“BizFlexer” SALES AGENTS MANAGEMENT SYSTEM FOR NEW FAZIRAS ELECTRONICS AND FURNITURE

Y.S. ROCKSHAN

R141400

1414003

Name of supervisor: Mrs. Kopika Kesavathasan

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Declaration

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Y.S.Rockshan

Y Sathish Rockshan

Date: 02/11/2017

Countersigned by:

Kopika Kesavathasan

Date: 02/11/2017

Abstract

‘New Faziras Electronics and Furniture’ is a well-formed electrical, electronic items and furniture selling shop, where strong, large number of sales persons work so they were able to accomplish a lot in a short amount of time. With increasing needs, their customers’ base was expanded and that increased the number of sales agent groups. Managing sales agents became a huge task for them which need a high level efficiency and cost effective process. But manual paper based system was unable to perform with expected results along with highly time consuming and chargeable extra work.

This project is a solution to overcome client’s current situation and boost to gain their competitive advantages in their market by providing synergic performance through reducing additional workload.

Unified Modeling Language has been used for the system modeling and system development will be done based on Object Oriented Design. . Rational Unified Process (RUP) development methodology was followed throughout the software development life cycle. Microsoft Visual Studio 2015 used as development IDE with asp.net language. Data storage and management is done with Microsoft SQL Server 2008 in windows environment. Rational Unified Process (RUP) development methodology was followed in developing the proposed system. Object oriented design (OOD) and analysis techniques were used in designing the proposed system.

After several field visits with the help of evolutionary prototype, requirements were fully collected. Analysis of domain requirements result the clear design and that lead to successful construction phase. Fully tested ‘BizFlexer’ Sales Agent Management System was successfully implemented.

Acknowledgement

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List of Acronyms

API - Application Programming Interface

CSS - Cascading Style Sheets

EA - Enterprise Architecture

EL - Expression Language

GUI - Graphical User Interface

HTML - Hypertext Markup Language

HTTP - Hypertext Transfer Protocol

IDE - Integrated Development Environment

OOD - Object Oriented Design

PDA - Personnel Digital Assistant

RAM - Random Access Memory

RUP - Rational Unified Process

SDLC - Software Development Life Cycle

SQL - Structured Query Language

SVN - Subversion

UAT - User Acceptance Testing

UI - User Interface

UML - Unified Modeling Language

WWW - World Wide Web

XML - Extendible Markup Language

Chapter 1: Introduction

This chapter is about project client, problem domain, Motivation for the project, objectives of project, scope and outline of remaining chapters.

1.1. Client

Today in the modern world, the vivacity of manipulating latest technology is augmented because of to conquer the unique place in the business world. The new Faziras electronics and furniture, the client organization who lead the market in area and them wants to achieve their goals in smart and efficient manner by using "BizFlexer". For the above purpose "BizFlexer", a simplified software solution designed with intensions to achieve competitive advantages in the scope of sales agent's management.

1.2. Problem Domain

Lots of paper work was carried out of organization employees in order to maintain the business information such as sales management details, agent management details and budget details .But the main problem occurred by using loads of paper work has been in caused to heavy draw back in their workflow practices because of staff members have to put extra effort on particular data to get certain business information. These extra work has been effected to the efficiency of organization's day today work routine because these majority of the jobs were highly time consuming and costly. Huge collection of duplicated data was stored by organization to fulfill their current requirements.

"BizFlexer" Sales agents' management system provides an automated solution for the compulsory business processes to fulfill the regular business needs. To encourage green computing, manual paper work has been replaced by "BizFlexer" and also it is designed to generate real time reports which cut off the time and people costs put up on extra efforts. "BizFlexer" saves storage because of they need not to carry extra duplicate data storages.

"BizFlexer" had been cost effective solution for the organization they can save huge Range of time, energy, storage space and also monetary gain. So that, after the successful Implementation of the system, organization promises to use saved money for good deeds

such as funding on social merits.

1.3. Motivation for the Project

The huge development in ICT seen in the citified area nowadays, gives a great opportunity for the business industry to attract people to spend lots than past. Sales matters arise both urban and country area with huge needs of modern society. They must properly manage with an efficient and an effective manner to get the maximum benefit of this expansion. So it is necessary that ICT must come into action to solve technical barriers in country areas and reduce business gaps between urban and country areas.

Not like urban area, client has to do lots of paper work for maintaining the business because of they do not have well defined business solution to reduce the wastage with the existing manual system .The client can expand the resource pool with a proposed solution to get maximum output from their limited resources.

Local businesses from a to z contributes to local economic excluding the size of it .So it is essential to remove technical barriers and establish modern ICT involvements in country areas. It will increase IT as well as non- IT related opportunities of these country areas.

Our intention is to provide a software solution which highly available through many platforms, Generate reports with strong decision making indicators to high level management, reduce wastage with time and cost by removing traditional methods, and improve employee efficiency with customer Involvement, providing a quality and standardize service.

1.4. Objectives of the Project

Replace paper work with new automate solution by October 29 to achieve organizational goals efficiently and effectively. Generate highly accurate reports that support to make visionary decisions for top management.

Help the client to manage his revenue that he earned through the business by controlling and automate the business process and the ultimate goal of developing 'BizFlxer' is to gain better client satisfaction by attaining their competitive goals in an efficient way.

1.5. Scope of the Project

Achievable objectives in sales agent management domain is as follows:

- Sales transactions, budgets, agent management and business operations handling
- Manage process controls such as price book and invoicing.
- System user authentication and authorization management through menu handling, defining access group and permission controlling.
- Generate multi dimension reports such as operational report, daily transaction reports and also summary reports.

1.6. Outline of the Chapters

Outline of the chapters contains brief introduction about following chapters.

- **CHAPTER 2: ANALYSIS**

In this chapter, mainly consider about facts finding techniques, process and functionalities of current paper based system, functionalities of existing similar solutions, functional and non-functional requirements.

- **CHAPTER 3: DESIGN**

In Design chapter, Alternative Technical solutions, Justification for the selected Technical Solution, object oriented techniques behavioral and structural Diagrams, UI design and database design used in order to satisfy functional requirement of "BizFlexer" through technical operations.

- **CHAPTER 4: IMPLEMENTATION**

Chapter four is mainly discussed about implementation environment, major code and module structures, reusable components, development tools, platform dependence and important codes that used to develop the 'BizFlexer'.

- **CHAPTER 5: EVALUATION**

Evaluation chapter is explained about how to evaluate the quality of the 'BizFlexer' using Test plans, Test results and user evaluations such as (UAT) etc.

- **CHAPTER 6: CONCLUSION**

This chapter is about the summary of the project, critical assessments of the system and future of 'BizFlexer' Agent Management System.

Chapter 2: Analysis

2.1. Introduction

In this chapter, mainly discuss about followings:

- Fact gathering techniques which helped to find requirements.
- Analyzing existing system using a top level use case diagram.
- Review of existing similar solutions.
- Functional requirements of the proposed solution.
- Non-functional requirements of 'BizFlexer 'agent management system.
- Selected methodology analyzing.

2.2. Requirement Gathering

Requirements were clearly identified using fact gathering techniques which contained highly time consuming activities. Such as;

- Field visits
- Observation
- Interviews
- Prototyping

Field visits and Observations

Number of field visits had to proceed to acquire required facts for defined scope. Observation techniques were carried out to capture the working styles that followed by the client with paper based manual system. Documents and existed procedures were helped to gain proper domain knowledge.

Interviews

Well experienced employees who have great knowledge in paper based manual system were interviewed in order to gather information on functionalities of old system.

Prototyping

Prototyping act major role in fact finding because automating manual process was mutually bonded with user practices .Most of the important decisions were took in this technique. Prototyping was the feeder for designing and constructing phases.

2.3. Current System Analysis

Client had no well-defined system to handle sales agent management activities. Lack of management caused to huge stress certain users because they had to remember several activities. Considering the point that huge number of transactions which can happened in a day, the organization face number of difficulties when managing sales and possibility of missing data can also happen. Paper based manual system created extra jobs and costs which break their efficiency as follows.

- Huge paper based activities cause difficulties in collaboration activities.
- Manual updating, searching were not easy with duplicated information's.
- Poor calculations, communication amphibology and weak information flow.
- Not a centralized data capturing system, information stored in several places and that denied the data access.
- Poor reporting styles resulted complex and unreliable information about daily transactions, evaluating sales revenue, budgeting and analyzing summaries.

Below ***Figure 2.1.: Current System - Top-level Use Case Diagram*** Describes current system.

Figure 2.1.: Current System - Top-Level Use Case Diagram

System management functionalities can be done through several types of managerial roles which described in following section.

Sales manager

- Responsible for manage agents, budgets and targets to accomplish these responsibilities accurately reports were mandatory to monitor under various filters.
- Under sales manager assigned sales tasks were performed by sales agents.

Monitoring and evaluating performance was compulsory to get competitive advantage but with old manual system that was highly time consuming process.

