password will verify this answer) [The answer to the problem with the previous correspondence when you forget the password, the system will prompt you to set up here questions and answers to help you reset your password.]
*Email :	<input type="text"/> [Please fill in the correct e-mail address, so that we facilitate contact with you. If you have two or more mail, please fill in only one of your most frequently used email address.]
*Telephone :	<input type="text"/> [Please contact at all times to your phone to your purchases we can contact you at any time.]
*Address :	<input type="text"/> [Please contact at all times to your phone to your purchases we can contact you at any time.]

Fig. 9. Registration Form

In figure 9, in the Gender part of registration form, it is used RadioButton control, it allows the user to choose only one if a predefined of options.

The following code example demonstrates how the RadioButton control to perform set the button of "Gender" button.

```
Type = radio CHECKED value=male name=sex>Male < INPUT id=sex type=radio
value=female name=sex> Female
```

When all the conditions are met, the system record data to database table, and the page display the filled of registration information, the key statement is following:

```
<%
set rs=server.createobject("adodb.recordset")
sqltext="select * from RegUser"
rs.open sqltext,conn,3,3

rs.addnew
rs("UserId")=request.form("uid")
rs("PassWD")=request.form("pwd")
rs("WtPass")=request.form("question")
rs("DaPass")=request.form("answer")
rs("Name")=request.form("Name")
rs("Sex")=request.form("Sex")
rs("Email")=request.form("Email")
rs("Phone")=request.form("usephone")
rs("Address")=request.form("haddr")
rs("Zip")=request.form("postcode")
rs.update
%>
<%
set rs_detail=server.createobject("adodb.recordset")
sqltext2="select * from RegUser where UserId='" & request.form("uid") & "'"
rs_detail.open sqltext2,conn,1,1
%>
```

**Search bar**

Online shopping as a display of goods in the online sales system, how the user can find the fastest which they want to buy, it is very important issue, it also essential to the search bar. This shopping system also did a small module for users to find, users do not have to enter all of name, just enter some key words, then the system can be found all the goods of the information to a web page returned to the user.

**Fig. 10. Search Bar**

In figure 10, bars started to search bar, user can type the product name and choose keyword in the drop-down menu. After then, she/he can click the inquire button or reset it.

The SQL statement is following like:

```
<%
ProductClass_2=request("ProductClass_2")
set rs=server.createobject("adodb.recordset")
sqltext="select * from Product"
if request("Product_Name")<>"" then
sqltext=sqltext &" where Product_Name like '%" & request("Product_Name") &"%' "
else
sqltext=sqltext &" where Product_Name like '%" & "" &"%' "
end if
if request("Product_Class")<>"" then
sqltext=sqltext &" and Class_1 like '%" & request("Product_Class") &"%' "
end if
rs.open sqltext,conn,1,1
%>
```

## Shopping cart

When the user login successful, if found, ordered items, click on items in the bottom of the order, the system will pop up a new page, showing that the item has been added to the shopping cart, then the user need to select the quantity ordered. (see Figure 11)

The following is a list of items you choose

Product Number	Product Name	Product Price	Quantity of Products	Buy	Total
101	IBMThinkPadT2021C	16800	<input type="text" value="1"/>	<input checked="" type="checkbox"/>	16800.00€
					Total price=16800.00€

Confirm Edit    Continue Shopping    Order Cancellation    Go to Checkout

**Fig. 11. List of Shopping Cart**

After clicking the confirmation, the item information is added to the shop list table in background management, if the user needs to continue shopping, you can continue to select, continue to add, the system will automatically list all of the information save to shopping cart, also shows a list of items purchased by the user, and in the total price. If users go to checkout before the purchase of the items have been satisfied, it can choose button of order cancellation, shopping list and the system will delete the relevant information. After users complete the purchase, click on payment, the system returns the final list of items and the total purchase price.

