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DYNAMIC WEB REPORTS
(DYNA REPORT)

By

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Of

KUMARAGURU COLLEGE OF TECHNOLOGY

COIMBATORE

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BONAFIDE CERTIFICATE

Certified that this project report titled **"DYNAMIC WEB REPORTS (DYNA REPORT)"** is the bonafide work of **"Mr.P.GUNASEKARAN"** (Registration Number: **71206621018**) who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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Submitted to Project and Viva Examination held on 06/07/2009

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To whomsoever it may Concern

This is to certify that **Mr. Gunasekaran P** a student of **Kumaraguru College of Technology**, had undergone a project titled **Dynamic Web Reports (Dyna Report)** at **Cognizant Technology Solutions India Pvt.Ltd** under the guidance of **Mr. Pradeep Natarajan** (Assistant Manager Projects).

The duration of the project was from 01/11/08 and 01/05/09.

We wish him all the success for his future endeavors

For Cognizant Technology Solutions India Pvt. Ltd.

Prabhu Chari
Asst. Manager - Human Resources

May 10, 2009

ABSTRACT

Dynamic Web Reports is a pure web based reporting tool, it allows users to easily develop and deploy sophisticated reports across any platform. It includes a visual design environment making it easy to incorporate reporting functionality. The advanced features allow users to easily create powerful data presentations, and deliver them in a variety of formats.

Dynamic web Report allows users to build reports from any JDBC data source. For users with limited database knowledge, it provides the Data View Interface and it insulates users from database complexity, by allowing users to pre-view tables from which end-users can then select fields, and performs reporting without any knowledge of the underlying database structures. User can store a set of reports as their favorite reports.

Using dynamic web reports user can generate reports in a number of different formats including

- Tabular HTML
    i. Interactive sorting
    ii. Drag and Move Columns
- Bar Charts ,
- Pie Charts ,
- Line Graphs.

Report data can be exported to

- Microsoft Excel,
- CSV (comma separated values).

The system is designed and developed using J2EE technology. JSP for design the user interface, Servlets to control the actions, core Java for the Business logic and JDBC connection.

ACKNOWLEDGEMENT

I extend my heartfelt gratitude to "The Almighty" for blessing this work in my hands. I am very grateful to my parents for the encouragement and support they have given.

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LIST OF ABBREVIATIONS

JDBC	JAVA DATABASE CONNECTIVITY
DWR	DYNAMIC WEB REPORTS
XML	EXTENSIBLE MARKUP LANGUAGE
HTML	HYPERTEXT MARKUP LANGUAGE
JSP	JAVA SERVER PAGES
CSV	COMMA SEPERATED VALUES
MVC	MODEL VIEW CONTROLLER
J2EE	JAVA PLATFORM ENTERPRISE EDITION
JVM	JAVA VIRTUAL MACHINE
URL	UNIFORM RESOURCE LOCATOR
UI	USER INTERFACE

1 INTRODUCTION

1.1 PROBLEM DEFINITION

1.1.1 Scope

The scope of Dynamic Web Report is to develop web based platform independent reporting tools that help end users to create, view, export, set favorite and maintaining various reports.

1.1.2 Goal

1. User should be able to create reports, run reports on demand, set favorite reports and view and export the report.
2. To generate report user can choose the data to be displayed, by design the format for report or use the existing report template.
3. To run reports on demand, let's give user a favorite list so they can have a quick access to the report they care about.
4. Security mechanism is used to create and delete users as well as user groups and assign rights to the user group. So the reports will be viewed by the users based upon the rights given to them.

1.1.3 Objective

Dynamic web reports address a wide range of reporting needs with a typical web application, which provides a rich set of viewing capabilities for printing a document, view documents online and for generating alternative document.

Objective of Dynamic web reports is first to design a report and then to view the report in the required format.

1.2 ORGANISATION PROFILE

Cognizant Technology Solutions is an information technology services and consulting company with headquarters in Teaneck, New Jersey, United States and with significant operations in Chennai, India. Cognizant has been named to the 2007 Fortune Hundred 100 Fastest-Growing Companies List for the fifth consecutive year, making it the only company receiving the "Five-year all-stars" distinction in 2007's list. Cognizant has also been named in the top 10 of Business Week's Hot Growth Technology Companies. Cognizant was ranked 6th overall. It was the Number 1 ranked IT services Company in the list. Cognizant has been ranked 7th on "Forbes List of 50 Fastest Growing Tech Companies" for the year 2008.

With the turn of the new millennium, Cognizant successfully expanded it's client base to Fortune 500 customers in Financial Services, Healthcare, Information, Media and Entertainment, Retail and Manufacturing and diversified it's services to new technologies and internet based applications. The company currently serves over 500 customers across 9 industry verticals.

Cognizant has been named to the 2007 Fortune Hundred 100 Fastest-Growing Companies List for the fifth consecutive year, making it the only company receiving the "Five-year all-stars" distinction in 2007's list. Cognizant has also been named in the top 10 of Business Week's Hot Growth Technology Companies. Cognizant was ranked 6th overall. It was the Number 1 ranked IT services Company in the list. Cognizant has been ranked 7th on "Forbes List of 50 Fastest Growing Tech Companies" for the year 2008.

2 SYSTEM ANALYSIS

2.1 EXISTING SYSTEM

The Existing Report generating system was predefined reports, generated by passing SQL commands to the database and they are stored in the Report Module of the project. Programmers can control the size of the report results by limiting the number of data while coding. The user can only view the report, they had no features to design or modify the format of the report. But the solution was not dynamic enough since users kept requesting more new reports. The programmatic change was required whenever a need for new report or query and that change can introduce bugs and they are time consuming since developer must meet the user to understand the request.

2.1.1 Drawbacks of Existing System

1. User cannot design the report.
2. Reports cannot export to other format.
3. Report was totally depending on predefined query.
4. User had no option to choose data field for final report.

2.2 PROPOSED SYSTEM

Dynamic Web Report has been proposed to aim at making a flexible and user-configurable system that every thing is created at runtime. Each time a dynamic report is run, it gathers the most recent data in the Database. Only the report definition, which remains the same over time, is stored. Dynamic report gives user the full control of report design of report from the file system. User can export the report into CSV, Excel formats etc., and set their favorite reports for quick accessibility.

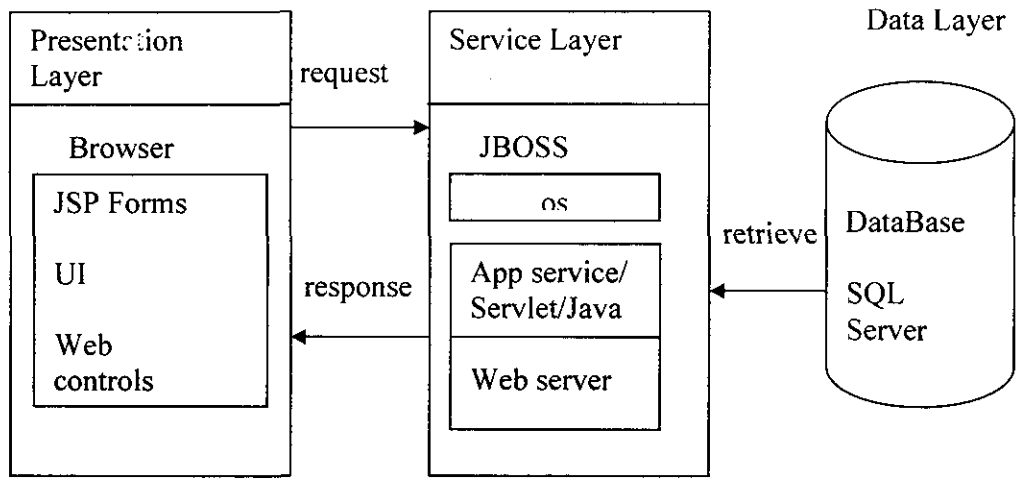


Figure 2.2.1 Proposed system

2. 2.2 Advantage of Proposed System

1. User will design his own report.
2. User will choose what data field to be displayed on report.
3. In HTML table view, data can be sorted in front end and interchange columns.
4. User can view data in Graph, Chart and export report to Excel, CSV format.

2.3 FEASIBILITY ANALYSIS

Feasibility analysis is the measure of how beneficial or practical the development of an information system will be to organization. Once the problem is explained, information is gathered about the system to test whether the system is viable Technically, Financially and Operationally.

2.3.1 Feasibility Considerations

The key considerations involved in the feasibility analysis are

- Economic
- Technical
- Operational

2.3.1.1 Economic Feasibility

Economic feasibility is the measure of the cost-effectiveness of the proposed system. The investment to be made in the proposed system must prove a good investment to the organization by returning benefits equal to or exceeding the cost incurred in developing the system.

The proposed benefit of the system outweighs the costs to be incurred during system development. Since, the system does not require procurement of additional hardware facilities, it is economically feasible. In addition, capability of the system to incorporate future need of the user and the fact that a single system can be used for a standalone organization as well as a corporate, improves its marketing prospect.

2.3.1.2 Technical Feasibility

Technical feasibility takes care of the technical issues that are to be tested to see whether the system is feasible. Technical feasibility analysis makes a comparison between the level of technology available and the technology that is needed for the project. The level of technology is determined by factors such as the software tools available, the machine environment, platform etc. Since, resources required for the development of the project are already available in the organization, the project is technically feasible.

2.3.1.3 Operational Feasibility

The resources that are required for implementation are already with the organization. The personnel of the organization already have enough exposure to computers. So the project is feasible.

3 DEVELOPMENT ENVIRONMENT

The goal of software requirements definition is to completely specify the technical requirements for the software products in a concise and unambiguous manner. The Software Requirements Specification is based on the system definition. High-level requirements specified during initial planning, are elaborated and/or more specific in order to characterize the features that the software product will incorporate.

3.1 HARDWARE REQUIREMENTS

This section describes the hardware components with which the application was developed.

PROCESSOR	:	Pentium Dual-Core
PROCESSOR SPEED	:	2.6 GHz
RAM	:	2 GB
HARD DISK SIZE	:	160 GB

3.2 SOFTWARE REQUIREMENTS

This section describes the software in which the application was developed and using the same software would make it more compatible

OPERATING SYSTEM	:	Windows XP
J2EE FRAMEWORK	:	JSP, Servlet, JDBC
SCRIPTING LANGUAGE	:	JavaScript
BACK END	:	SQL Server 2000
APPLICATION SERVER	:	JBOSS
BROWSER	:	FIREFOX OR IE6+

TOOLS USED

IDE	:	MYECLIPSE

3.3 SOFTWARE DESCRIPTION

3.3.1 J2EE

Java Platform, Enterprise Edition or Java EE is a widely used platform for server programming in the Java programming language. Java EE includes several API specifications, such as JDBC, RMI, e-mail, JMS, web services, XML, etc, and defines how to coordinate them. Java EE also features some specifications unique to Java EE for components. These include Enterprise JavaBeans, servlets, JSP and several web service technologies. This allows developers to create enterprise applications that are portable and scalable, and that integrate with legacy technologies.

A Java EE application server can handle transactions, security, scalability, concurrency and management of the components that are deployed to it, in order to enable developers to concentrate more on the business logic of the components rather than on infrastructure and integration tasks.

3.3.2 MVC in J2EE

Simple Version using only Java Servlets and Java Server Pages from Java EE:

3.3.2.1 Model

The model is a collection of Java classes that forms a software application intended to store and optionally move data. There is a single front end class that can communicate with any user interface (for example: a console, a graphical user interface, or a web application).

3.3.2.2. View

The view is represented by JavaServer Page, with data being transported to the page in the HttpServletRequest or HttpSession.

3.3.2.3 Controller

The controller servlet communicates with the front end of the model and loads the HttpServletRequest or HttpSession with appropriate data, before forwarding the HttpServletRequest and Response to the JSP using a RequestDispatcher.

3.3.3. MYECLIPSE

MyEclipse is a commercially available Java EE created and maintained by the company Genuitec, a founding member of the Eclipse Foundation. MyEclipse is built upon the Eclipse platform, and integrates both proprietary and open source solutions into the development environment.

MyEclipse is used as a web development tool required for designing and coding the project. It contains many perspectives and this project is developed in java perspective. Jar files and server are added and run using MyEclipse interface.

3.3.4 JBOSS

JBoss Application Server (or JBoss AS) is a free software / open source Java EE-based application server. Because it is Java-based, the JBoss application server is cross-platform, usable on any operating system that Java supports.

JBoss-4.2.2.GA is used as deployment server. Before deploying the project the server should be configured and necessary jars should be added. After deploying, the project can be run using any web browser.

3.3.5 SQL SERVER 2000

Microsoft SQL Server 2000 is a full-featured relational database management system that offers a variety of administrative tools to ease the burdens of database development, maintenance and administration.

Enterprise Manager is the main administrative console for SQL Server installations. Enterprise Manager provides you with a graphical "birds-eye" view of all of the SQL Server installations on our network. We can perform high-level administrative functions that affect one or more servers, schedule common maintenance tasks or create and modify the structure of individual databases using Enterprise Manager.