Inventory manager

- Responsible for inventory management.
- Under inventory manager inventory officer works for inventory and product management

Inventory employees put their maximum effort to keep sales styles but to improve their market sales trend forecast is essential.

Under analyzed fact derived organizational structure is as follows.

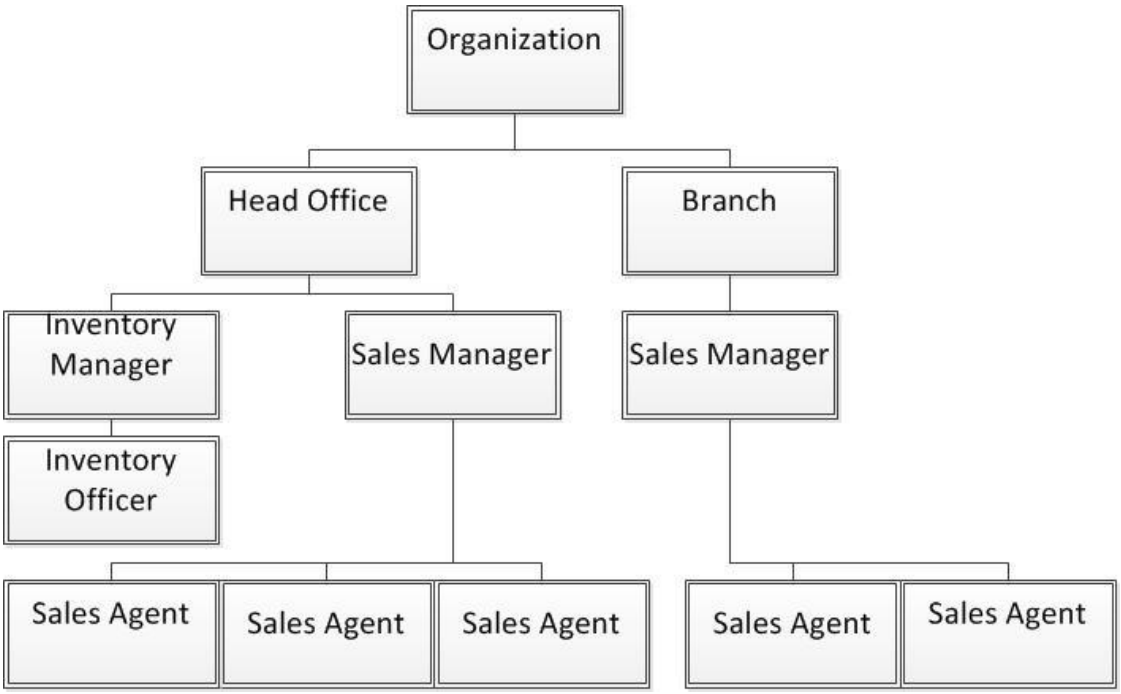


Figure 2.2.: Current System – Organization Structure

2.4. Existing Similar Solutions

There were many solutions can be found through the Internet. Analyzing those solutions help to create good product with latest features. For the client directly using these software not possible because of high cost and lack of knowledge in customize according to their requirements.

- **Codecanyon**

The following ***Figure 2.3.: Similar solutions for the current system – Codecanyon*** shows the interface of Codecanyon website and Codecanyon is a famous and well-known sales agent management system. With Codecanyon following functionalities that user can experience:

- User authentication and authorization control.
- Sales agent define.
- Sales forecast.
- Commission handling.
- Product management.
- Price book.

- Invoicing.
- Stakeholder category management.
- clearly generated reports.

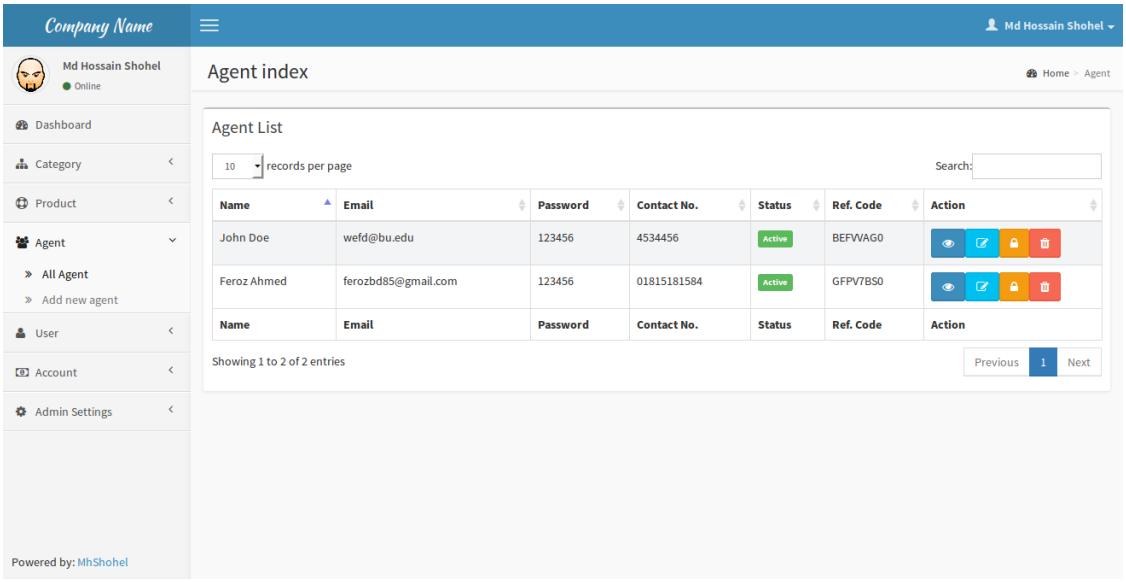


Figure 2.3.: Similar Solutions for the Current System – Codecanyon

- **Bitrix24**

Bitrix24 is another sales agent management system using in foreign countries. It manage the sales agents and inventories. There were many similar functionalities such as;

- Access rights.
- Sales agent define.
- Absence, leave request.
- Commission handling.
- Product management.
- Document management.
- FAQ facility.
- Product views with sorting facilities.

Figure 2.3.: Similar solutions for the current system – Bitrix24 below shows the interface of Bitrix24 website.

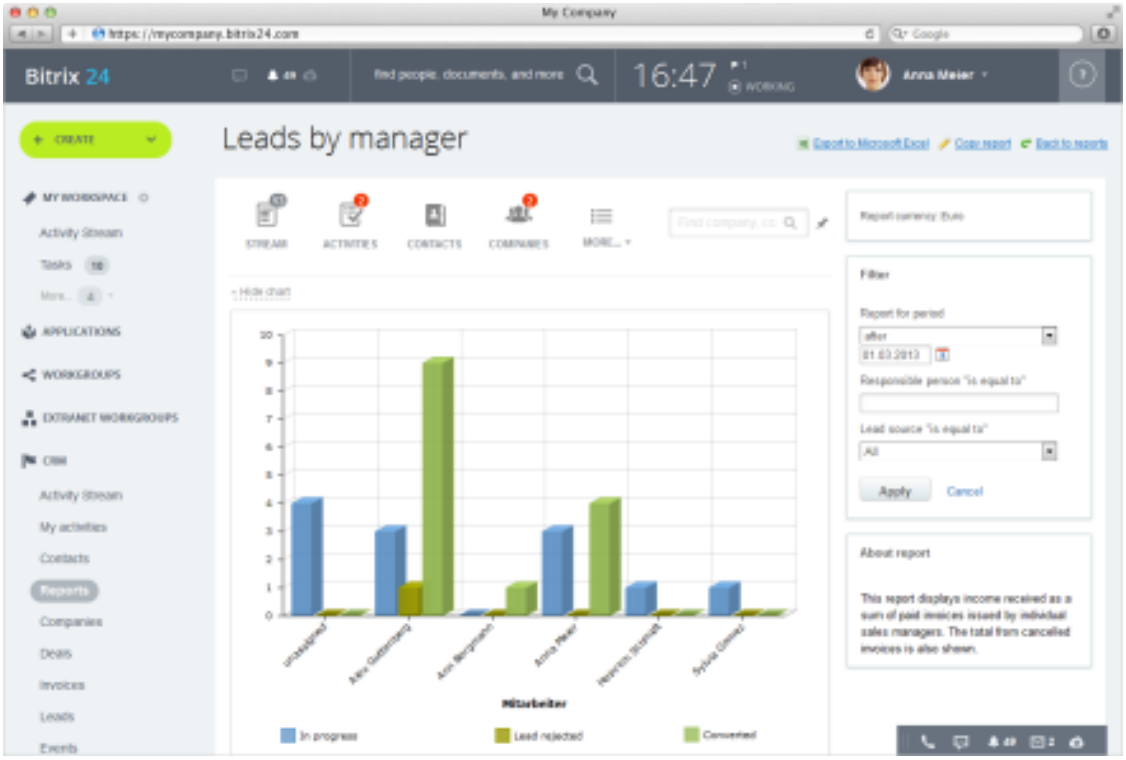


Figure 2.4.: Similar Solutions for the Current System – Birix24

2.5. Requirements

Studying problem domain and analyzing it deeply helped to acquire client's abstract requirement .Functional requirements and non-functional requirements were two categories which acquired requirements can be grouped.