Users once again confirmed, the system displays a successful shopping, prompts the user to check information, including name, address, zip code, email, phone, payment method, and other comments that is automatically extracted from the user list table, but the user can modify. (see Figure 12 )

Shopping Settlement-- (Third Step) Information Confirmed				
Product Number	Product Name	Product Price	Quantity of Products	Total
101	IBMThinkPadT2021C	16800	1	16800 €
				Sum=16800 €
Recipient Name:	Yeyin Shen			
Address:	Sammonkatu 4C 2			
Zip:	94600	Telephone:	059398860	
Email:	shenyeyin0606@hotmail.com			
Payment Methods:	Mail Remittance			
Order Comments:				
<input type="button" value="Previous"/> <input type="button" value="Submit"/>				

**Fig. 12. List of Shopping Settlement**

## 5.4.2 Administrator Module

### Administrator login

Administrator Login--	
Administrator account:	<input type="text"/>
Administrator password:	<input type="text"/>
<input type="button" value="Submit"/>	

**Fig. 13. Administrator Login**

In figure 13, this is the login field where administrator can type the administrator account and password to login. The address is: [http://127.0.0.1/admin/shop\\_login.htm](http://127.0.0.1/admin/shop_login.htm)

In addition to online shopping system that allows users to browse and shop front to achieve such operations, but also must be able to enable managers to a variety of information on system maintenance, such as commodities to add, delete, modify, members of the review, product updates and so on. The management function is a very important part of the online shopping system function.

Administrators can login the main page of the administrator access into the background as maintenance, click after the first is authentication, it need to enter the correct account number, password. As it relates to transaction, for system security consideration, it should be minimal distribution of the administrator account, password, and we should try complex, password frequently changed.

### **Navigation management**

After entering the main page of system management is the use of a frame structure, the left is a tree menu as hidden. On the right shows the specific information.

The main function of managing updates with product information, commodity transaction, member management and operation management, such as the four blocks, product information management, mainly to add new items, delete and modify products have been added.

<b>Product Information</b>	
Add Categories	
Add Subclass Categories	
Add Product	
Product Check	
<b>Commodity Transaction</b>	
Order processing	
Order Query	
<b>Member Management</b>	
Members	
Scrutiny	
<b>Operation Management</b>	
Add Manager	
Administrator	
Reviewed	
Logout	

**Fig. 14. Navigation Management**

The figure 14 is the management list shown to the administrator from which admin can select, edit and delete them from database.

Add product categories--	
Name of product categories:	<input type="text"/>
<input type="button" value="Confirm"/>	

**Fig. 15. Add Product Categories**

In figure 15, it is the table for admin to add product categories.

The following code shows to insert information by using SQL statement:

```
<%
```



```

set rs=server.createobject("adodb.recordset")
sqltext="select * from Product"
rs.open sqltext,conn,3,3
rs.addnew
rs("Class_2")=request.form("class_2_name")
rs("Class_1")=request.form("class_1_name")
rs("Product_name")=request.form("p_name")
rs("Product_intro")=request.form("p_intro")
rs("Product_show")=request.form("p_show")
rs("P_newprice")=request.form("newprice")
rs("P_oldprice")=request.form("oldprice")
rs("P_pic")=request.form("p_pic")
rs("P_Full_pic")=request.form("p_full_pic")
rs.update
%>

```

Product review							
Number	Name	Categories	Subclass Categories	Member Price	Market Price	Handle	Handle
29	IBMThinkPadT2021C	Computer	Laptop	1680	1780	<a href="#">Edit</a>	<a href="#">Delete</a>
30	NESO LD500	Hardware Peripheral	Monitor	368	398	<a href="#">Edit</a>	<a href="#">Delete</a>
31	AnyGate Router	Network Equipment	Router	568	598	<a href="#">Edit</a>	<a href="#">Delete</a>
33	Sun FireV60X	Computer	Server	19.86	21.98	<a href="#">Edit</a>	<a href="#">Delete</a>
34	athlon xp3200+	Hardware Peripheral	CPU	128	136	<a href="#">Edit</a>	<a href="#">Delete</a>

**Fig. 16. Product Review**

In figure 16, this is the table for admin to check the products and edit or delete the product. After confirm, the system will record information in related database table.

After completing the system update, as managers, should be immediately logout your account, the options is at the bottom of the tree menu, click after the logout, and return to the front page, it to prevent others from malicious modified Web site information, resulting in unnecessary losses.

These two parts user module and administration module are relatively simple implementation of function in a Web shop system.

## 6 CONCLUSION

This thesis was completed under my supervisor Aalto Teppo with the careful guidance; from choosing the topics to project task that he gives me many earnest teachings and meticulous guidance. I got benefit a lot from both of academic standards and academic attainments. This knowledge provided valuable experience for my future study and work. Though this the final project lacks of own learning. Primarily lack of practical ability, but I will study and work hard in future, continue to enrich myself and improve myself.

After several months of design and development, a Web shop system development is completed. The function was to achieve the basic requirements. It is able to complete the management interface and user login process design, information management module, product category management module, order management module and so on.