Query Analyzer offers a quick and dirty method for performing queries against any of your SQL Server databases. It's a great way to quickly pull information out of a database in response to a user request, test queries before implementing them in other applications, create/modify stored procedures and execute administrative tasks.

4 SYSTEM DESIGN

System design refers to an abstract representation of the system ant it presents the design for the implementation of Dynamic Web Report. It concerned with making sure the system will meet the requirement of the product, as well as ensuring the future requirements can be addressed. It also addresses interface between the system and other products. Major step in system design is the preparation of the input forms and the output reports in a form applicable to the user.

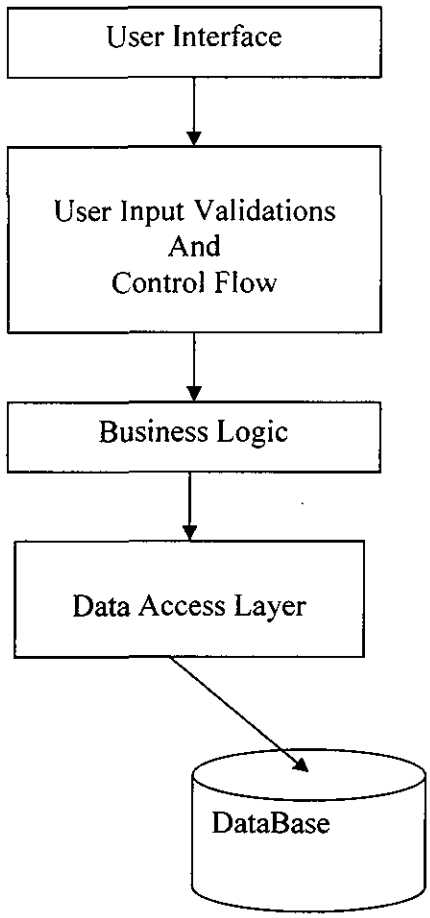
4.1 ARCHITECTURE DESIGN

The architectural design is the design of the entire software system; it gives a high-level overview of the software system, such that the reader can more easily follow the more detailed descriptions in the later sections.

Layering Architecture

The system consists of four layers, namely

- Client
- Listeners, Application Controllers and Business Event Translators
- Business Layer, Data Access Layer and Adaptors
- Enterprise Data Layer



4.1.1. Architecture Layer

The user interface will consist of a web interface that will display to the user the necessary details and also allow user to add details. The details that user enter will go through validation before being presented to the business logic layer. The business logic layer takes care of functionalities required for the system. Data Access Layer involves connecting to the database and retrieving and updating to the database.

4.2 SYSTEM FLOW DIAGRAM

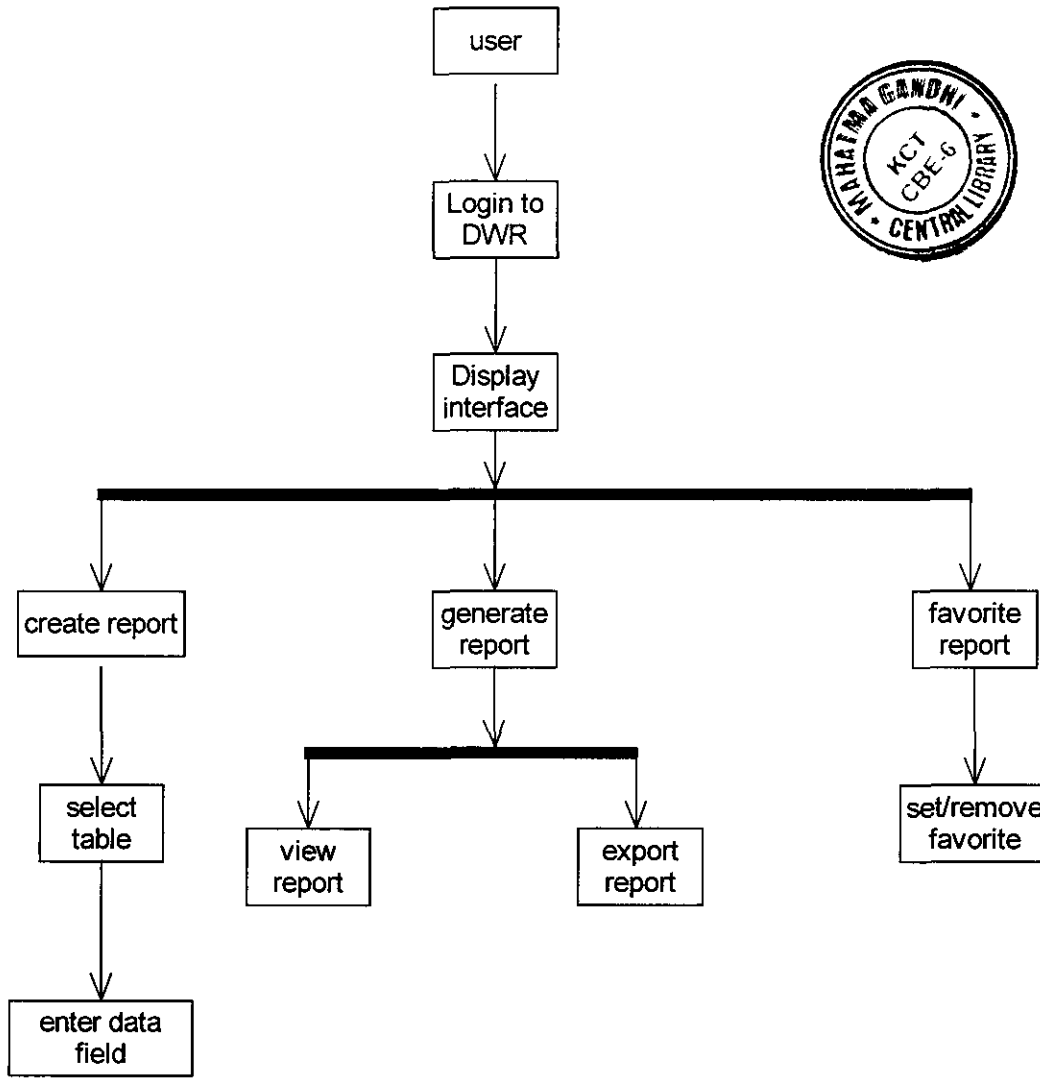
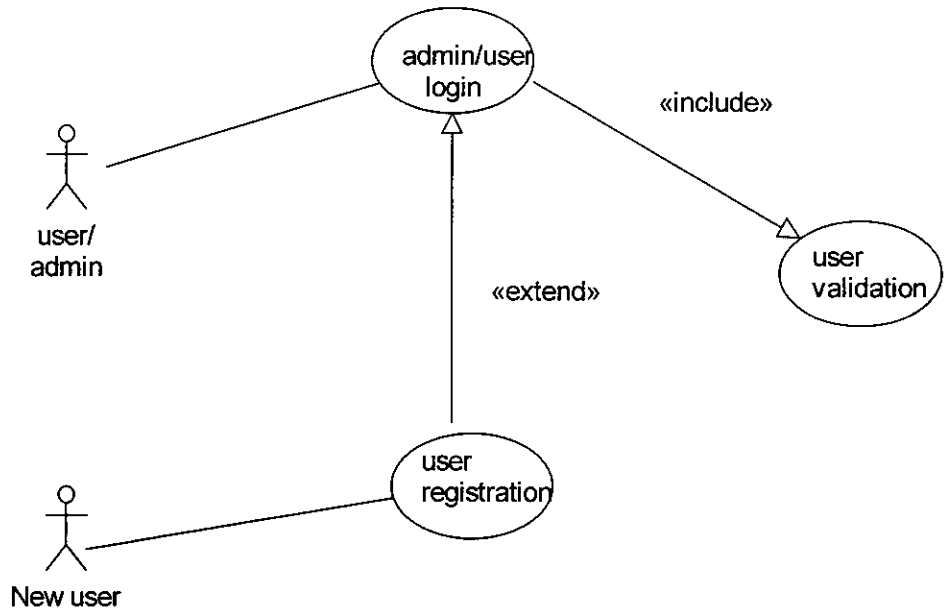


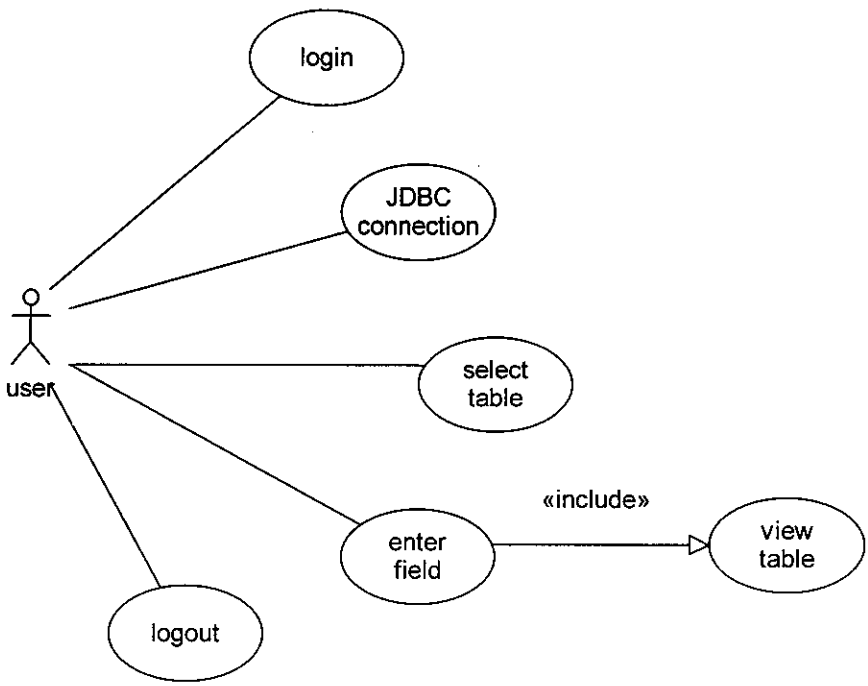
Figure 4.2.1 System Flow Diagram

4.3 USE CASE DIAGRAM

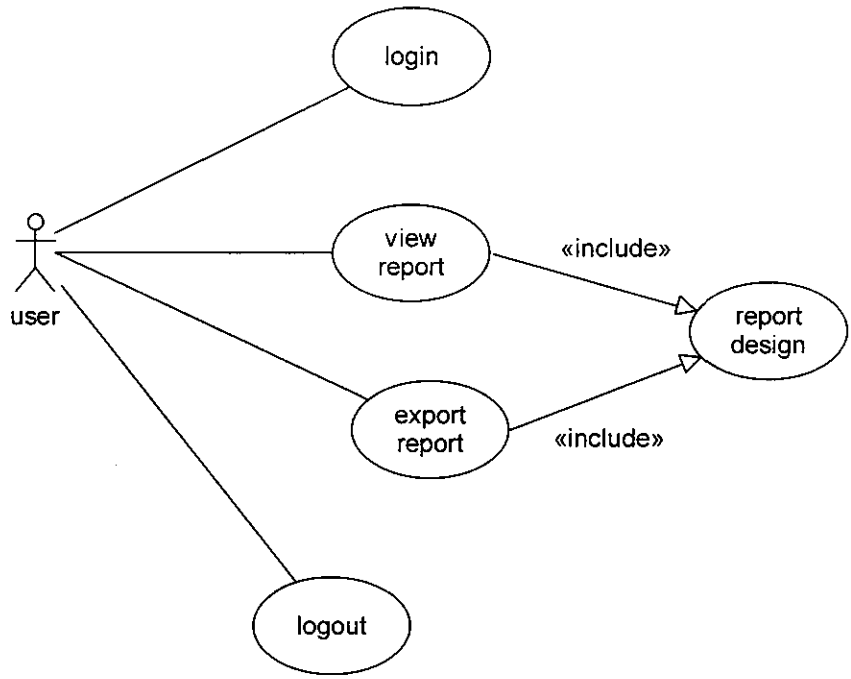
4.3.1 Use Case Diagram for User Login and Registration



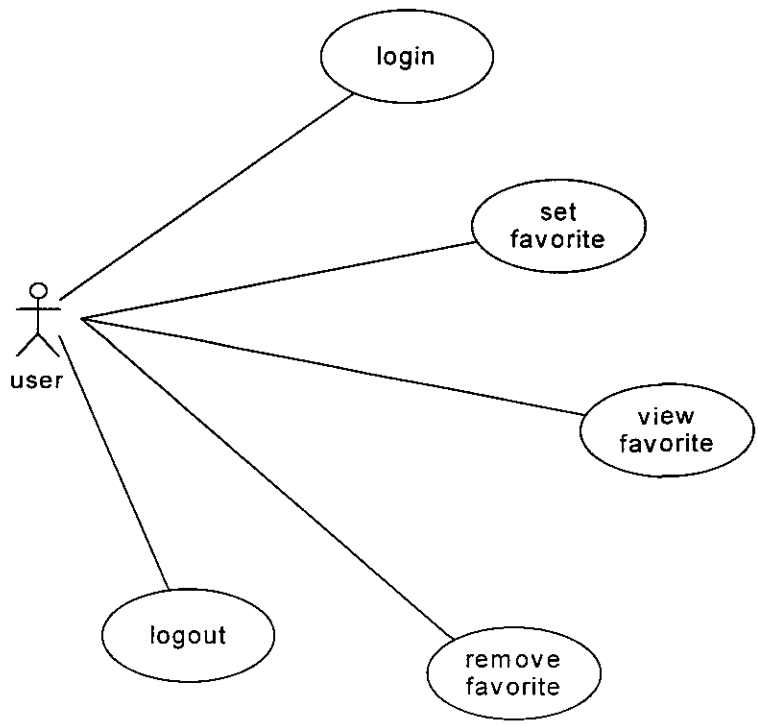
4.3.2 Use Case Diagram for Report Design



4.3.3 Use Case diagram for Generate Report



4.3.4 Use Case diagram for favorite report



4.3.1 Use Case Description

Use case Name	**Login**
Primary Actor	User
Pre-Condition	User knows how to get to the website.
Success End Condition	Successful Login
Failed End Condition	Login fails
DESCRIPTION	
User	**system**
User keys in username and password.	System validates username and password from the database. System displays welcome and options.
Alternate Scenario	
User keys in username and password.	System displays error message and again asks for username and password.