2.5.1. Functional Requirements

Functional requirements are about what 'BizFlexer' should do. Such as:

- Authentication and authorization.
    - User should have to create an account to gain allowed facilities provided By the system.
    - To login into the system user have to use unique name and password.
    - Entering user name and password will allowed system access to users.
    - 'BizFlexer' allows user to define user groups.
    - Assign screen permissions.
    - Navigation management allows user to navigate through permitted screens.

- Modify stakeholder details.
  - Successful login into the system, can perform facility to update their account information.

- Agent management facility.
  - Define sales agents
  - Login into the system, can execute specified agent management tasks.

- Sales trend forecast facility.
  - Estimation possible through the system for a specific time period for selected sales products.

- Sales budget facility.
  - Scheduling expected sales can be done.
  - Forecasting is input for budget.
  - Budget can used to determine how many units have to be produced.
  - Organization of sales is easy.

- Commissioning facility.
  - Agent wise commission calculating.
  - Calculating commissions according to single fixed rate.
  - Multi rate slab wise commission calculating
  - Cumulative value of commission for accomplished targets can be derived.

- Sales target facility.
  - Divide sales in to several sub sales.
  - Allocate certain agent to specific sub sales.

- generating timely reports.
  - Mangers can view reports that support to take decisions.
  - Sorting is possible as they requirement.
  - List the manageable master details.
  - List the stakeholder details.

2.5.2. Non-Functional Requirements

Non-Functional Requirements were indicators that indicate the quality of the system and it can be used to judge the operation of the system.

- Availability.
  - Highly available system it helps to reduce reworks.
- Simple interface for viewers.
  - Well organized content with essential information.
  - Easy navigation to fast execution.
  - Complexity reduced screens.
  - Interfaces with comfortable colors to eyes.
  - Using quality graphics.
- Highly usable.
  - Easy to use.
  - Quick execution.
  - Errorless execution.
  - Long term execution.
- Reliability.
  - Reports with reliable content.
  - Accurate calculations.
- User understandability.
  - Organized content layout and navigations.
  - Use meaningful icons and symbols.
  - Provide more understandable information.
- Highly Maintainable.
  - System should be easy to maintain with minimal effort.
  - Use loosely coupled objects for a high level change acceptable system.
  - Changing does not interrupt existing user tasks.
- Accurate.
  - Provide correct information.
  - Timely information.
- Security and Data integrity.
  - Highly secured login to access confidence details.

- Authorized updating with high data integrity.

2.6. Selected Methodology

There are numerous software development methodologies which can be used to development of software according to project requirements. Software development methodology that used to develop 'BizFlexer' is described in this section.

- **Rational Unified Process**

Rational Unified Process (RUP) was selected as developing methodology of the proposed solution. RUP executed thorough four phases and namely they are inception phase, elaboration phase, construction phase, and transition phase showing as ***Figure 2.9.: Rational Unified Process (Pic. from wikipedia.org)*** below.

- Inception Phase: Field visits, interviews were happened in order to gather business requirement and collaborating with client helped to plan future activities.
- Elaboration Phase: Results of inception phase used in elaboration to expand the visibility of requirement. For this design models were used.
- Construction Phase: Evolutionary prototypes were continuously developed while integration and acceptance test were conducting.
- Transition Phase: In transition phase 'BizFlexer' moved development into production. After system validating and testing few site visit were happened according to user training.

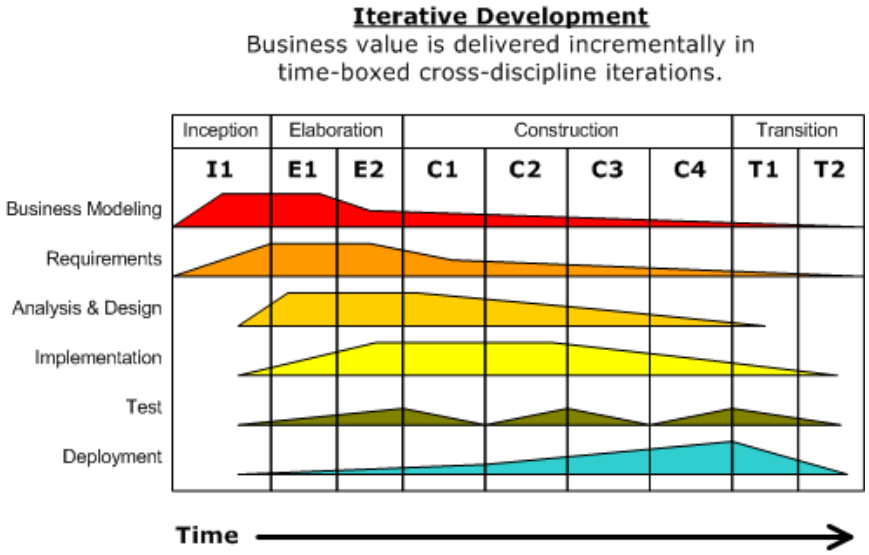


Figure 2.5.: Rational Unified Process (Pic. from wikipedia.org)

Chapter 3: Design

3.1. Introduction

Analyzed and explored requirements were converted into explainable designs in order to computerize the abstract client requirement. Chapter 3 design is an explanation of designs that used to develop the 'BizFlexer' agent management system.

3.2. Alternative Technical Solutions

Giving a solution can be done in various methods but the thing was cost effectiveness and productivity that achieved by the solution. Agent management is also can be implement in various technical approaches.

- **Network Based System**

Local Area Network (LAN) or a private network use to coordinate the activities of set of computers which were allows share data among them, define security policies and many more network functions.

- **Modify open source software or purchasing software**

Modifying open source software is a highly time consuming process which need expert knowledge to gain client satisfaction.

Purchasing commercial product is not a cost effective solution for the client because rareness and expensiveness of commercial agent management products

- **Web Based System**

An information system uses Internet web technologies to transfer information and services to users and other information systems or applications. The main purpose of this software system is to publish and maintain data by using hypertext based principles. When we are going to develop the system, there are available alternative technical solutions such as standalone application, network based system and web based system.

3.3. Justification for Selected Technical Solution

Agent management is can be done in vast range of devices as client requirement for an example client can operate the system anywhere in the world using a PDA so browser based web solution was selected and standalone solution method worthless for this

requirement. Project scope time frame is limited and using expert knowledge was not practical for open source modification in client environment. Expensive commercial products were not chosen because of estimated budget not feasible. Client side Microsoft based working procedure favored the future solution implementation through asp.net and MsSQL server.

3.4. Architecture

"N-tier architecture is probably one of the most used architecture models in the industry. It is used so often because it's scalable, extensible, secure and maintainable over time. It also helps the developers with different roles to better do their job without interfering with each other.

- **Entities Layer**

- The Entities layer contains all the entities that are used in all the other projects of the application such as table mappings from database, DTOs (Data Transfer Objects) or ASP.NET MVC Models. Most of the classes in this layer are POCO (Plain Old CLR Objects).

- **Data Access Layer**

- The Data Access layer contains functionality for Creating, Returning, Updating, Deleting (CRUD) items into the database. In this layer we can use technologies like ADO.NET, nHibernate or Entity Framework.
- The entities or the database table mappings classes needed for the above operations will be referenced from Entities layer described above.
- This layer should only be shared by the Business Components layer. In Visual Studio, the layer will be represented by a "Class Library" project type.

- **Business Component Layer**

- The Business Components layer contains all the core functionality of the application. The purpose is to hold all the custom logic that is applied on the methods that are exposed from the Data Access Layer before they are referenced in the Presentation Layer or the Services Layer. Operations like converting arrays to lists, mathematical calculations or variable conversions are made in this layer.

- The entities needed for the above operations will be referenced from Entities layer and the database operation methods will be referenced from Data Access layer.
- This layer should be shared only by the Presentation Layer or the Services Layer. In Visual Studio, the layer will be represented by a "Class Library" project type.

- **Services Layer**

- The Services Layer gives you the possibility to expose the Business Components Layer as an API to third party systems.
- For example, if you want to share with a mobile application some data about the products that you have in your database, this layer should be responsible for that. However, this layer is not a mandatory one. If you consider that your application will not share data with another system, then this layer should not be created.
- As I said earlier, the methods that are needed to be exposed in this layer are referenced from the Business Components Layer and this layer should only be shared by the Presentation Layer and other third party systems.
- In this layer you can use technologies like WCF Services, Web Services or ASP.NET WebAPI.

- **Presentation Layer**

- The Presentation Layer is responsible of hosting the user interface of your application. As an example, in this layer you will have all the .aspx pages and .ascx user controls along with JavaScript and CSS files. The methods responsible for getting data from the database will be referenced only directly from Business Components layer or from Services layer.
- In this layer you can use technologies like ASP.NET Web Forms or ASP.NET MVC.