Through this project, I am deeply to understanding of the ASP, IIS, Microsoft Access. From theory to practice, from perceptual knowledge to rational knowledge, I really have learned to use, combination of the theory in practice, further understand the rules of information systems development.

However, I met a lot of problems during the project, sometimes a small error will make me spend a lot of time and concentrate efforts on finding and fix. I have overcome the problems finally. Since then, I will redouble my efforts to research, acquire more skilled on the basis of new technology to improve my level of development. On the other hand it proved my knowledge and ability, I have been raising awareness of own quality.

## 7 REFERENCES

- /1/ Internet Information Server Overview., [WWW-document],  
<<http://www.iis.net/overview>>. 2010
- /2/ Apache http server About., [WWW-document],  
<[http://httpd.apache.org/ABOUT\\_APACHE.html](http://httpd.apache.org/ABOUT_APACHE.html)>. 2010
- /3/ Hiawatha About., [WWW-document],  
<<http://www.hiawatha-webserver.org/about>>. 2010
- /4/ Baike Baidu., [WWW.document],  
<<http://baike.baidu.com/view/355.htm>>, 2010
- /5/ MySQL Tutorial., [WWW-documen],  
<<http://www.mysql.com/why-mysql/>>. 2010
- /6/ PostgreSQL About., [WWW-document],  
<<http://www.postgresql.org/about/>>. 2010
- /7/ Oracle Database Documentation Library., [WWW-document],  
<[http://download.oracle.com/docs/cd/B19306\\_01/server.102/b14220/intro.htm#i62345](http://download.oracle.com/docs/cd/B19306_01/server.102/b14220/intro.htm#i62345)>. 2010
- /8/ Infoq., [WWW-document],  
<<http://www.infoq.com/news/2009/03/top-scripting-languages-php-ruby>>. 2010
- /9/ PHP Tutorial., [WWW-document],  
<<http://fi.php.net/manual/en/preface.php>>. 2010
- /10/ Ruby Tutorial., [WWW-document],  
<<http://www.ruby-lang.org/en/>>. 2010
- /11/ Python About., [WWW-document],  
<<http://www.python.org/about/>>. 2010
- /12/ Django Tutorial., [WWW-documeny],  
<<http://www.djangoproject.com/>>. 2010
- /13/ Microsoft ASP.net Tutorial., [WWW-document],  
<<http://www.asp.net/mvc/whatisaspmvc>>. 2010

/14/ Ruby on Rails Tutorial., [WWW-document],  
<<http://rubyonrails.org/>>. 2010

/15/ Architecture Resources for enterprise Advantage., [WWW-document],  
<[http://www.bredemeyer.com/pdf\\_files/functreq.pdf](http://www.bredemeyer.com/pdf_files/functreq.pdf)>. 2010

/16/ Leszek A, Maciaszek, 2001, Requirements analysis and System Design, developing information systems with UML, p3

/17/ PCGuide., [WWW-document],  
< <http://www.pcguides.com/ref/hdd/perf/raid/levels/single.htm>>. 2010

/18/ Leszek A, Maciaszek, 2001, Requirements analysis and System Design, developing information systems with UML, p275

/19/ Leszek A, Maciaszek, 2001, Requirements analysis and System Design, developing information systems with UML, p244

/20/ Leszek A, Maciaszek, 2001, Requirements analysis and System Design, developing information systems with UML, p250

/21/ Leszek A, Maciaszek, 2001, Requirements analysis and System Design, developing information systems with UML, p255

/22/ Leszek A, Maciaszek, 2001, Requirements analysis and System Design, developing information systems with UML, p256

/23/ Leszek A, Maciaszek, 2001, Requirements analysis and System Design, developing information systems with UML, p260

## **8 LIST OF APPENDICES**

Appendix A:    Functionality

Appendix B:    Use Case

Appendix C:    Test Case

## Appendix A

- 1) Customer link to the URL and register for a user account.
- 2) The system generates username and password.
- 3) The system authenticates the login by checking the validity of username and password.
- 4) Customer can search products.
- 5) Customer can update their personal information such as, password and address, e-mail.
- 6) Customer can write information or give suggestions in content.
- 7) The administrator should get registered users personal information and restore to database.
- 8) Administrator can edit user information and update it when necessary.
- 9) Administrator should put delivery information to the page for users to check.
- 10) Administrator can edit products information and update it when necessary.