Table 4.3.1 Use Case Login Description

Use case Name	**Report Design**
Primary Actor	User
Pre-Condition	User is already logged in.
Success End Condition	Successful report definition.
Failed End Condition	Report Design may fail due to one of many reasons.
DESCRIPTION	
User	**System**
User chooses the design report from the website.	System displays database connection page that allows user to enter JDBC connection.
User enters the JDBC connection.	System displays list of tables in the database.
User selects the Table.	Data view of the Table is displayed and allow user to enter the Final field for report.
User enters the data field.	Final Data for the report is displayed to the user.
Alternate Scenario	
User chooses the design report from the website.	System displays database connection page that allows user to enter JDBC connection.
User enters the JDBC connection.	System displays an error message due to some connection or database problem.

Table 4.3.2 Use Case Report Design Description

Use case Name	**Generate Report**
Primary Actor	User
Pre-Condition	User is already logged in.
Success End Condition	Successful report definition.
Failed End Condition	Report generation may fail due to one of many reasons.
DESCRIPTION	
User	**System**
User chooses the design report from the website. User chooses the format of report.	System displays information page that allows user to choose view report or export report. System displays the report in input format.
Alternate Scenario	
User chooses the view report from the website. User chooses the format of report.	System displays information page that allows user to choose view report or export report. System displays an error message due to some connection or database problem.

Table 4.3.3 Use Case Generate Report Description

Use case Name	**Favorite Report**
Primary Actor	User
Pre-Condition	User is already logged in.
Success End Condition	Successfully set favorite report.
Failed End Condition	Favorite Report may fail due to one of many reasons.
DESCRIPTION	
User	**System**
User chooses the favorite report from the website. User enters favorite report.	System displays favorite report page that allows user to enter the reportname, username and link System checks the details in database and it insert the report in database with a success message.
Alternate Scenario	
User chooses the design report from the website. User enters favorite report.	System displays database connection page that allows user to choose view report or export report. System displays an error message due to non availability of details.

Table 4.3.4 Use Case Favorite Report Description

4.4 DATABASE DESIGN

A database is a collection of interrelated date stored with minimum redundancy to serve many users quickly and efficiently. The general objective of the database design is to make the data access easy, inexpensive and flexible to the user. Database is one of the most critical parts of design phase. An elegant database can play a strong foundation for the whole system. The details about the data relevant for the system are identified first.

According to their relationships, tables are designed by following standard database design methods. The data types for each data item in tables are decided. For optimum design of the database, for having data integrity, for avoiding redundancy and for securing the database, all the tables created are normalized. A database design transforms the information domain model created during the analysis into the data structure that will be required to implement the system software.

4.5 TABLE DESIGN

Table Name: GroupDetail
Description: Group Detail table is used to store the details about the group and to give rights to the user based on this group name.

FieldName	Data Type	Width	Key	Description
Groupname	Varchar	20	primarykey	Name of the Group
Note	Varchar	100		Description about group

Table 4.5.1 Group Detail

Table Name: UserDetail
Description: User Detail table is used to store the details about the user for user login and new user registration.

FieldName	Data Type	Width	key	Description
Username	Varchar	20	Primarykey	Name of the user
Password	Varchar	15		Password for user
Firstname	Varchar	20		Firstname of user
Lastname	Varchar	20		Lastname of user
Email	Varchar	25		User's Email
Groupname	Varchar	20	Foreignkey	Name of the Group
Note	Varchar	100		Description about user

Table 4.5.2 User Detail

Table Name: Favorite Report
Description: Favorite Report table used to store the list report favorite to the user.

FieldName	Data Type	Width	Key	Description
Reportid	Varchar	20	primarykey	ID of the report
Username	Varchar	20	Foreignkey	Name of the user
FavoriteReport	Varchar	20		FavoriteReport
Link	Varchar	100		URL of the report

Table 4.5.3 Favorite Report

Table Name: ReportDetail
Description: Report Detail is used to store the details of report accessed by the user.

FieldName	Data Type	Width	Key	Description
Reportno	Varchar	50	Primarykey	Number for the report
Username	Varchar	20	Foreignkey	Name of the user
Tablename	Varchar	20		Database Table name
Reportname	Varchar	20		Name for the report

Table 4.5.4 Report Detail

5 SYSTEM DEVELOPMENT

The development phase for the project was created from the specifications created during the design phase. A principal activity of the development phase is coding and testing the computer program that make up the computer program component of the overall system. Other important activities in the development include implementation, planning, equipment acquisition and system testing. The development phase concludes with the report and review.

5.1 PROJECT DESCRIPTION

Dynamic Web Reports is a web based reporting tool where user can design a new report, generate report in a variety of formats and can store a list of reports as their favorite reports. The input data is taken from any JDBC data source or from XML. And user can connect to databases like MS Access, MS SQL Server, MY SQL, Oracle and many more.

User can open the web page using the URL http://localhost:8080/dwr/login.jsp. New user can enter into the system by giving their details such as username, password, email, groupname etc., Administrator will approve the new users. Once the application is open, it displays menu consists of Report design, Generate Report and Favorite report.

For Report Design, users have to give the JDBC connection details. For example, report to be taken from MS Access Database with the Data Source name as dwr, then user should give DriverName as "sun.jdbc.odbc.JdbcOdbcDriver", URL name as "jdbc:odbc:dwr" , userID as " " and pwd as " ". The application will connect to the MS Access database and retrieve the entire Tables from the database. Users have to select the particular Table for Report from the selection list. For example user can select the "Sales Table" from MS Access database, the Data View of the Sales Table is displays to the user. Then user will type the necessary data field for report by giving Column Name separated by commas in the Sales Table or '*' for whole table. The final data for Report is preview by the user.

For Generating Report, Users can have the list of options to view or export the report. Users can view the report in HTML Table form, where sorting can be done in the Front end using Bubble sort Algorithm, with regardless of any datatype or number of columns used in the table . Users can drag and move the columns anywhere in the table. The same data can be export in MS Excel and CSV format. CSV format will also open in MS Excel format. To generate Line Graph, Bar Chart and Pie Chart, user can generate report for Month and Sales for the respective Month.

Reports that are viewed frequently can be set as favorite report. For favorite report, user can store the Link for the particular report. Users instead of design the report and generate the report, run the favorite report. User can also view their favorite report and can remove their favorite report. Every time favorite report is run, the report will gather the latest information from the database.

5.2 MODULE DESCRIPTION

It is always difficult for any System Development team to grasp a system without breaking it into several smaller systems, These smaller systems will be a part of the original system yet they will be independent in the sense that they will incorporate within them the major functionalities of the proposed system. A software system is always divided into several subsystems which make it easier to develop and perform tests on the whole system. The subsystems are known as the modules and the process of dividing an entire system into subsystems is known as decomposition.

Dynamic Web Reports has the following modules

- Report Design
- Generate Report
- Favorite Report
- User Registration and Login

5.2.1 Report Design

Report Design is a graphical interface for creating report where user can select the data field needs for the report. User can connected to the JDBC data source by entering the connection string. When database is connected, list of tables is displayed and user can select the particular table. Data View Interface of the table is displayed to the user and the user can type the required field from that table for the final report.

5.2.2 Generate Report

5.2.2.1 View Report

User can view report in HTML table, Pie chart, Bar chart and Line graph.

- **HTML Table**

  In HTML table view, reports can be sorted both in ascending and descending order in front end. User can also click and drop the columns anywhere in the table.

- **Pie chart**

  A pie chart or a circle graph is a circular chart divided into sectors, illustrating relative magnitudes in a 2 Dimension format. In a pie chart, the arc length of each sector is proportional to the quantity it represents.

- **Bar chart**

  A bar chart or bar graph is a chart with rectangular bars with lengths proportional to the values that they represent. Bar charts are used for comparing two or more values that were taken over time or on different conditions, usually on small data sets. The bars can be horizontally oriented.

- **Line graph**

  Line graph is an extension of a scatter graph, and is created by connecting a series of points that represent individual measurements with line segments. A line chart is often used to visualize a trend in data over intervals of time, thus the line is often drawn chronologically.

5.2.2.2 Export Report

To export a report, users are prompted to choose an export format like Excel, CSV (comma separated values).

- **Microsoft Excel**

  Microsoft Excel is a spreadsheet-application written and distributed by Microsoft. It features calculation, graphing tools, pivot tables and a macro programming language called VBA (Visual Basic for Applications). It has been the most widely used spreadsheet application available in the market.

- **CSV (comma separated values)**

  A **Comma separated values (CSV)** file is used for the digital storage of data structured in a table of lists form, where each associated item (member) in a group is in association with others also separated by the commas of its set. Each line in the CSV file corresponds to a row in the table. Within a line, fields are separated by commas, each field belonging to one table column.

5.2.3 Favorite Report

In Favorite Report, users can store a list of reports as their favorite and view or remove their favorite report. It stores information such as username, reportname and their favorite report link. Instead of storing the entire report, link for the favorite report is stored.

5.2.4 User Registration and Login

This module allows any user to register into the web site by filling in various details like name, login name, password, email etc. Every user registering is belonged to various groups. The administrator can create a group and users can register in the new group. All users should belong to any of the group.

5.3 MODULE EXECUTION

All the components were successfully integrated and executed in browsers like Firefox, IE7. Dynamic web reports can be used for any application. However, the project needs a database to report, so Sales and Purchase Table is used for reporting.

6 TESTING

Testing is a critical element of software quality and assurance and represents the ultimate review of specification design and coding. It is a vital activity that has to be enforced in the development of any system. This could be done in parallel during all phases of the system development. The feedback received from these testes can be used for further enhancement of the system under consideration. The testing phase conducts test using the Software Requirement Specification as a reference and with the goal to see whether the system satisfies the specified requirements.

Testing objectives are,

- Testing is a process of executing a program with the intent of finding an error.
- A successful test is one that uncovers an as yet undiscovered error.
- A good test case is one that has a high probability of finding an as yet undiscovered error.

The main types of testing carried out on the project are:

6.1 UNIT TESTING

Module or Unit Testing is the process of testing all the program units that make up a system. Unit testing focuses on an individual module thus allowing one to uncover all the errors made logically and while coding in the module. In the project each page is tested separately as a unit. Initially the flow of data through the page is checked. When considering a module as unit, the flow of control through the whole module is tested. In a page, each control is further tested using unit testing. The process is done in all the pages of the system.

Test Case Reports : FavoriteReport Module

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass /Fail
1	setfavorite	Username, reportname, Linkfor report	Favorite report successfully inserted.	Add to favorite successfully.	Pass
2	View favorite report	Click on favorite report	Display all favorite report set by user.	Display all favorite report set by user.	Pass
3	Run favorite report	Click on favorite report	Favorite report run in same page.	Favorite report run in same page.	Pass
4	Remove favorite report	Click on remove favorite	Delete the favorite report.	Delete the favorite report.	Pass

Test case Report: CreateReport Module

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass /Fail
1	JDBC connection	Drivername, URL , Username, password	Database is connected and Tables are displayed.	Database is connected and Tables are displayed.	Pass
2	Select Table	Select a table from the list of option	Data view of table is displayed	Data view of table is displayed	Pass
3	Choose field	Enter data field	Table with entered field are displayed.	Table with entered field are displayed.	Pass

6.2 INTEGRATION TESTING

Integration testing is a logical extension of unit testing. In its simplest form, two units that have already been tested are combined into a component and the interface between them is tested. A component, in this sense, refers to an integrated aggregate of more than one unit. The purpose of Integration testing is to verify functional, performance and reliability requirements placed on major design items.

Test case: Integration testing

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass /Fail
1	Generate report in Table format.	Final data field select from report design.	Result display in HTML Table format.	Result display in HTML Table format.	**Pass**
2	View favorite report	Click on Table report in view favorite report	Display corresponding HTML Table report	Display corresponding HTML Table report	**Pass**

6.3 SYSTEM TESTING

The System testing is the stage of implementation, which is aimed at ensuring that system works accurately before live operations commences. System testing tests that the system meets it requirements, both functional and non-functional requirements.