- **Common Components Layer**

- The Common Components Layer contains all the common libraries or functionality that can be used in any of the above layers. For example: validation functionality, security libraries, encryption tools or exception logging classes can be added to this layer.
- This is an optional layer and it is mandatory not to have any dependencies on the above described layers because this layer can be compiled and shared across multiple projects." [1]

The detailed Web N-Layerd architecture deppicted by the following *Figure 3.1.: web N-Layered Architecture (Pic. from dotnetdaily.net)*

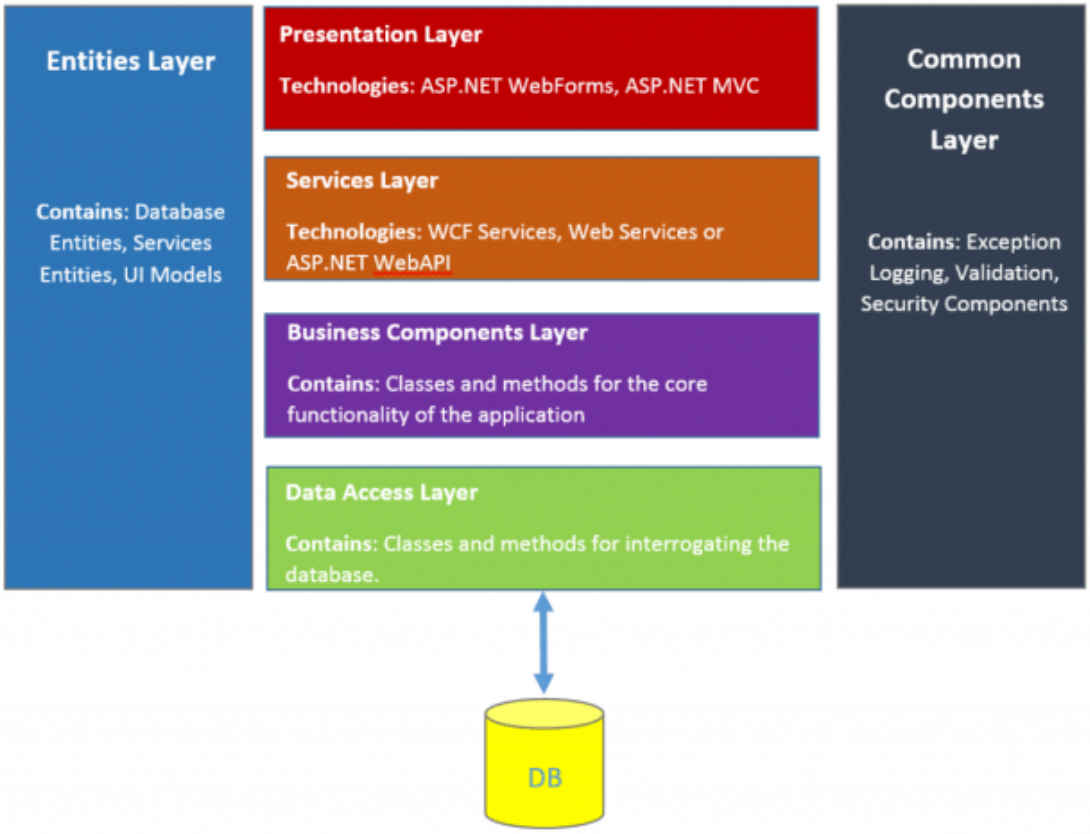


Figure 3.1.: Web N-Layered Architecture (Pic. from dotnetdaily.net)

3.5. Data Modeling Method Diagrams

Object oriented behavioral and structural diagrams are used to explain how the data stores and how it will use in the proposed system.

3.5.1. Object Oriented Behavioral Diagrams

Use Case Diagram

The top level use case diagram for proposed system is showed in following ***Figure 3.2.: Top-Level Use Case Diagram for the Proposed System***. Used to depict the agent management activities such as define and map agent, sales activities such as forecast, budget, and target and commissions management, sales transactions management like price book and invoicing.

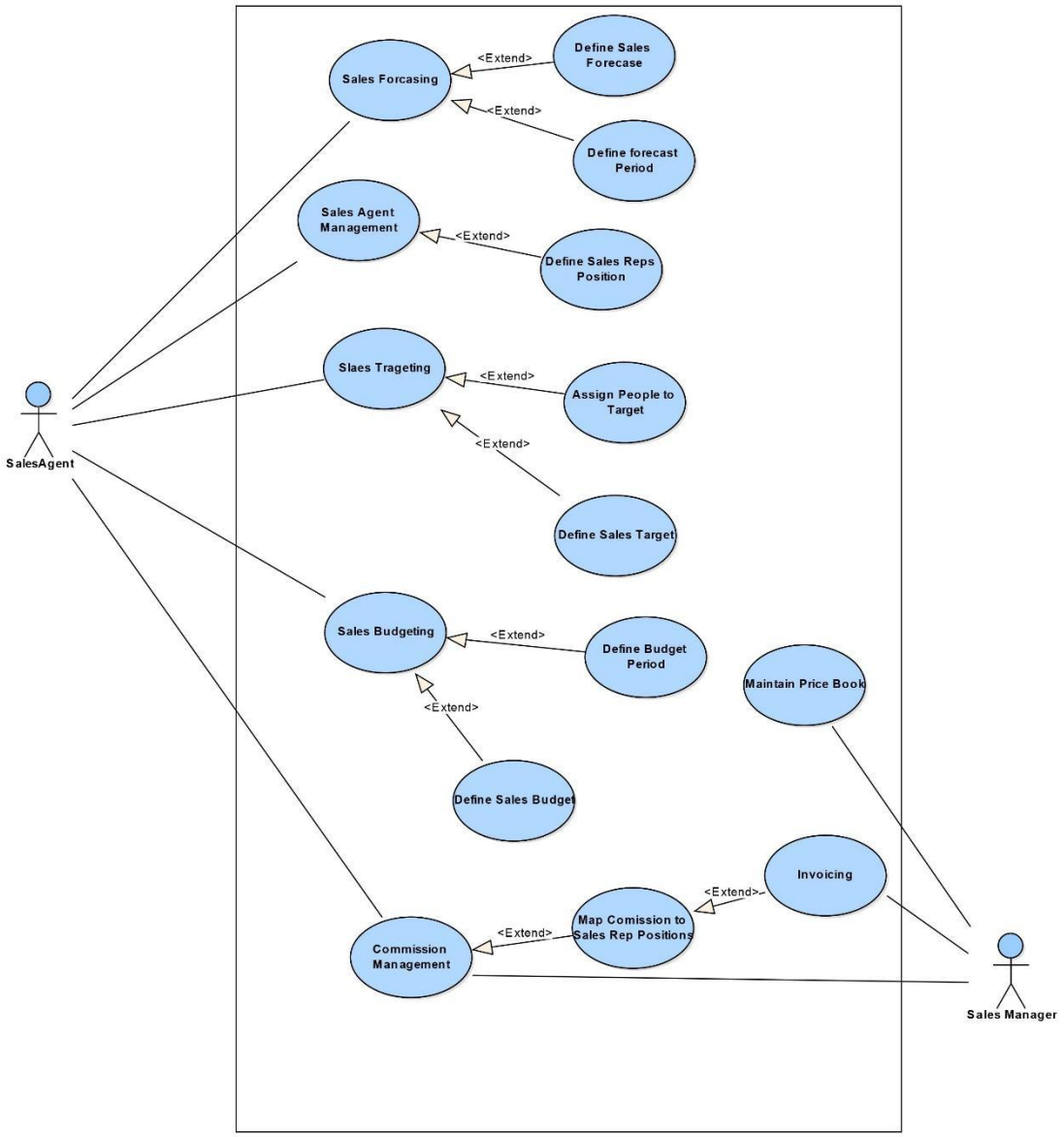


Figure 3.2.: Top-Level Use Case Diagram for the Proposed System

Activity Diagram

Figure 3.3.: Activity Diagram for the Proposed System. Used to explain how the system dynamically manage reference data while executing parallel activities.