## Appendix B

### Use case of registration

Use Case ID:	UC1		
Use Case Name:	Registration		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Unregistered customer		
Description:	When the unregistered users want to buy products, they must register.		
Trigger:	None		
Preconditions:	Customer use the system of Web shop first time.		
Post conditions:			
Normal Flow:	<p>Type URL: the main page of Web shop pops up, which allows customers to register.</p> <p>Customer clicks the register button/link. A page pops up with requested information entries for users to input.</p> <p>Customers input requested Information: user name, password, email address, and other personal information.</p> <p>Customer clicks the button of submit.</p>		
Alternative Flows:	None		
Exceptions:	<b>1.0.E1 The registration is rejected.</b> Back to step 2.		
Includes:	None		
Priority:	High		
Frequency of Use:	Unknown		
Business Rules:	N/A		
Special Requirements:	Server, Database		
Assumptions:	None		
Notes and Issues:			

### Use case of login

Use Case ID:	UC2		
Use Case Name:	Login		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin

Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Customer and Administrators		
Description:	Customer and administrator want to login to the main page.		
Trigger:	None		
Preconditions:	Customer are registered already.		
Post conditions:			
Normal Flow:	Click the Member Login button, a page pops up asking for username and password. Type username and password. Click on login to submit username and password to the system.		
Alternative Flows:	None		
Exceptions:	<b>2.0.E.1 Enter username or password empty.</b> Shows back button and to step 2. <b>2.0.E.2 Username doesn't match the password.</b> Shows back button and to step 2.		
Includes:	User database in system.		
Priority:	High		
Frequency of Use:	Unknown		
Business Rules:	N/A		
Special Requirements:	Server, Database		
Assumptions:	None		
Notes and Issues:			

### Use case of search

Use Case ID:	UC 3		
Use Case Name:	Search		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Customer		
Description:	When the customer want to search products.		
Trigger:	None		
Preconditions:	Customer were successfully login.		
Post conditions:			
Normal Flow:	Customer are into Web shop system. Customer type keyword and click the button of search. Customer select and check what they need.		



Alternative Flows:	None
Exceptions:	<p><b>3.0.E1 The system has not search the result.</b> Shows the search again back to step 2.</p> <p><b>3.0.E2 Pre-visit time overdue, the system automatically exit.</b> Back to UC2.</p>
Includes:	User database in system.
Priority:	High
Frequency of Use:	Unknown
Business Rules:	N/A
Special Requirements:	Server, Database
Assumptions:	None
Notes and Issues:	

#### Use case of track order

Use Case ID:	UC 4		
Use Case Name:	Track Order		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Customer		
Description:	When the customer want to know products delivery status.		
Trigger:	None		
Preconditions:	Customer were successfully order products and purchase from the market.		
Post conditions:			
Normal Flow:	Customer are into Web shop system. Customer type order number and click the button of inquire.		
Alternative Flows:	None		
Exceptions:	<p><b>4.0.E1 The system has not found the order.</b> Back to step 2.</p> <p><b>4.0.E2 Enter the wrong order number.</b> Shows “is not belongs to your order” and enter “back” button. Back to step 2.</p> <p><b>4.0.E3 Pre-visit time overdue, the system automatically exit.</b> Back to UC2.</p>		
Includes:	User database in system.		
Priority:	High		

Frequency of Use:	Unknown
Business Rules:	N/A
Special Requirements:	Server, Database
Assumptions:	None
Notes and Issues:	

#### Use case of view shopping cart

Use Case ID:	UC 5		
Use Case Name:	View shopping cart		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Customer		
Description:	When the customer want to see products information which they choose.		
Trigger:	None		
Preconditions:	Customer were successfully added products in the shopping cart.		
Post conditions:			
Normal Flow:	Customer click the button of view shopping cart. Customer can confirm edit. Customer can continue shopping Customer can cancel the order Customer can go to checkout.		
Alternative Flows:	None		
Exceptions:	<b>5.0.E1 Pre-visit time overdue, the system automatically exit.</b> Back to UC2.		
Includes:	User database in system.		
Priority:	High		
Frequency of Use:	Unknown		
Business Rules:	N/A		
Special Requirements:	Server, Database		
Assumptions:	None		
Notes and Issues:			