The main functionalities which we check in this testing are:

- Whether proper connection is established with the domain server or not.
- Whether the user is allowed to traverse the web page or not by checking whether the user gets the information which is in need when a selection is made.

6.4 VALIDATION TESTING

Software Validation is achieved through a series of black-box tests that demonstrate conformity with requirements. Validation succeeds when software functions in a manner that can be reasonably expected by the customer. In this testing, the user validates by providing set of inputs and observing it.

Test case: Validation testing

S. No	Test Case	Input Data	Expected Result	Actual Result	Pass /Fail
1	To check the empty username field	Empty Textbox for username	Username should not be empty.	Username should not be empty.	**Pass**
2	Login	Correct Username and password	Welcome Username in home page.	Welcome Username in home page.	**Pass**
3	Password	Password :12345 Conform Password:1234	Error message displaying password and conform password must be same.	Error message displaying password and conform password must be same.	**Pass**

6.5 SECURITY TESTING

The system in no way shall be accessible to unauthorized users. Testing is done to ensure that a user with respective permission can only view the various forms and reports presented by the project.

Test case: Security testing

S. No	Test Case	Input Data	Expected Result	Actual Result	Pass /Fail
1	Checking for enabling of user menu	Login with username and password.	Only menus corresponding to the user was displayed.	Only menus corresponding to the user was displayed.	**Pass**

7 SYSTEM IMPLEMENTATION

System Implementation is the part of the software engineering life cycle, where, the design artifacts are converted to a working application. Coding is done in this stage using an apt framework and programming language, which would solve the specific problem the best way. Once the design is coded into a working application, it has to be verified, validated and tested in detail. The tested product if successful is deployed in the user environment.

Successful implementation may not guarantee improvement in the organization using the new system, but it is the crucial stage in achieving a new successful system and giving confidence on the new system for the users that will work efficiently and effectively. In this phase, we can build the components either from scratch or by composition. Given the architecture document from the design phase and requirement document from the analysis phase, we can build exactly what has been requested.

This phase deals with issue of quality, performance, baselines, libraries and debugging. The end deliverable is the application product itself. There are three types of implementation

1. Implementation of a computer system to replace a manual system.
2. Implementation of a new computer system to replace an existing system.
3. Implementation of a modified application to replace an existing one using the same computer.

Implementation of "Dynamic Web Reports" comes under Third category. At the end of the specific period, the system performance and the reliability are tested as implementation is the key stage in achieving a successful new system.

8 PERFORMANCE AND LIMITATIONS

8.1 MERITS OF THE SYSTEM

The merits of the Dynamic Web reports are

1. Application can connect with any JDBC data source.
2. With minor or no enhancement can be used for any applications.
3. New modules can be added with ease without many modifications to the existing system.
4. Retrieval of data for reports will be much simpler.

8.2 DEMERITS OF THE SYSTEM

The demerits of the Dynamic Web reports are

1. User cannot view reports in 3D formats.
2. User cannot Zoom in or Zoom out reports.

8.3 FUTURE ENHANCEMENTS

The future enhancements that the project can be subjected to are:

1. Report Scheduling can be implemented, so report can be generated at the scheduled date and time.
2. Drill-down and Drill-through reports can be implemented.

9 CONCLUSION

The project **"DYNAMIC WEB REPORTS"** has been designed and developed in JSP and SQL SERVER. It is extremely user friendly and provides quick access to the necessary information.

The developed online reporting overcomes the drawbacks like resource consumption, delayed access of the existing system. The use of JSP provides an elegant interface which meets the requirements. Moreover, the project can be modified, upgraded to suit the changes in requirements or technology, arising at any point of time in the future.

The developed system is efficient because it has been repeatedly tested with the help of variety of test cases and can therefore be implemented successfully at the site of usage. Since the system has been developed using standard programming codes, rules and conventions, it is easily understandable and can be reused under similar circumstances.

Thus the Dynamic Web Reports increases the efficiency, performance of the work and user satisfaction. Finally the system is one of the dynamically configurable website that provides creation of website for any kind of users.