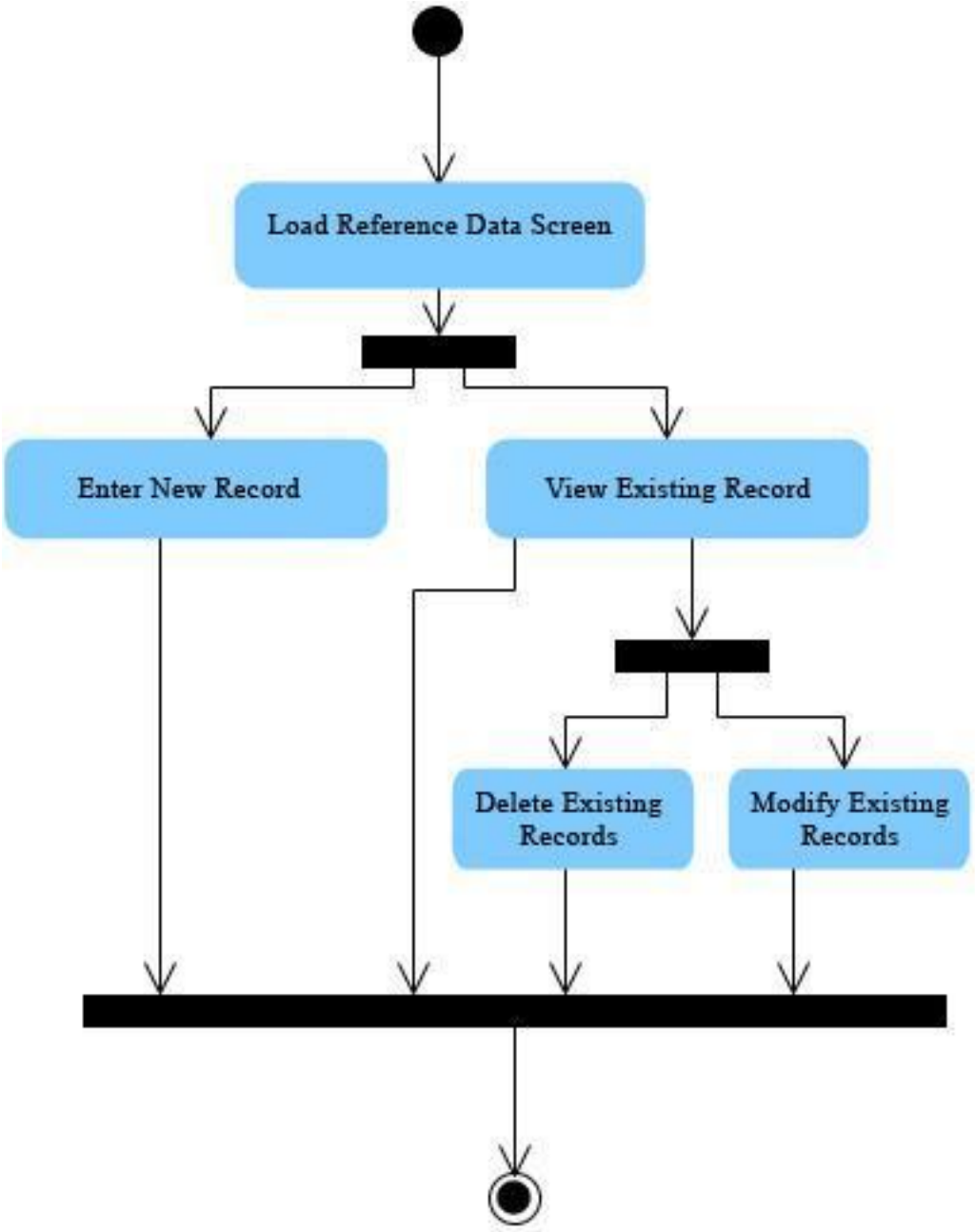


Figure 3.3.: Activity Diagram for the Proposed System

3.5.2. Object Oriented Structural Diagrams

Class Diagram

Figure 3.4.: Class Diagram for the Proposed System is a static structure diagram that shows how the agent management structured with relations of classes.

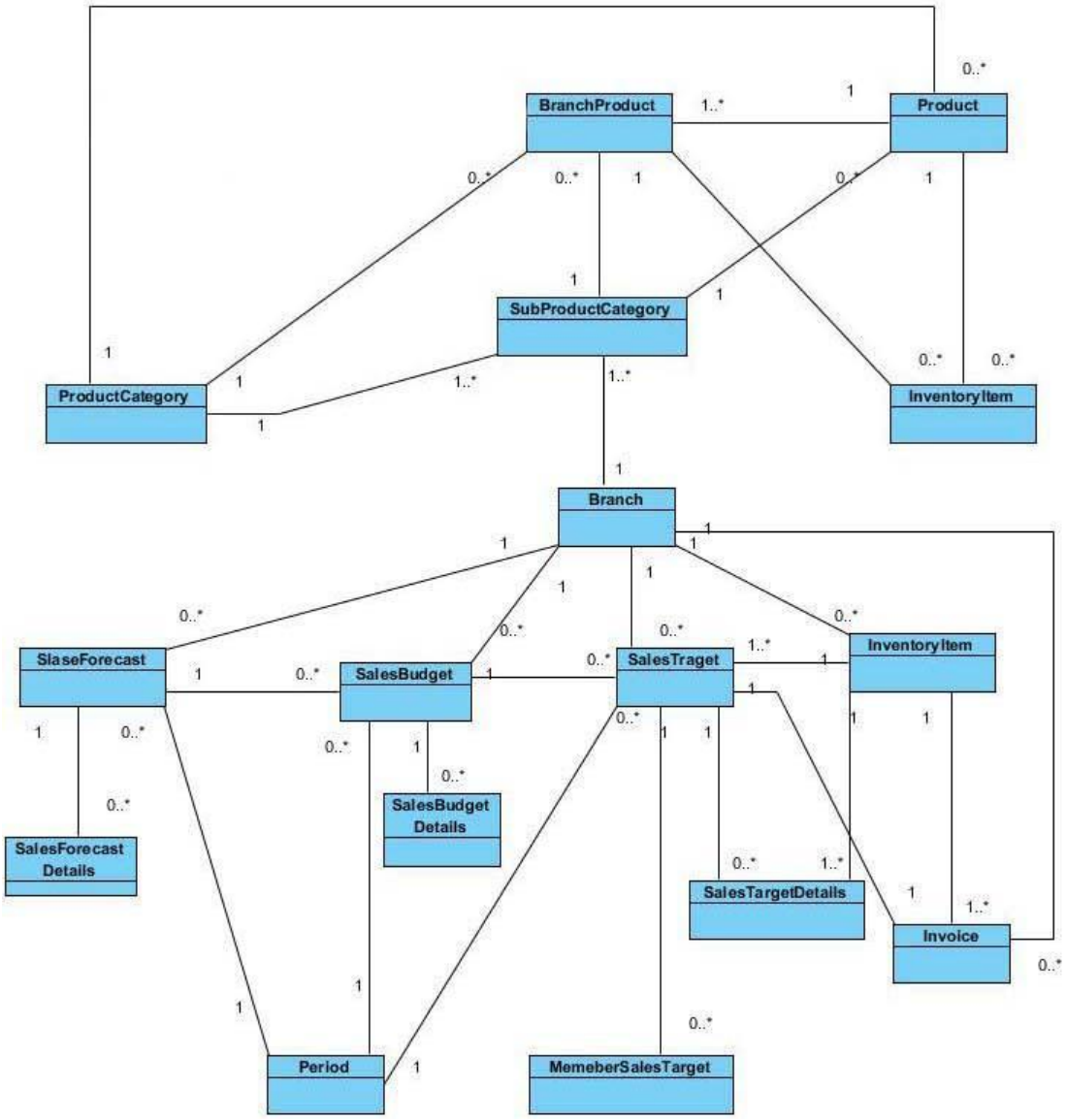


Figure 3.4.: Class Diagram for the Proposed System

Sequence Diagram

Sequence diagram explains how system elements operate one another and order of that. Sequence diagram as ***Figure 3.5: Proposed System - Sequence Diagram*** below.

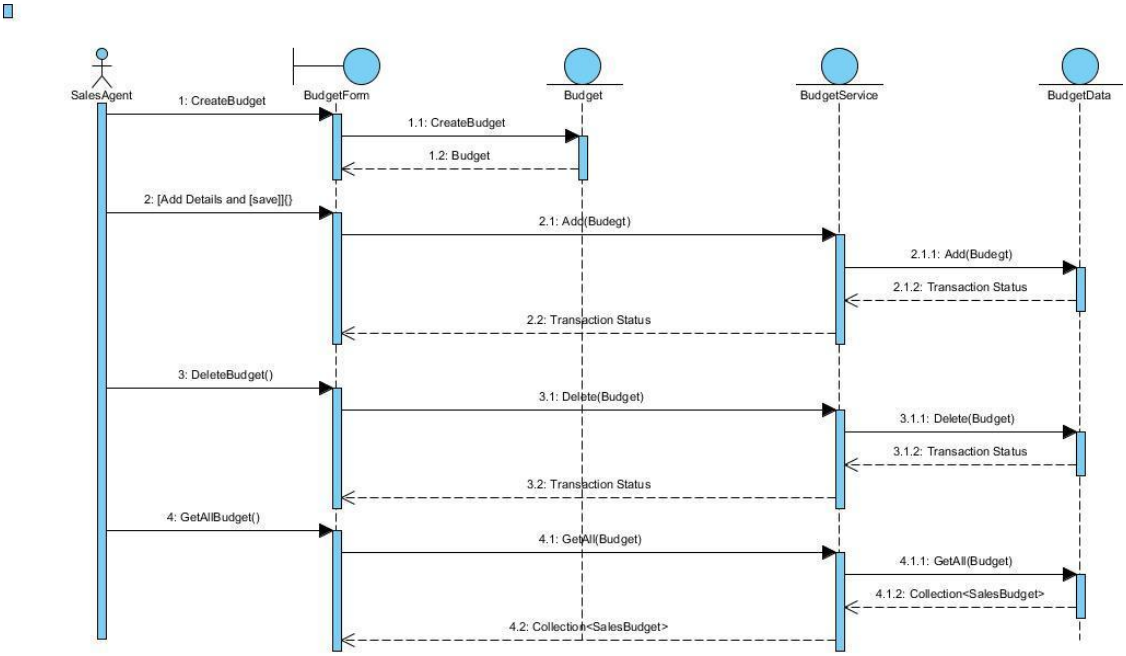


Figure 3.5.: Sequence Diagram for the Proposed System

3.6. User Interface Design

The following ***Figure 3.6.: User Login Window***, ***Figure 3.7.: Sales gents Details Window***, ***Figure 3.8.: Sales Agent Map Window***, ***Figure 3.9.: Sales Summary Report***, ***Figure 3.10.: Sales Invoice Report*** Were GUI that used in 'BizFlexer' Sales Agent System.