#### Use case of edit products

Use Case ID:	UC 6
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Use Case Name:	Edit Products		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Administrator		
Description:	Administrator wants to handle products.		
Trigger:	None		
Preconditions:	Administrator is registered already.		
Post conditions:			
Normal Flow:	Select category to edit. Insert the information and confirm.		
Alternative Flows:	None		
Exceptions:	<b>6.0.E1 Pre-visit time overdue, the system automatically exit.</b> Back to UC2.		
Includes:	User database in system.		
Priority:	High		
Frequency of Use:	Unknown		
Business Rules:	N/A		
Special Requirements:	Server, Database		
Assumptions:	None		
Notes and Issues:			

#### Use case of edit orders

Use Case ID:	UC 7		
Use Case Name:	Edit Orders		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Administrator		
Description:	Administrator wants to handle orders.		
Trigger:	None		
Preconditions:	Administrator is registered already.		
Post conditions:			
Normal Flow:	Select category to edit. Edit status and confirm.		
Alternative Flows:	None		
Exceptions:	<b>7.0.E1 Pre-visit time overdue, the system automatically</b>		

	<b>exit.</b> Back to UC2.
Includes:	User database in system.
Priority:	High
Frequency of Use:	Unknown
Business Rules:	N/A
Special Requirements:	Server, Database
Assumptions:	None
Notes and Issues:	

#### Use case of edit member

Use Case ID:	UC 8		
Use Case Name:	Edit Member		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Administrator		
Description:	Administrator wants to handle Member.		
Trigger:	None		
Preconditions:	Administrator is registered already.		
Post conditions:			
Normal Flow:	Check the registered member details. Delete the member.		
Alternative Flows:	None		
Exceptions:	<b>8.0.E1 Pre-visit time overdue, the system automatically exit.</b> Back to UC2.		
Includes:	User database in system.		
Priority:	High		
Frequency of Use:	Unknown		
Business Rules:	N/A		
Special Requirements:	Server, Database		
Assumptions:	None		
Notes and Issues:			

#### Use case of edit management

Use Case ID:	UC 9
Use Case Name:	Edit Management

Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Administrator		
Description:	Administrator wants to handle admin information.		
Trigger:	None		
Preconditions:	Administrator is registered already.		
Post conditions:			
Normal Flow:	Administrator adds a new manger in the system. Review the admin information. Change the password or delete account.		
Alternative Flows:	None		
Exceptions:	<b>9.0.E1 Pre-visit time overdue, the system automatically exit.</b> Back to UC2.		
Includes:	User database in system.		
Priority:	High		
Frequency of Use:	Unknown		
Business Rules:	N/A		
Special Requirements:	Server, Database		
Assumptions:	None		
Notes and Issues:			

### Use case of logout

Use Case ID:	UC 10		
Use Case Name:	Logout		
Created By:	Shen Yeyin	Last Updated By:	Shen Yeyin
Date Created:	01-09-2010	Date Last Updated:	05-09-2010
Actors:	Customer and Administrator		
Description:	Customer and administrator want to logout the system.		
Trigger:	None		
Preconditions:	Customer and administrator are all login.		
Post conditions:			
Normal Flow:	Click on button "Logout".		
Alternative Flows:	None		
Exceptions:			
Includes:	User database in system.		

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Priority:	High
Frequency of Use:	Unknown
Business Rules:	N/A
Special Requirements:	Server, Database
Assumptions:	None
Notes and Issues:	

## Appendix C

### Test case of registration

Test case ID:	TC 1
Test case name:	Registration
Purpose:	Customer to register their own username and password.
Prereq:	This function is just for new customer.
Test data:	User account, Name, Gender, Password, Password confirm, Password question, Password answer, Email, Telephone, Address, Zip
Steps:	<p>Steps to carry out the test. See step formatting rules below.</p> <p>Click on registration link.</p> <p>Type User account, Name, Gender, Password, Password confirm, Password question, Password answer, Email, Telephone, Address, Zip.</p> <p>Click "Confirm" button.</p> <p>See the registration information form.</p> <p>Click "Go to shopping" button.</p> <p>Go back to the homepage.</p>
Expected results:	Registering customer's account successful. (Error message if username and password wrong).
Test results: (date/result/tester)	<p>10-09-2010</p> <p>Show customer register successful.</p> <p>Show customer register unsuccessful.</p> <p>Shen Yeyin</p>

### Test case of login

Test case ID:	TC 2
Test case name:	Login
Purpose:	Customer log into the system with existing login information.
Prereq:	This function is for Customer and Administrator.
Test data:	<p>Member Name={ Valid Member Name, invalid Member name, empty }</p> <p>Password = { Valid password, invalid password, empty }</p>
Steps:	<p>Steps to carry out the test. See step formatting rules below.</p> <p>Enter Member Name.</p> <p>Enter Password.</p> <p>Click "Login" button.</p>
Expected results:	Customer login is successful.