APPENDICES A

SAMPLE SCREENS

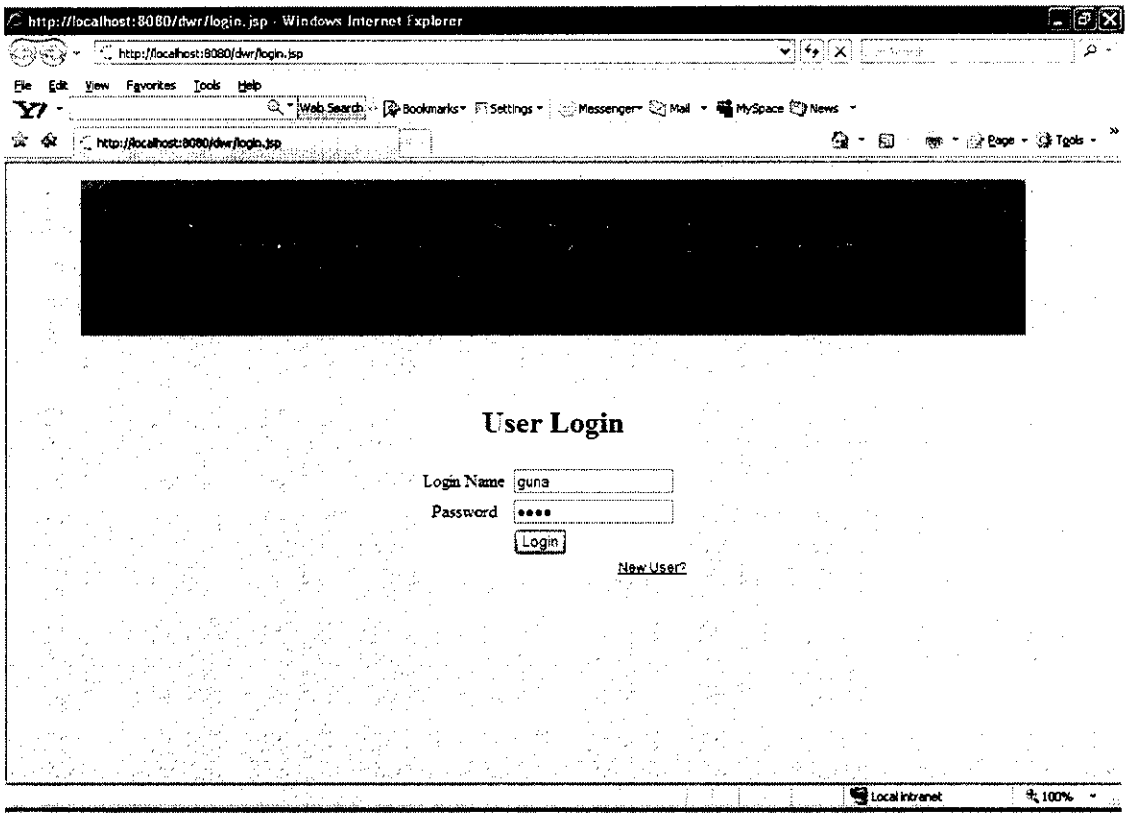


Figure A 1.1 Login Page

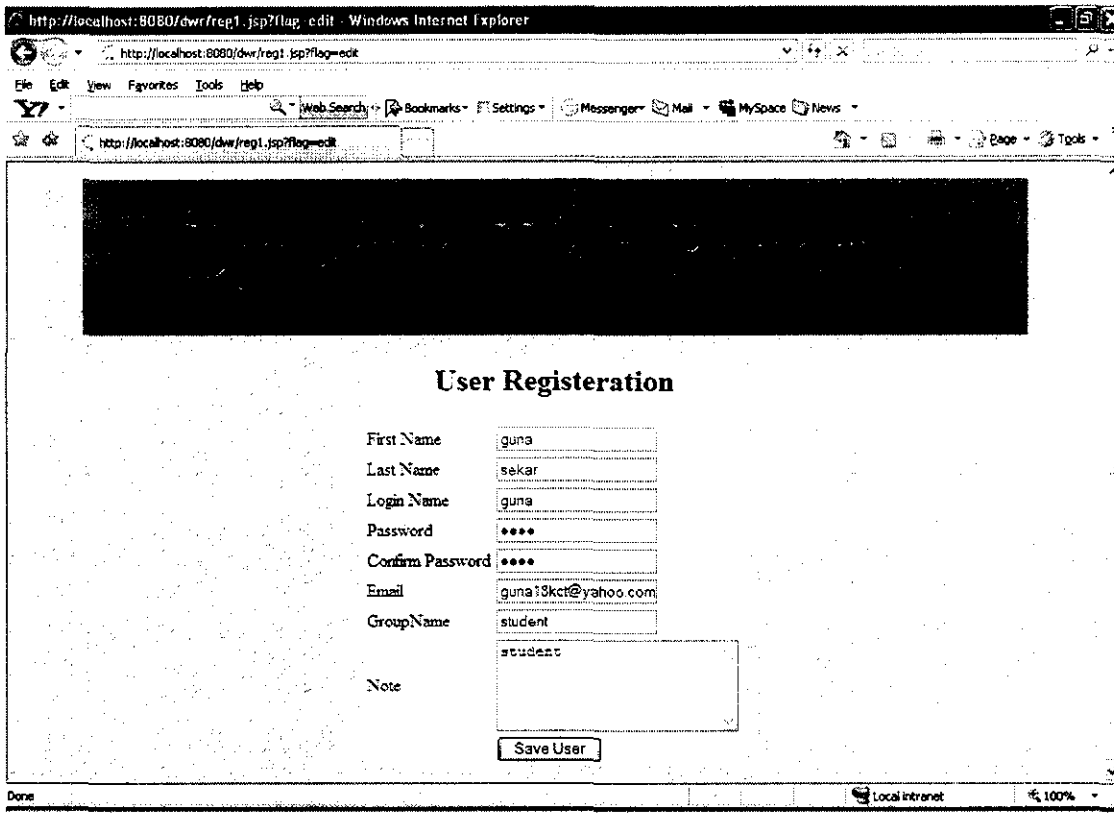


Figure A 1.2 Registration Page

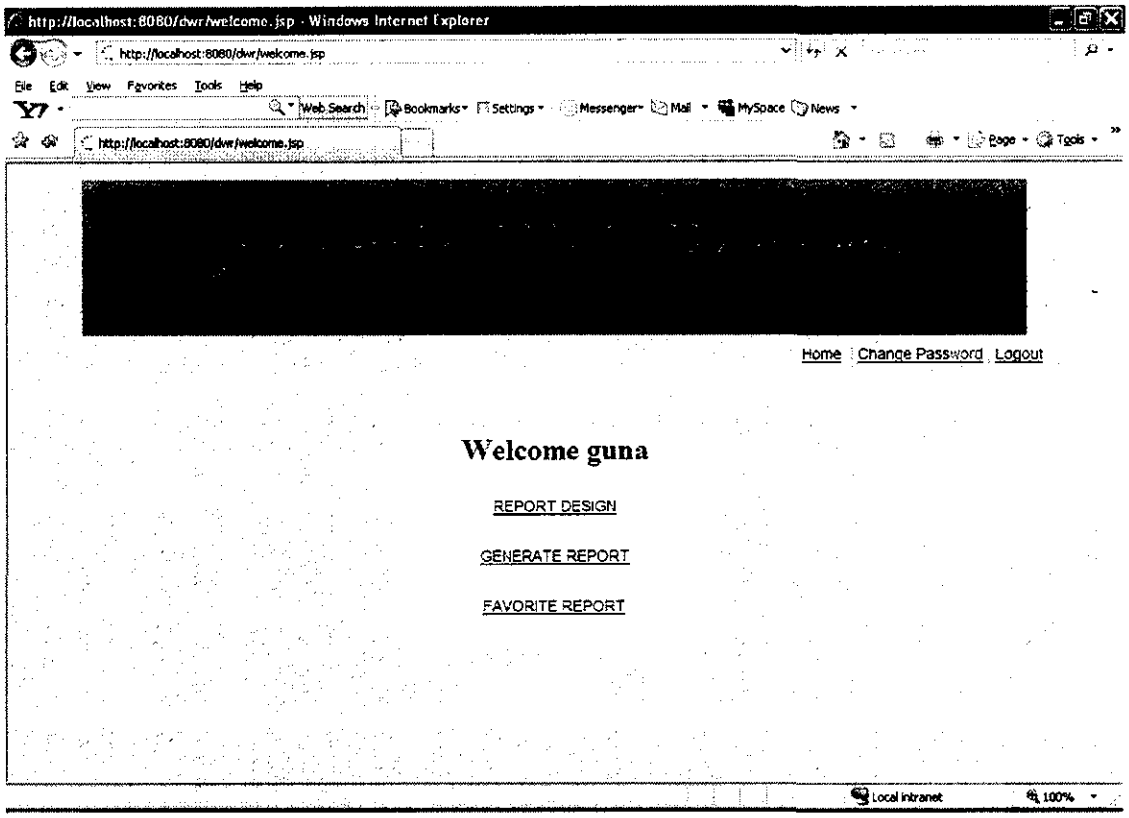


Figure A 1.3 Home Page

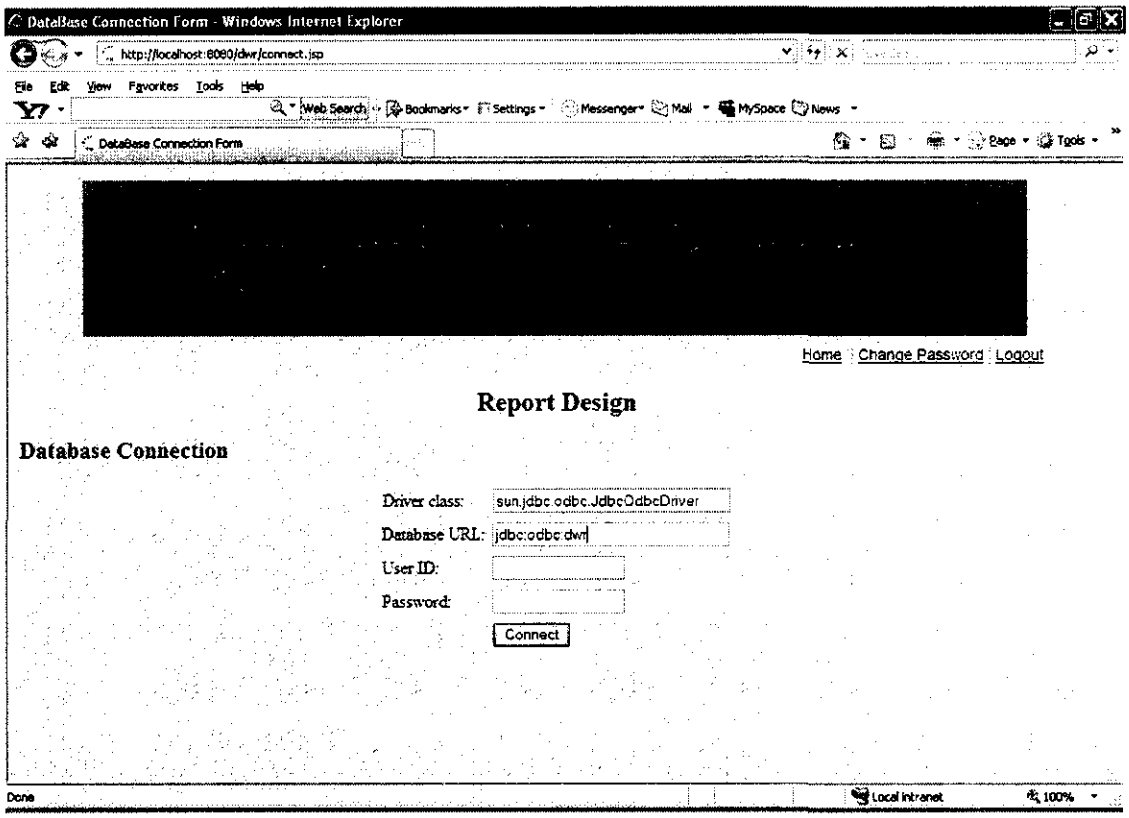


Figure A 1.4 Connect To Database

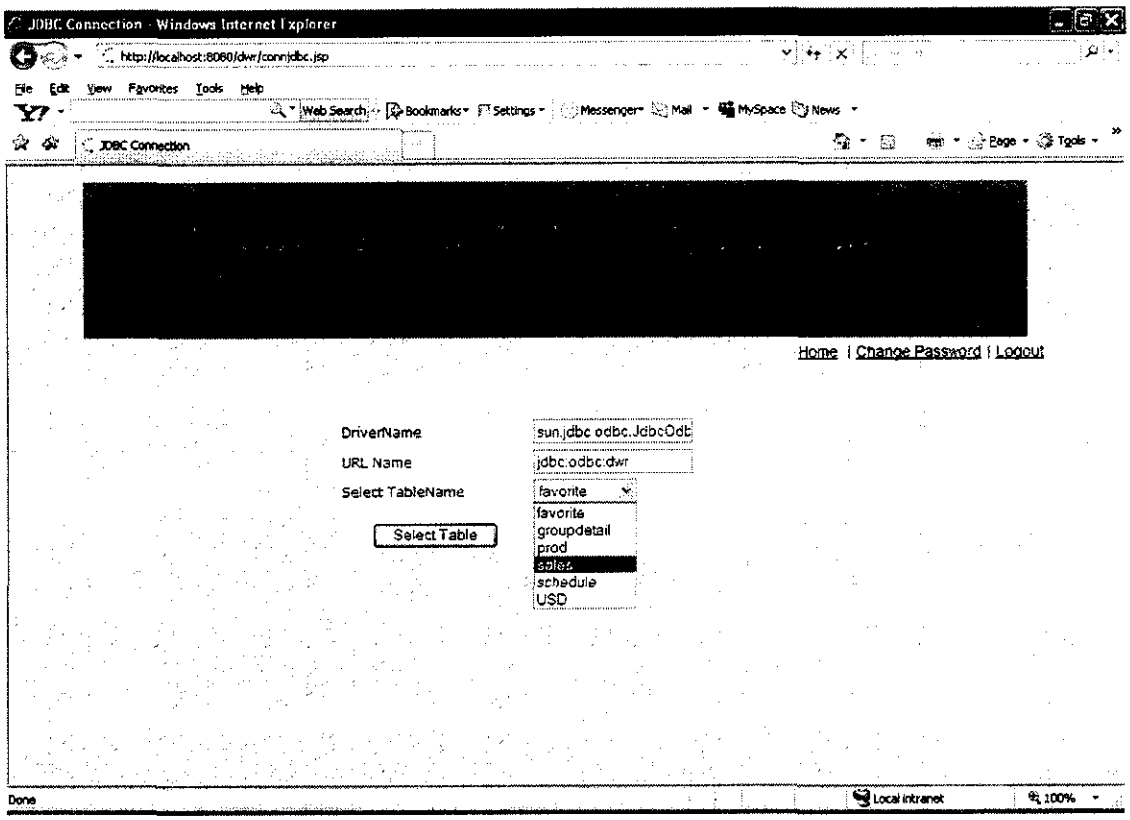
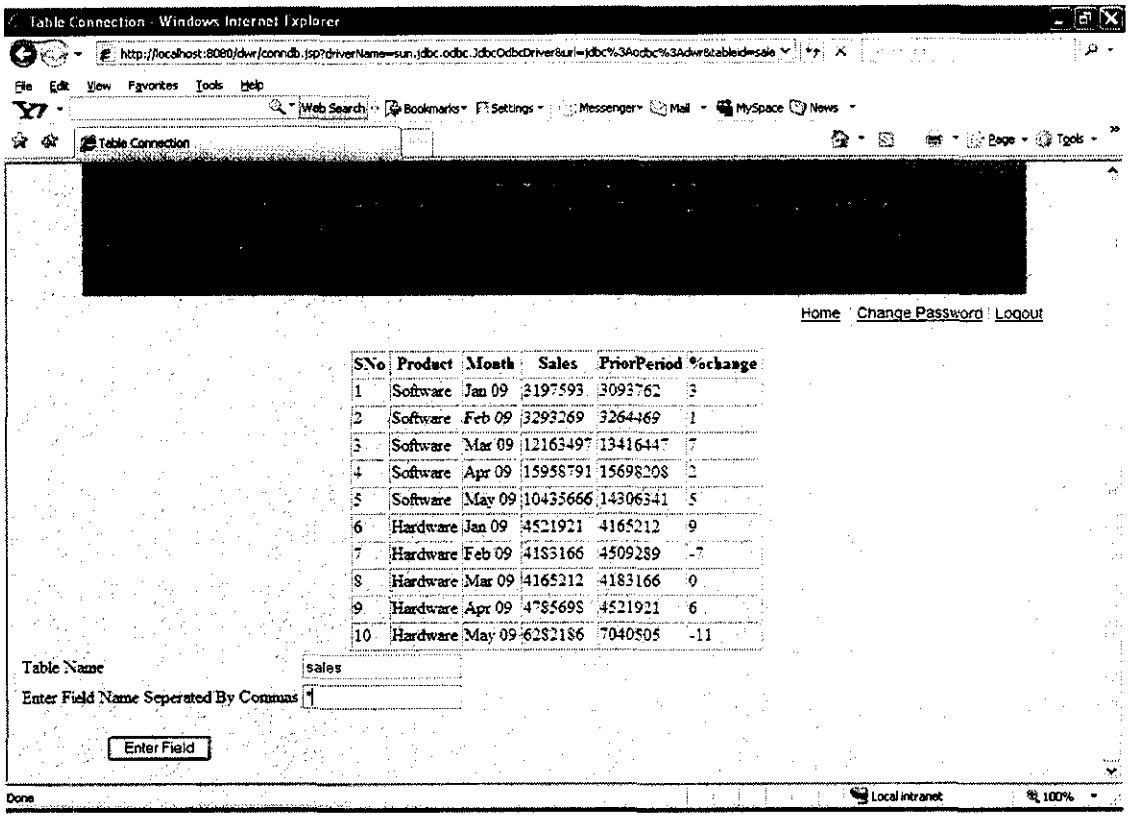
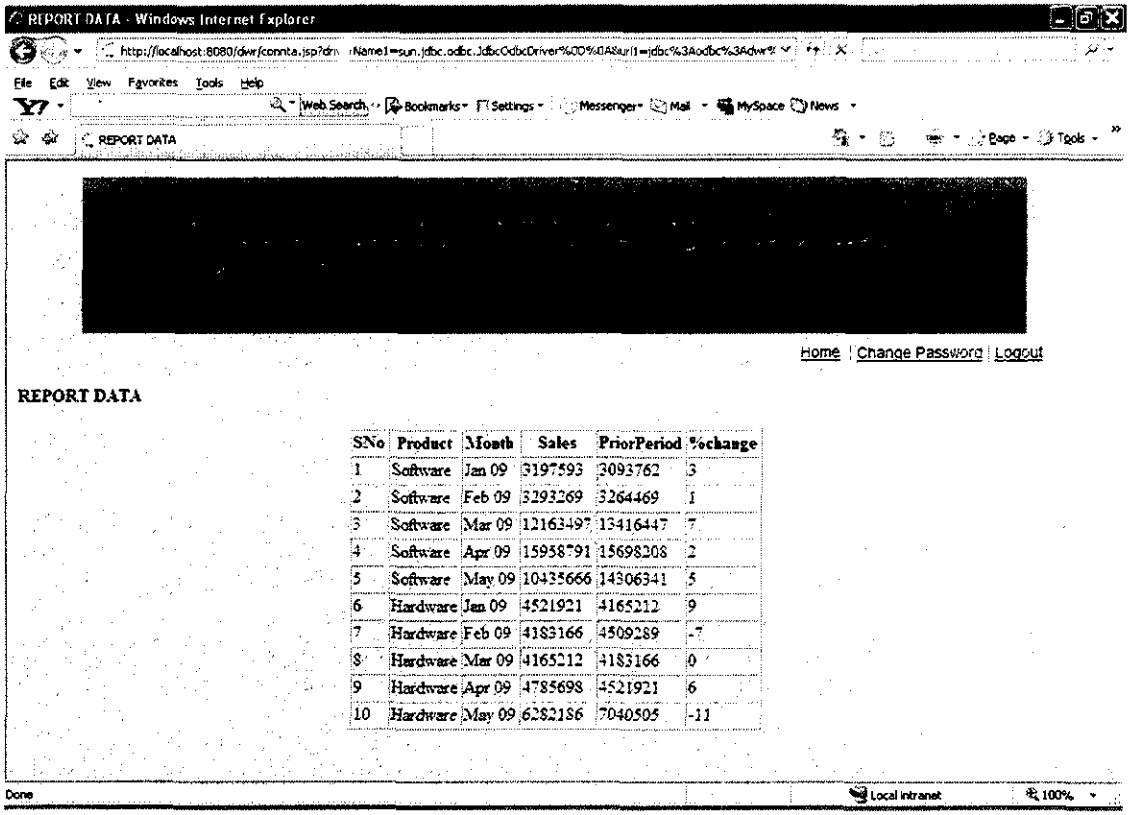


Figure A 1.5 Select Table



SNo	Product	Month	Sales	PriorPeriod	%change
1	Software	Jan 09	3197593	3093762	3
2	Software	Feb 09	3293269	3264469	1
3	Software	Mar 09	12163497	13416447	-7
4	Software	Apr 09	15958791	15698208	2
5	Software	May 09	10435666	14306341	-5
6	Hardware	Jan 09	4521921	4165212	9
7	Hardware	Feb 09	4183166	4509289	-7
8	Hardware	Mar 09	4165212	4183166	0
9	Hardware	Apr 09	4785698	4521921	6
10	Hardware	May 09	6282186	7040505	-11