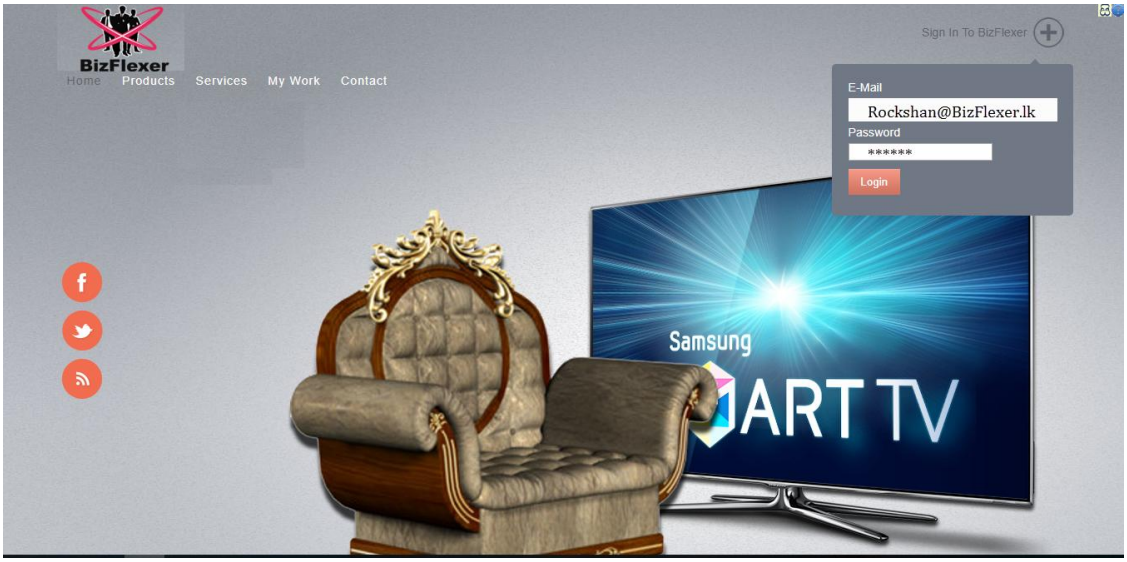


Figure 3.6.: User Login Window

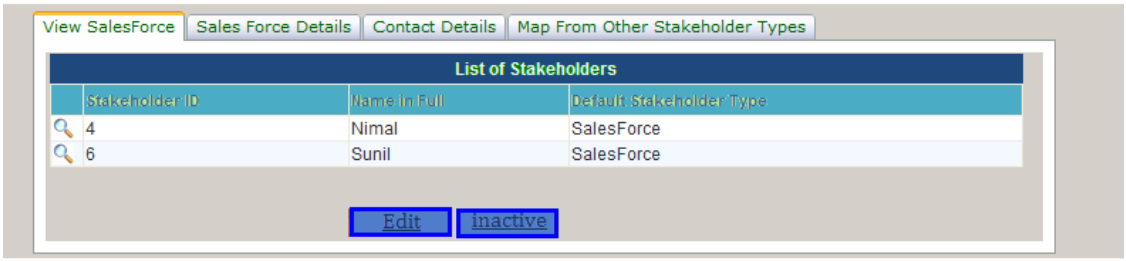


Figure 3.7.: Sales gents Details Window

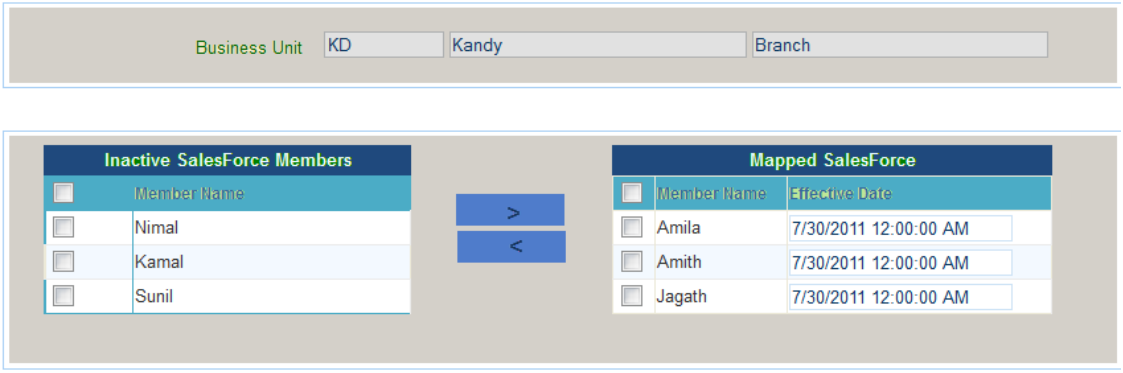


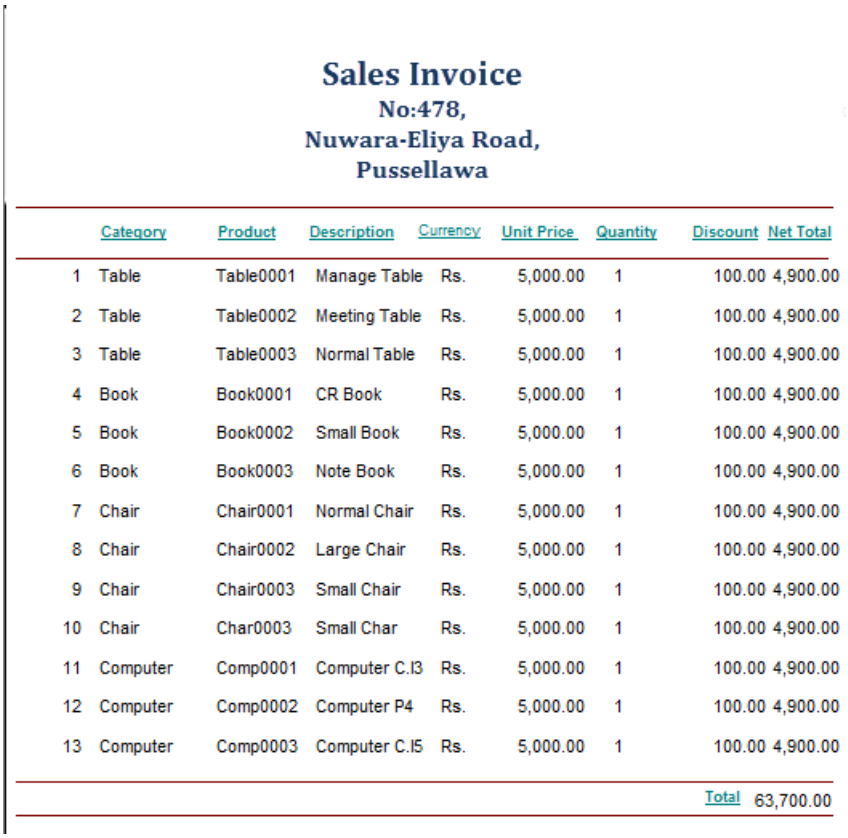
Figure 3.8.: Sales Agent Map Window

Sales Summary

No:478,
Nuwara-Eliya Road,
Pussellawa

Business Unit	Category	Product	Description	Currency	Gross Total	Discount	Net Total	Tax
Colombo	Chair	Chair0001	Normal Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Chair0002	Large Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Chair0003	Small Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Char0003	Small Char	Rs.	5,000.00	100.00	4,900.00	100.00
Gampola	Computer	Comp0001	Computer C.I3	Rs.	5,000.00	100.00	4,900.00	100.00
		Comp0002	Computer P4	Rs.	5,000.00	100.00	4,900.00	100.00
		Comp0003	Computer C.I5	Rs.	5,000.00	100.00	4,900.00	100.00
Kandy	Book	Book0001	CR Book	Rs.	5,000.00	100.00	4,900.00	100.00
		Book0002	Small Book	Rs.	5,000.00	100.00	4,900.00	100.00
		Book0003	Note Book	Rs.	5,000.00	100.00	4,900.00	100.00
	Table	Table0001	Manage Table	Rs.	5,000.00	100.00	4,900.00	100.00
		Table0002	Meeting Table	Rs.	5,000.00	100.00	4,900.00	100.00
		Table0003	Normal Table	Rs.	5,000.00	100.00	4,900.00	100.00
				Total :	65,000.00	1,300.00	63,700.00	1,300.00