	(Error message if username or password doesn't match).
Test results: (date/result/tester)	10-09-2010 Verify that welcome message is correct member name. Shows wrong username or password. Shen Yeyin

### Test case of search

Test case ID:	TC 3
Test case name:	Search
Purpose:	Customer can search product which they want.
Prereq:	The function is for customer.
Test data:	Product Name={ Valid Product Name, invalid Product name, empty} Category={ Computer, Hardware, Network Equipment, Mobile Digital, Software }
Steps:	Steps to carry out the test. See step formatting rules below. Enter the product name. Choose the category. Click the "Inquire" button.
Expected results:	Items are displayed successfully.
Test results: (date/result/tester)	10-09-2010 The system display searching result. (Error message shows have not found result). Shen Yeyin

### Test case of track order

Test case ID:	TC 4
Test case name:	Track Order
Purpose:	Customer can see the product status.
Prereq:	The function is for customer.
Test data:	Order Number={ Valid order number, invalid order number, empty }
Steps:	Steps to carry out the test. See step formatting rules below. Enter the order number. Click "Inquire" button.
Expected results:	Product status is displayed successfully. (Error message shows wrong order number).
Test results: (date/result/tester)	10-09-2010 It will show the products status.



	It will show the message: the item is not belongs to you. Shen Yeyin
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#### **Test case of view shopping cart**

Test case ID:	TC 5
Test case name:	View shopping cart
Purpose:	Customer wants to see products information which they choose.
Prereq:	The function is for customer.
Test data:	
Steps:	Steps to carry out the test. See step formatting rules below. Click the "View shopping cart" link.
Expected results:	The items which choose are displayed successfully.
Test results: (date/result/tester)	10-09-2010 It will displays the list of items you choose form. Shen Yeyin

#### **Test case of edit products**

Test case ID:	TC 6
Test case name:	Edit Products
Purpose:	Administrator wants to handle products information.
Prereq:	The function is just for administrator.
Test data:	
Steps:	Steps to carry out the test. See step formatting rules below. Choose one category to edit.
Expected results:	Edit shows successfully. (Error message if filed nothing).
Test results: (date/result/tester)	10-09-2010 The page will show the navigation management page. Shows handle success. Show the wrong page. Shen Yeyin

#### **Test case of edit orders**

Test case ID:	TC 7
Test case name:	Edit Orders
Purpose:	Administrator wants to handle order information.
Prereq:	The function is just for administrator.

Test data:	
Steps:	Steps to carry out the test. See step formatting rules below. Choose one category to edit.
Expected results:	Edit shows successfully. (Error message if filed nothing).
Test results: (date/result/tester)	10-09-2010 The page will show the navigation management page. Shows handle success. Show the wrong page. Shen Yeyin

#### Test case of edit member

Test case ID:	TC 8
Test case name:	Edit Member
Purpose:	Administrator wants to handle member information.
Prereq:	The function is just for administrator.
Test data:	
Steps:	Steps to carry out the test. See step formatting rules below. Check member details and to edit.
Expected results:	Edit shows successfully. (Error message if filed nothing).
Test results: (date/result/tester)	10-09-2010 The page will show the navigation management page. Shows handle success. Show the wrong page. Shen Yeyin

#### Test case of edit management

Test case ID:	TC 9
Test case name:	Edit Management
Purpose:	Administrator wants to management information.
Prereq:	The function is just for administrator
Test data:	
Steps:	Steps to carry out the test. See step formatting rules below. Add manager. Change admin password or delete.
Expected results:	Manage shows successfully. (Error message if account name or password wrong).
Test results:	10-09-2010

(date/result/tester)	The page will show the navigation management page. Shows handle success. Show the wrong page. Shen Yeyin
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**Test case of logout**

Test case ID:	TC 10
Test case name:	Logout
Purpose:	User logs out of the system.
Prereq:	This function is for Customer and Administrator.
Test data:	
Steps:	Steps to carry out the test. See step formatting rules below. Click "Logout button" Go back to the homepage.
Expected results:	User logout is successful.
Test results: (date/result/tester)	10-09-2010 Show the main page. Shen Yeyin