Figure A 1.6 Select Table Data Field



SNo	Product	Month	Sales	PriorPeriod	%change
1	Software	Jan 09	3197593	3093762	3
2	Software	Feb 09	3293269	3264469	1
3	Software	Mar 09	12163497	13416447	-7
4	Software	Apr 09	15958791	15698208	2
5	Software	May 09	10435666	14306341	-5
6	Hardware	Jan 09	4521921	4165212	9
7	Hardware	Feb 09	4183166	4509289	-7
8	Hardware	Mar 09	4165212	4183166	0
9	Hardware	Apr 09	4785698	4521921	6
10	Hardware	May 09	6282186	7040505	-11

Figure A 1.7 Final Fields Select for Report

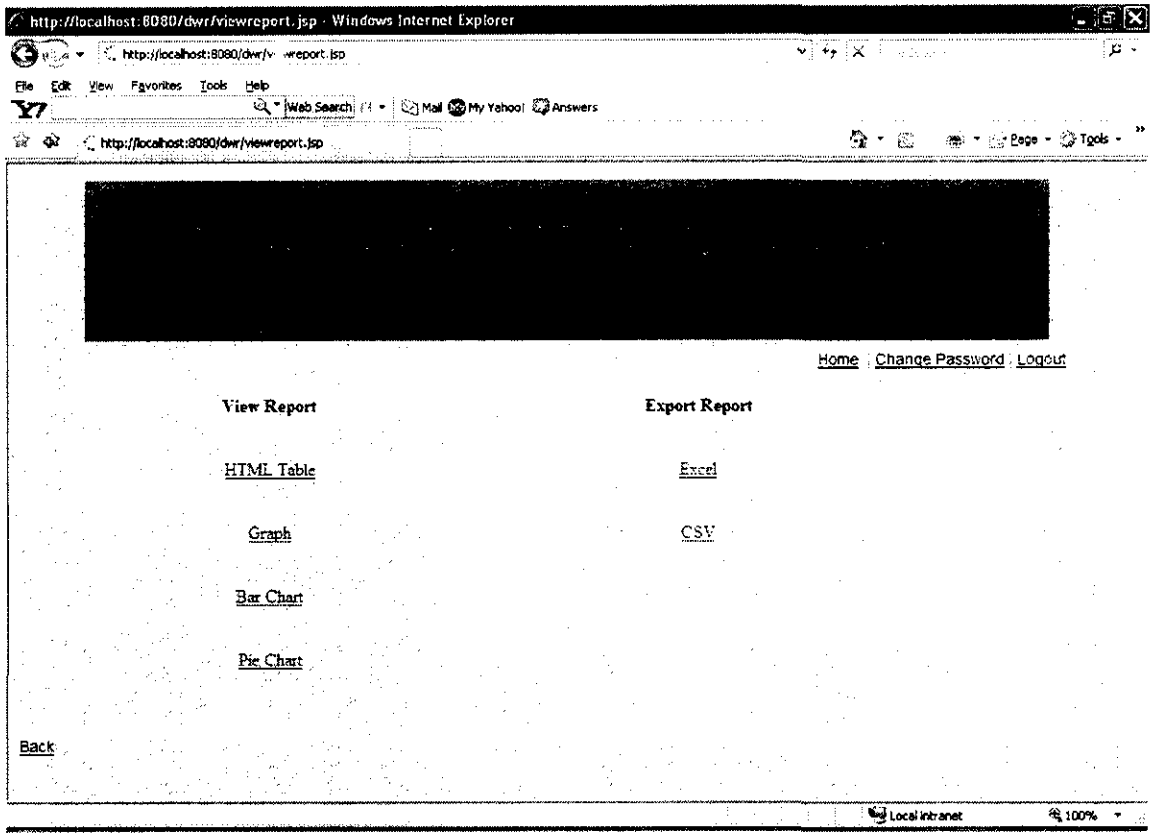
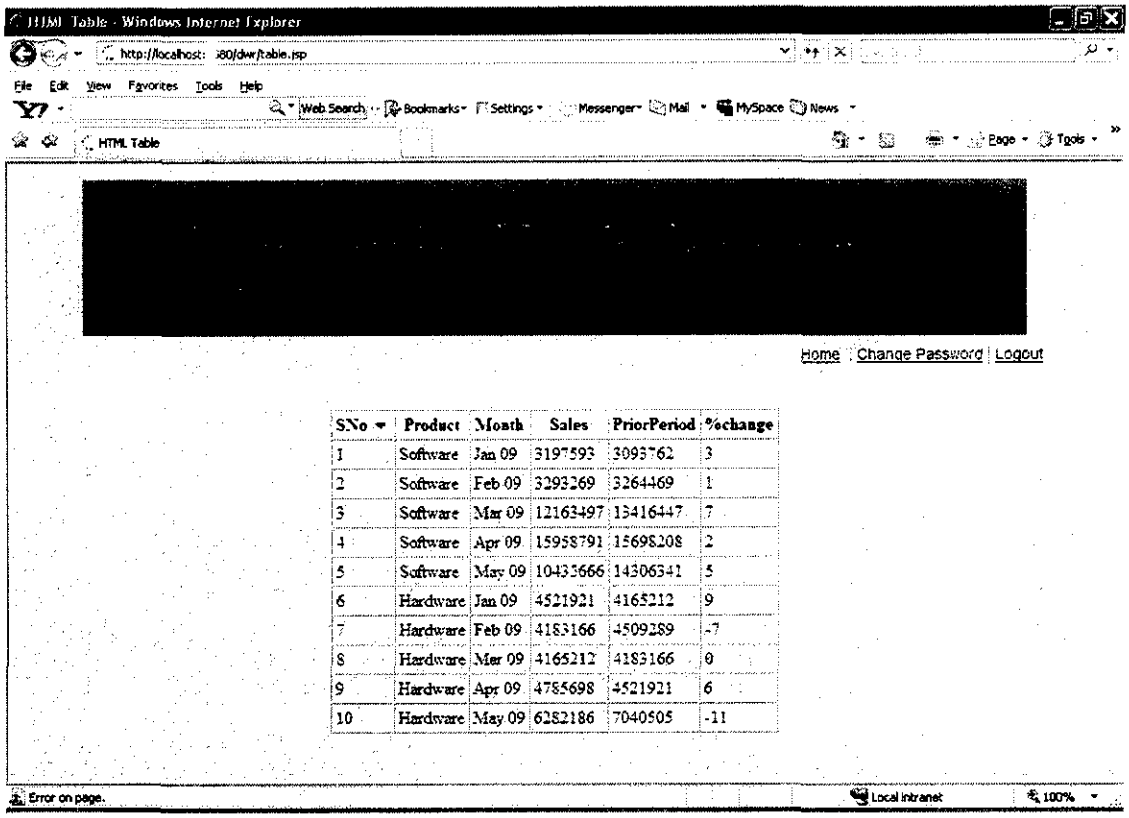
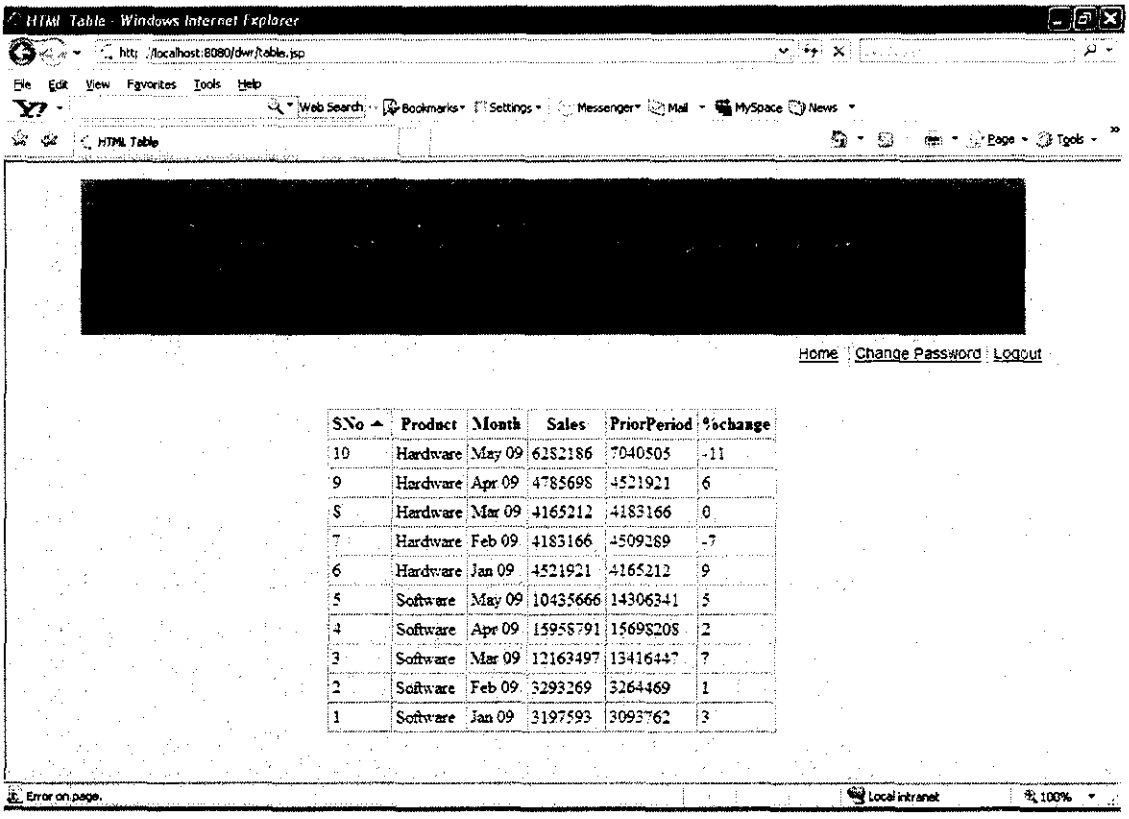


Figure A 1.8 Generate Report



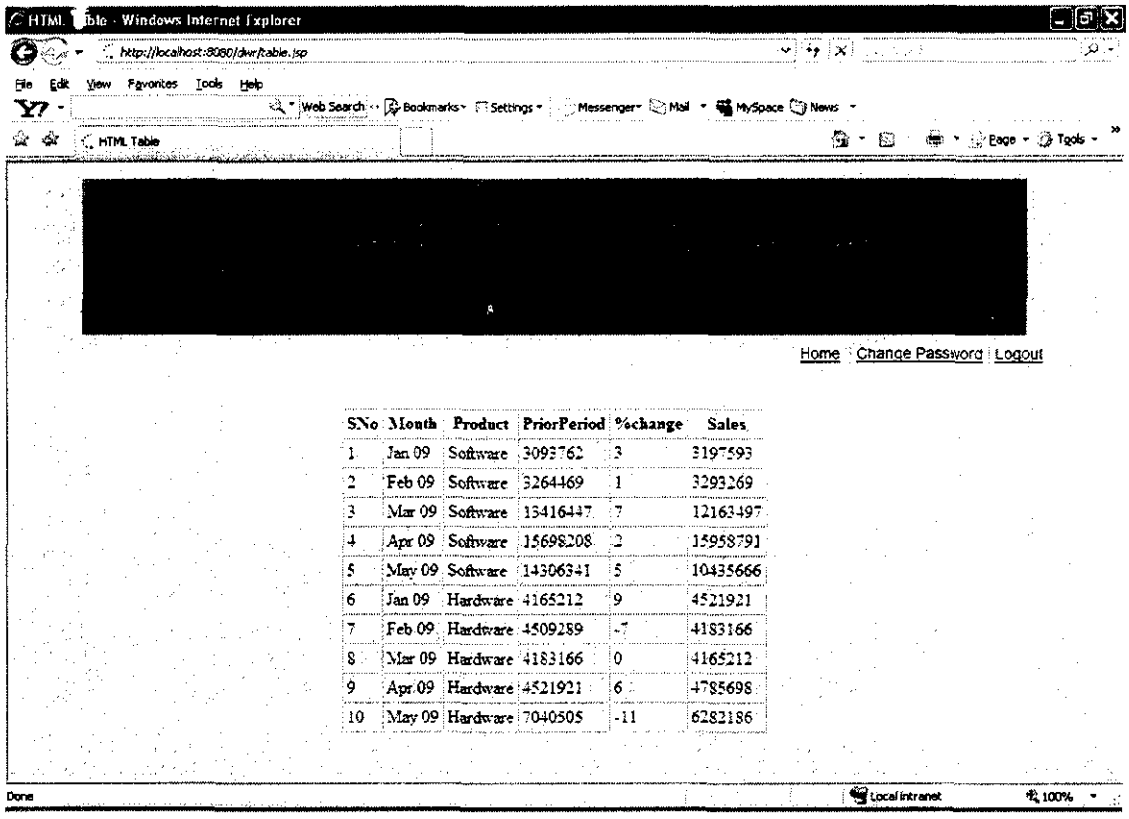
SNo	Product	Month	Sales	PriorPeriod	%change
1	Software	Jan 09	3197593	3093762	3
2	Software	Feb 09	3293269	3264469	1
3	Software	Mar 09	12163497	13416447	-7
4	Software	Apr 09	15958791	15698208	2
5	Software	May 09	10435666	14306341	-5
6	Hardware	Jan 09	4521921	4165212	9
7	Hardware	Feb 09	4183166	4509289	-7
8	Hardware	Mar 09	4165212	4183166	0
9	Hardware	Apr 09	4785698	4521921	6
10	Hardware	May 09	6282186	7040505	-11