Figure 3.9.: Sales Summary Report



Sales Invoice

No:478,
Nuwara-Eliya Road,
Pussellawa

	Category	Product	Description	Currency	Unit Price	Quantity	Discount	Net Total
1	Table	Table0001	Manage Table	Rs.	5,000.00	1	100.00	4,900.00
2	Table	Table0002	Meeting Table	Rs.	5,000.00	1	100.00	4,900.00
3	Table	Table0003	Normal Table	Rs.	5,000.00	1	100.00	4,900.00
4	Book	Book0001	CR Book	Rs.	5,000.00	1	100.00	4,900.00
5	Book	Book0002	Small Book	Rs.	5,000.00	1	100.00	4,900.00
6	Book	Book0003	Note Book	Rs.	5,000.00	1	100.00	4,900.00
7	Chair	Chair0001	Normal Chair	Rs.	5,000.00	1	100.00	4,900.00
8	Chair	Chair0002	Large Chair	Rs.	5,000.00	1	100.00	4,900.00
9	Chair	Chair0003	Small Chair	Rs.	5,000.00	1	100.00	4,900.00
10	Chair	Char0003	Small Char	Rs.	5,000.00	1	100.00	4,900.00
11	Computer	Comp0001	Computer C.I3	Rs.	5,000.00	1	100.00	4,900.00
12	Computer	Comp0002	Computer P4	Rs.	5,000.00	1	100.00	4,900.00
13	Computer	Comp0003	Computer C.I5	Rs.	5,000.00	1	100.00	4,900.00

Total 63,700.00

Figure 3.10.: Sales Invoice Report

3.7. Database Design

The normalized manner of table structure, and well defined relationships help to minimize data redundancy, save storage space and ensure the consistency of the data. The ultimate goal of database design is generate database with optimized performance.

Table Structures

Following *Table 3.1.* To *Table 3.8.* Diagrams were depicted the table structures in the database. Last column was about **E (**empty**) / D (**default value**) / R (**calculated result**)/ A (**auto increment**)**

Table Name SalesAgentPosition

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
Code		nvarchar	8	
Description		nvarchar	50	
DirectCommissionRate		decimal		
IndirectCommissionRate				
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table 3.1.: 'Agents Position' Table Structure

Table Name SalesAgentStructure

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
ParentSalesAgentStructureId		bigint		
SalesForceStructureId		bigint		
BusinessUnitListId		bigint		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table 3.2.: 'Agent' Table Structure

Table Name SalesAgentTeamMembers

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesAgentTeamId		bigint		
SalesForceStructureId		bigint		
StakeholderId		bigint		
ActiveDate		DateTime		
InactiveDate		nvarchar	50	

Table 3.3.: 'Members' Table Structure

Table Name Commission

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesAgentTeamMembersId		bigint		
SalesForceStructureId		bigint		
StakeholderId		bigint		
DirectCommissionTotalSales		Boolean		
DirectCommissionSalesProfit		Boolean		
IndirectCommissionTotalSales				
IndirectCommissionSalesFrofit				
OtherCommission				
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table 3.4.: 'Commissions' Table Structure

Table Name SalesTargetDetails

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesTargetId	FK	bigint		A
BusinessUnitListProductId		bigint		
Quantity		bigint		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table 3.5.: 'Sales Target' Table Structure

Table Name SalesTeamSalesTarget

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesTargetId	FK	bigint		A
SalesForceTeamMembersId	PK	bigint		A
EffectiveDate		DateTime		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table 3.6.: 'Sales Team' Table Structure

Table Name SalesBudget

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
BusinessUnitList Id		bigint		
BudgetPeriodId	PK	bigint		A
SalesForecasttId	PK	bigint		A
EffectiveDate		DateTime		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table 3.7.: 'Budget' Table Structure

Table Name Status

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
StatusId	PK	bigint		A
Code		varchar		
Description		varchar		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table 3.8.: 'Status' Table Structure

Chapter 4: Implementation

4.1. Introduction

Implementation environment, major code and module structures, reusable components and other system dependencies were discussed in chapter 4: Implementation.

4.2. Development Environment

Sales Agent Management System is developed by using **C#** language, which " is an object-oriented programming language used with XML-based Web services on the .NET platform and designed for improving productivity in the development of Web applications" [2]

The following system software, software applications and tools are required in developing 'BizFlexer' Sales Agent Management System:

- Operating system: Microsoft Windows 10[any version]
- Integrated Development Environment: Visual Studio 2015[or 2017]
- Database: Microsoft SQL Server 2008[or any latest versions]
- Web browser: Google Chrome, Firefox, Microsoft edge
- Graphic Designer: Adobe Photoshop
- Project Management: Microsoft Project 2010
- Framework: .NET Framework 4.5
- Word processor: Microsoft Word 2013
- System Modeling: (EA) Enterprise Architect
- Reporting: Crystal Report
- Infrastructure: Ajax control Toolkit
- Version Control: Tortoise SVN
- Text Editor: Notepad++

- **Microsoft Visual Studio**

"Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs for Microsoft Windows, as well as web sites, web apps, web services and mobile apps. Visual Studio uses Microsoft software development platforms such as Windows API, Windows Forms, Windows Presentation Foundation, Windows Store and Microsoft Silverlight. It can produce both native code and managed code.

Visual Studio includes a code editor supporting IntelliSense (the code completion component) as well as code refactoring. The integrated debugger works both as a source-level debugger and a machine-level debugger. Other built-in tools include a code profiler, forms designer for building GUI applications, web designer, class designer, and database schema designer. It accepts plug-ins that enhance the functionality at almost every level—including adding support for source control systems (like Subversion) and adding new toolsets like editors and visual designers for domain-specific languages or toolsets for other aspects of the software development lifecycle (like the Team Foundation Server client: Team Explorer).

Visual Studio supports 36 different programming languages and allows the code editor and debugger to support (to varying degrees) nearly any programming language, provided a language-specific service exists. Built-in languages include C,[6] C++ and C++/CLI (via Visual C++), VB.NET (via Visual Basic .NET), C# (via Visual C#), F# (as of Visual Studio 2010[7]) and Typescript (as of Visual Studio 2013 Update 2). Support for other languages such as Python, Ruby, Node.js, and M among others is available via language services installed separately. It also supports XML/XSLT, HTML/XHTML, JavaScript and CSS. Java (and J#) were supported in the past.

Microsoft provides a free version of Visual Studio called the Community edition that supports plugins and is available at no cost." [3]

Control Panel of Microsoft Visual Studio shows in the following ***Figure 4.1: Microsoft Visual Studio Control Panel.***

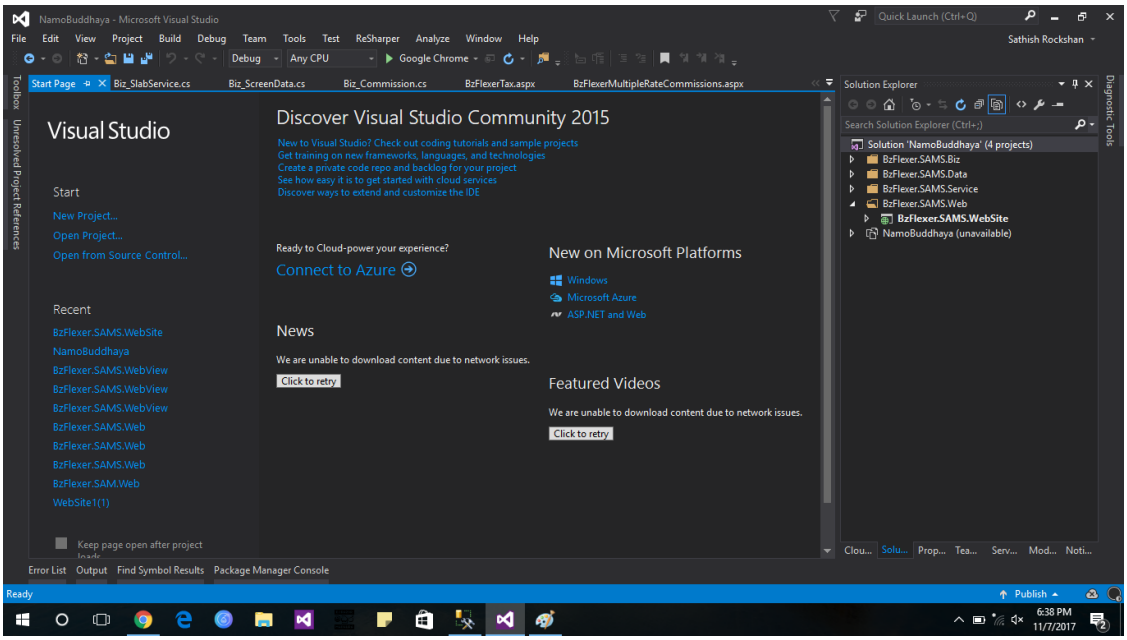


Figure 4.1.: Microsoft Visual Studio Control Panel

- **.NET framework**

".NET Framework is a software framework developed by Microsoft that runs primarily on Microsoft Windows. It includes a large class library named Framework Class Library and provides language interoperability across several programming languages."