Figure A 1.9 HTML Table Sorting Ascending Order



SNo ▲	Product	Month	Sales	PriorPeriod	%change
10	Hardware	May 09	6282186	7040505	-11
9	Hardware	Apr 09	4785698	4521921	6
8	Hardware	Mar 09	4165212	4183166	0
7	Hardware	Feb 09	4183166	4509289	-7
6	Hardware	Jan 09	4521921	4165212	9
5	Software	May 09	10435666	14306341	5
4	Software	Apr 09	15958791	15698208	2
3	Software	Mar 09	12163497	13416447	7
2	Software	Feb 09	3293269	3264469	1
1	Software	Jan 09	3197593	3093762	3

Figure A 1.10 HTML Table Sorting Descending Order



SNo	Month	Product	PriorPeriod	%change	Sales
1	Jan 09	Software	3093762	3	3197593
2	Feb 09	Software	3264469	1	3293269
3	Mar 09	Software	15416447	7	12163497
4	Apr 09	Software	15698208	2	15958791
5	May 09	Software	14306341	5	10435666
6	Jan 09	Hardware	4165212	9	4521921
7	Feb 09	Hardware	4509289	-7	4183166
8	Mar 09	Hardware	4183166	0	4165212
9	Apr 09	Hardware	4521921	6	4785698
10	May 09	Hardware	7040505	-11	6282186

Figure A 1.11 HTML Table Move Columns

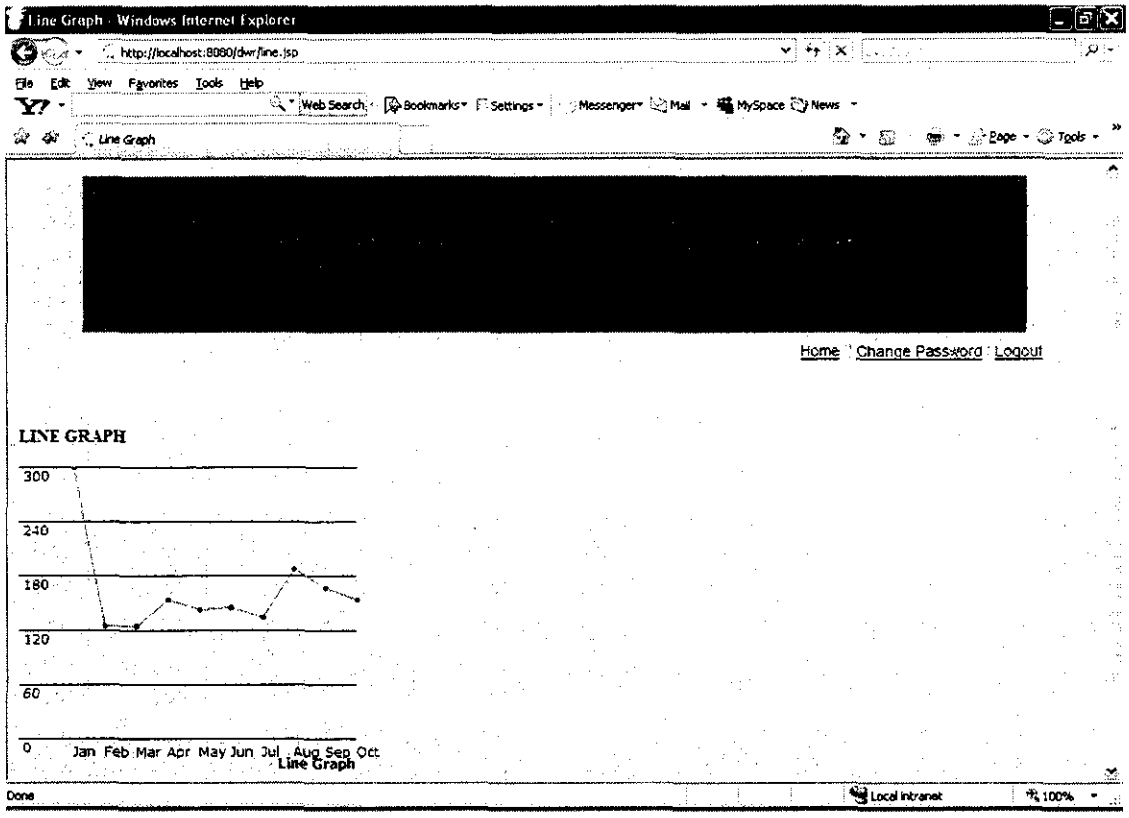


Figure A 1.12 Report In Line Graph

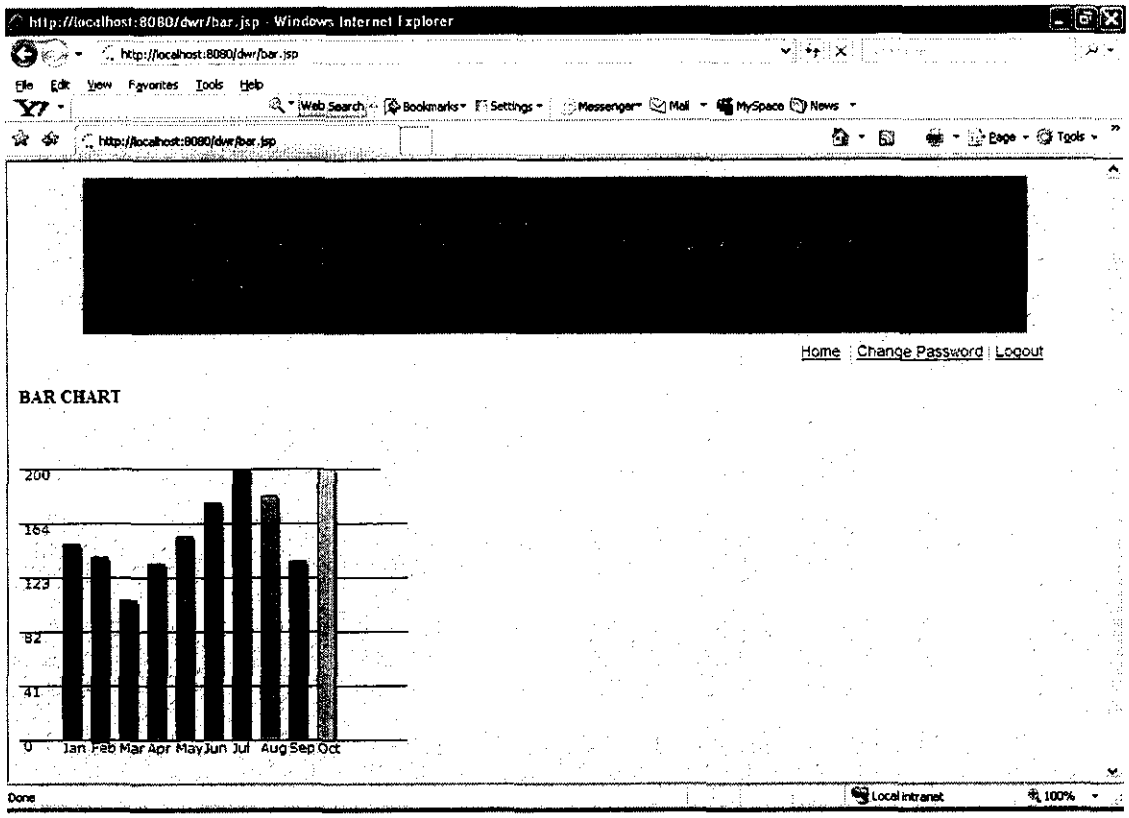


Figure A 1.13 Report In Bar Chart

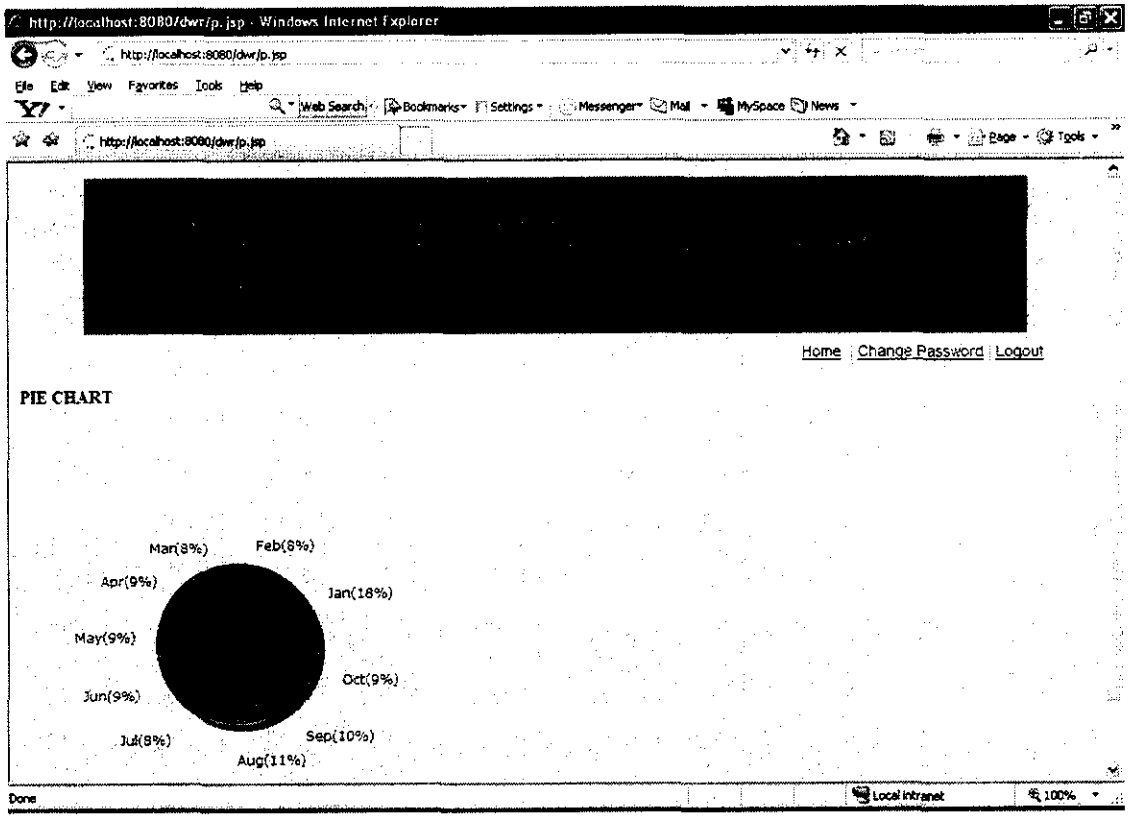
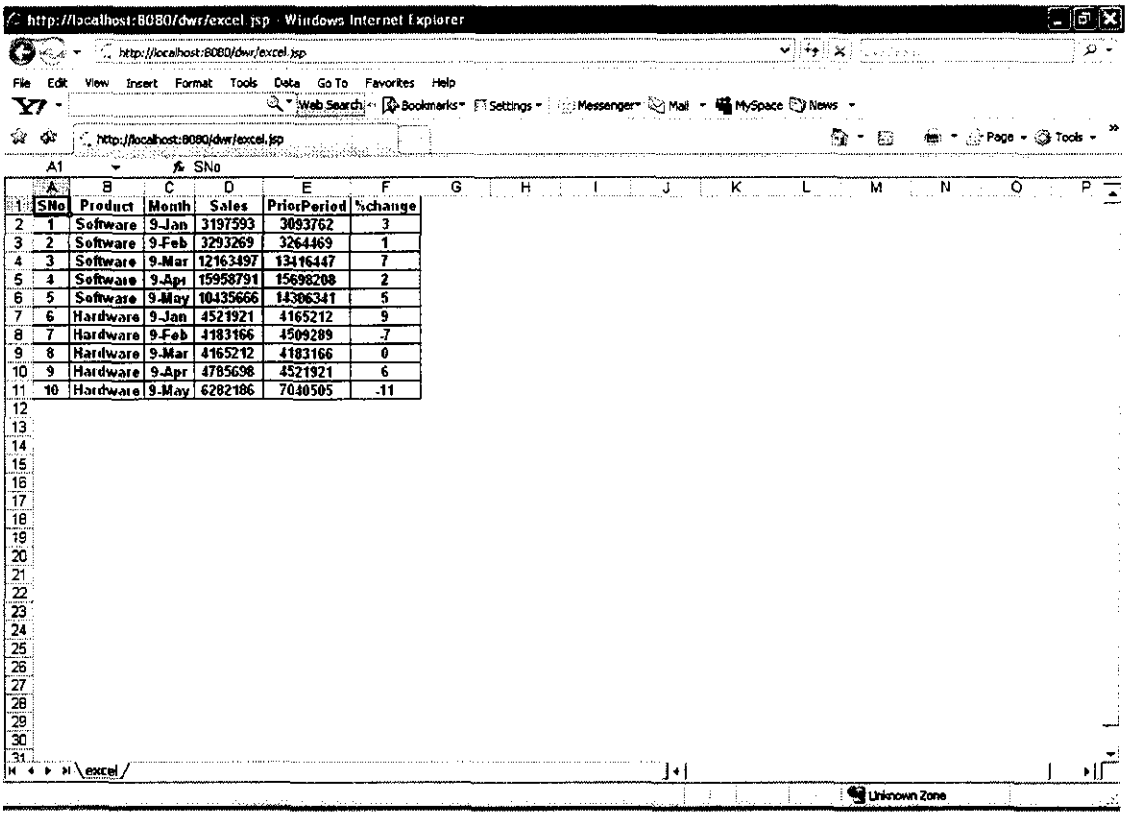


Figure A 1.14 Report In Pie Chart



SNo	Product	Month	Sales	PriorPeriod	%change
1	Software	9-Jan	3197593	3093762	3
2	Software	9-Feb	3293269	3264469	1
3	Software	9-Mar	12163497	13416447	7
4	Software	9-Apr	15958791	15698208	2
5	Software	9-May	10435666	14306341	5
6	Hardware	9-Jan	4521921	4165212	9
7	Hardware	9-Feb	4183166	4509289	-7
8	Hardware	9-Mar	4165212	4183166	0
9	Hardware	9-Apr	4785698	4521921	6
10	Hardware	9-May	6282186	7040505	-11

Figure A 1.15 Report In Excel

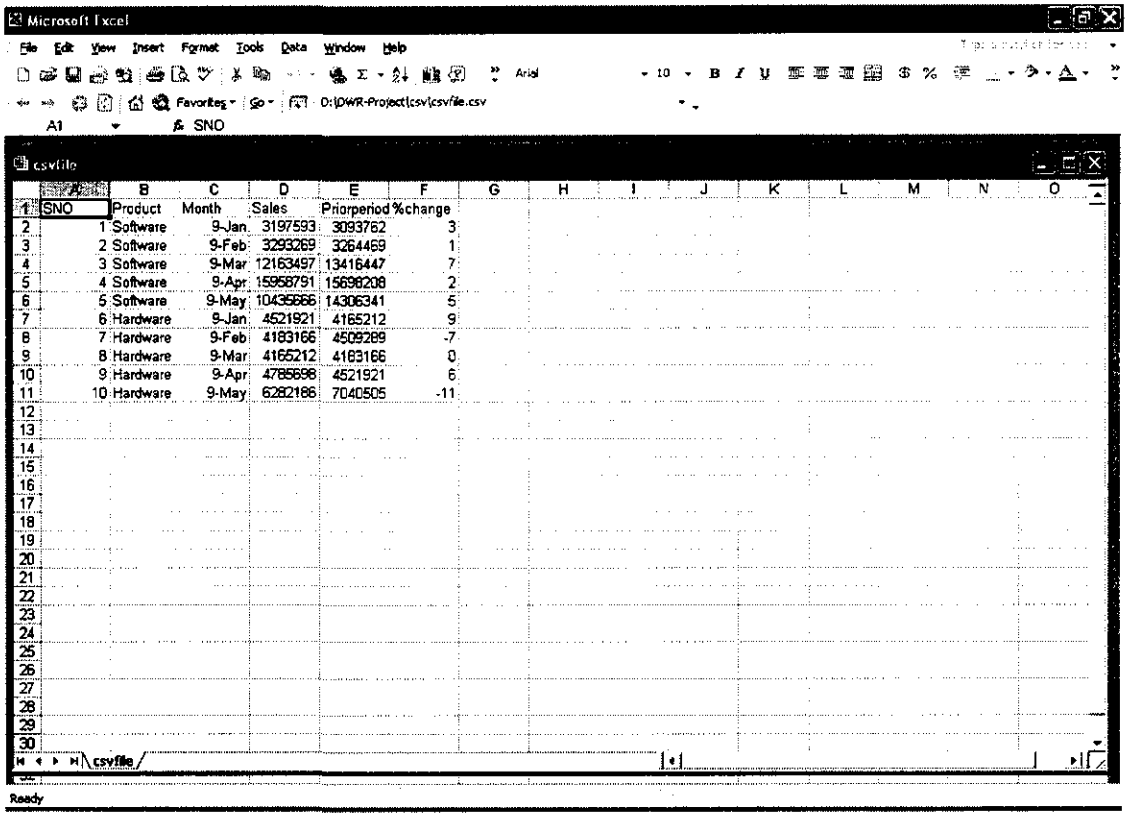


Figure A 1.16 Report In CSV

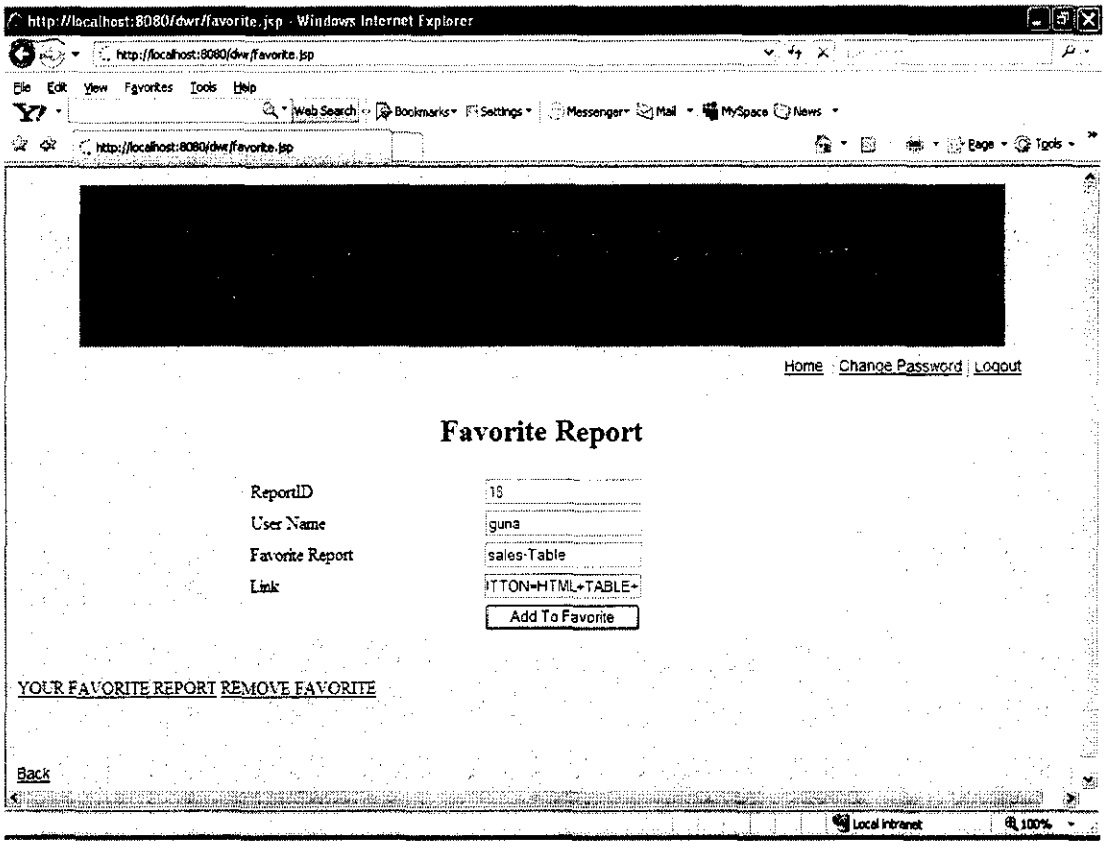


Figure A 1.16 Favorite Report

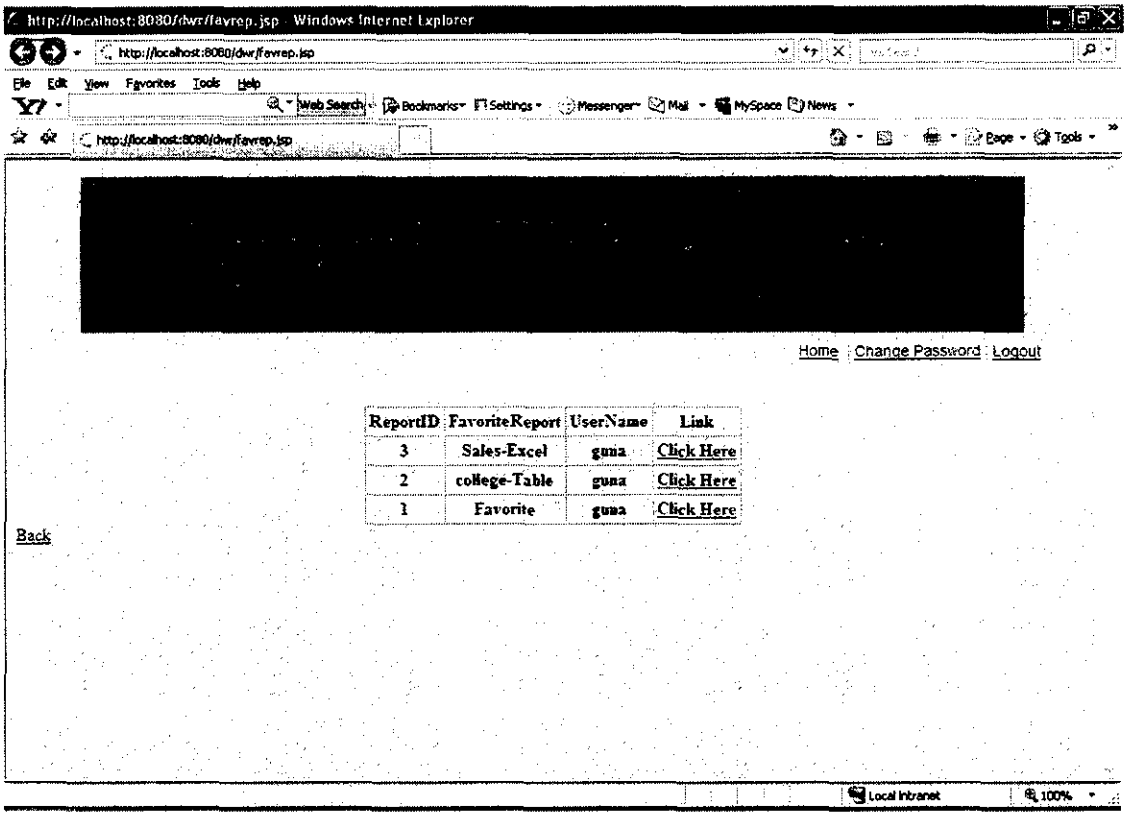


Figure A 1.17 View Favorite Report

APPENDIX B

CODING

- **JDBC CONNECTION**

JDBC code to connect to the database

PARAMEATER:

DriverName = sun.jdbc.odbc.JdbcOdbcDriver

URL = jdbc:odbc: dwr

userID = " "

pwd = " "

CODE

```
// The code is used to load the driver and creates connection with the
database.

// Get required driver name parameter
String DriverName = request.getParameter("DriverName");

// Get required database URL parameter
String URL = request.getParameter("URL");

// Get optional userID parameter
String userID = request.getParameter("userID");

// Get optional password parameter
String password = request.getParameter("password");

 Class.forName(DriverName);
 Connection  = DriverManager.getConnection(URL, userID, pwd);
out.println("Connected To Database");
```

- **JDBC code To Retrieve Access Database Table**

```
// The code is used to display all table names in MS Access Database
// Gets the database metadata
DatabaseMetaData dbmd = connection.getMetaData();

// Specify the type of object
 String[] types = {"TABLE"};

// Get the table names
 ResultSet resultset = dbmd.getTables(null, null, "%", types);
 while (resultset.next())
{
        out.println( "   "+resultset.getString("TABLE_NAME") );
}
```

- **JDBC code to Retrive MS SQL Server Database Table**

```
// The code is used to display all table names in MS SQL Server Database
// Gets the database metadata
 DatabaseMetaData meta = connection.getMetaData();

  // Specify the type of object
 ResultSet res = meta.getTables(null, null, null,new String[]
                                                    {"TABLE"});
    // Get the table names
 while (res.next())
{
        out.println( "   "+res.getString("TABLE_NAME") );
}
```

- **JDBC Code To Retrieve Any Table and display the Data View of the Table**

PARAMETER

table=sales

// The code is used to retrieve the information about the design of the table and the // data inside the table.

```
//JDBC Connection
Class.forName(driverName);
con = DriverManager.getConnection(URI,userID,pwd);
Statement  stmt = con.createStatement();
//Query to retrieve Table
ResultSet rs=stmt.executeQuery("Select * from "+ table);
ResultSetMetaData rsm=rs.getMetaData();
//To count number of column in Table
int count =rsm.getColumnCount();
%>
// Create HTML Table
<TABLE BORDER="1" align="center">
<TR>
<%
//To display column Header Name
for(int i=1;i<=count;i++)
{
        %>
        <TH><%= rs.getMetaData().getColumnName(i)%></TH>
        <%
}
%>
```

```
</TR><TR>
<%
//To display column values
while(rs.next())
{
        for (int i=1;i<=count;i++)
        {
                %>
                <TD>
                <%= rs.getString(i)%>
                </TD>
                <%
        }
%>
</TR>
<%
}
```

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