"A programming infrastructure created by Microsoft for building, deploying, and running applications and services that use .NET technologies, such as desktop applications and Web services.

The .NET Framework contains three major parts:

- the Common Language Runtime
- the Framework Class Library
- ASP.NET." [4]

- **Entity framework**

"Entity Framework is an object-relational mapper (O/RM) that enables .NET developers to work with a database using .NET objects. It eliminates the need for most of the data-access code that developers usually need to write." [5]

4.3. Implementation Environment

For a smooth performance following hardware requirements and software requirements were prefer to ‘BizFlexer’ Sales Agent Management System.

4.3.1. Hardware Requirements

Minimum hardware specification are required to execute ‘BizFlexer’ Sales Agent Management System as follows.

- Processor - Intel Pentium IV 2.8GHz or higher.
- RAM - 2GB or higher memory capacity.
- Hard Disk - 25GB or higher capacity.
- Monitor - SVGA with minimum 1024x768 or higher resolution.
- 104 Key Monitor
- Mouse
- Internet Connection

4.3.2. Software Requirements

‘BizFlexer’ execute as a web site through web browsers such as:

- Microsoft Edge.
- Firefox.
- Google Chrome.

  And Crystal Report Runtime need view reports in client machine.

4.4. Configuration Management

4.4.1. Installing Internet Information Service (IIS)

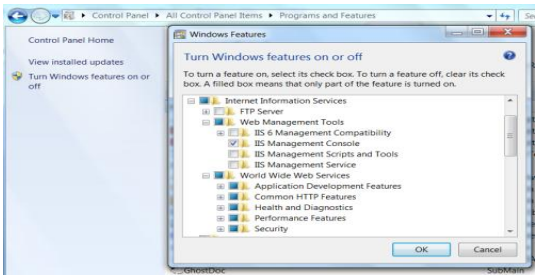


Figure 4.2.: IIS (Internet Information Service) Window.

Click the Start button and then select settings menu option. Then click on the Control Panel menu. Click on the Add/Remove programs icon. After that click on the Add/Remove Windows Components icon on the left of the screen. Make sure that the following entries are checked in screen that similar to Figure 4.2.

- Internet Information Services
- World Wide Web Service

Click on the OK button to follow the prompts from Windows during the IIS installation.

4.4.2. Installing Visual Studio

Figure 4.3.: Visual Studio Setup Screen.

Double click on that Visual Studio exe file on Install Microsoft Visual Studio link to continue Visual Studio installation. After setup is completed loading of installation components, click on NEXT button.

Figure 4.4.: License Agreement Screen.

Mark the checkbox indicating that you have read and accepted the license terms. Then Next button is activated, click on Next button to continue Microsoft Visual Studio installations.

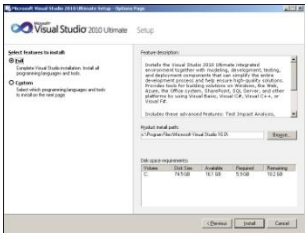


Figure 4.5.: Options Screen

Click on the Finish button to complete the installations.

4.5. Major Project Structures

Entity Framework 5.0 was the object- relational mapper this enabled working with relational data using domain-specific objects in .NET Framework 4.5.2 programming framework to manipulate these features C# 5.0 used as the programming. BizFlexer developed according to web N-Layer architecture which usually contains Presentation Layer, Business Logic Layer and Data Access Layer .Internet Information Server and its own process engine optimized the BizFlexer hosting.

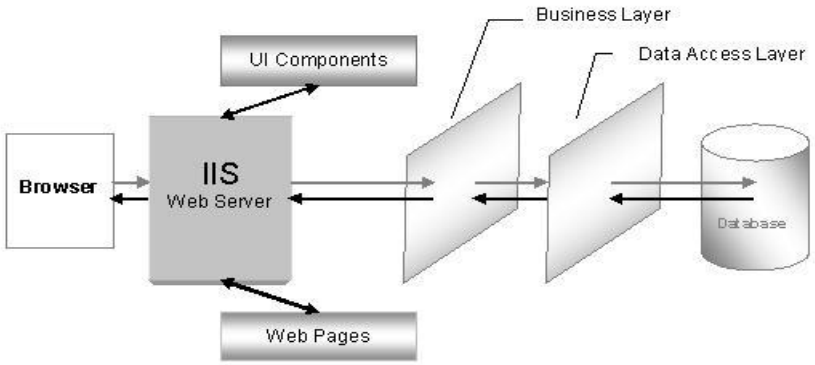


Figure 4.6.: Interaction between modules of system (Pic. from Wikipedia)

4.5.1 Module Structure

Figure 4.3.: Module Structure depict the system module structure using solution explorer in IDE.

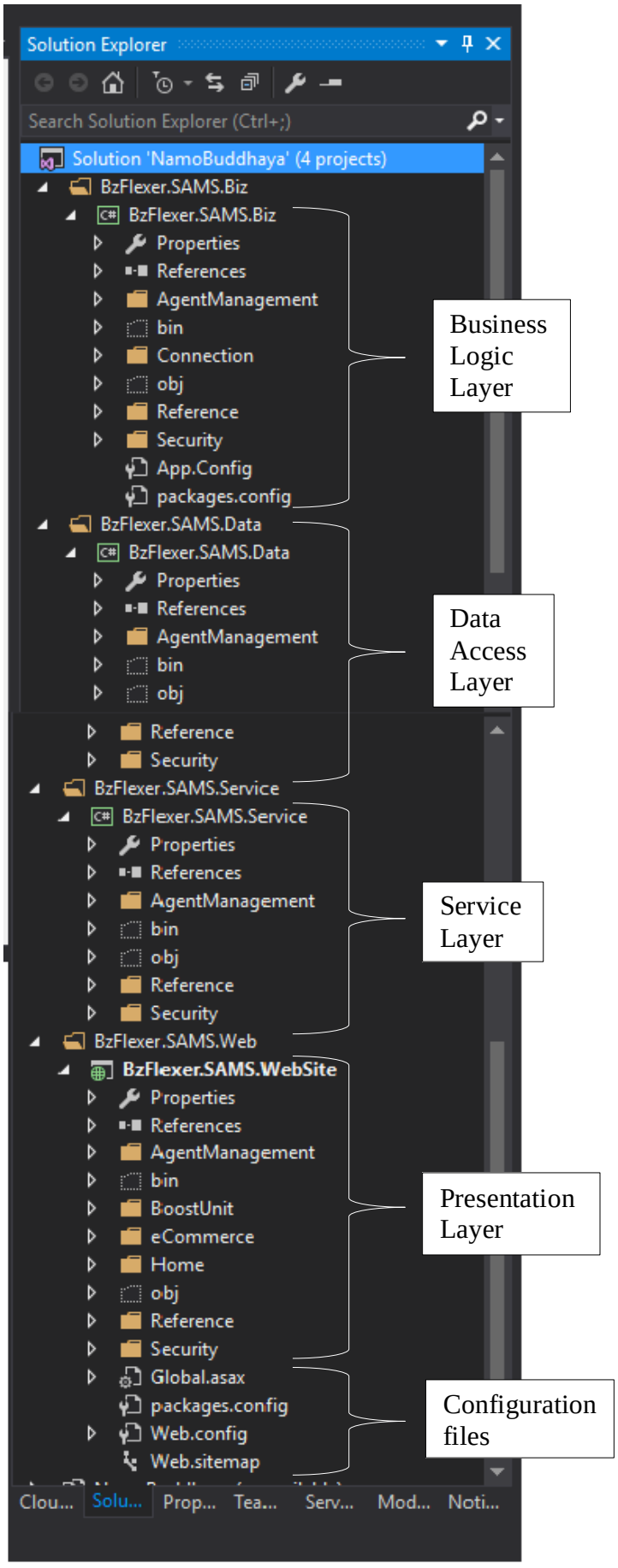


Figure 4.7.: Module Structure

4.5.2 Code Structure

According to Figure 4.3.: Module Structure 'BizFlexer 'contained modules which were structured with different code structures. Following section is about major code structures that used in 'BizFlexer '.

Presentation Layer

Presentation layer is the space where interactions between humans and machines occur. According to 'BizFlexer' presentation layer is mainly constructed with web forms with .aspx extension and web forms were very useful to information transaction among user and system.

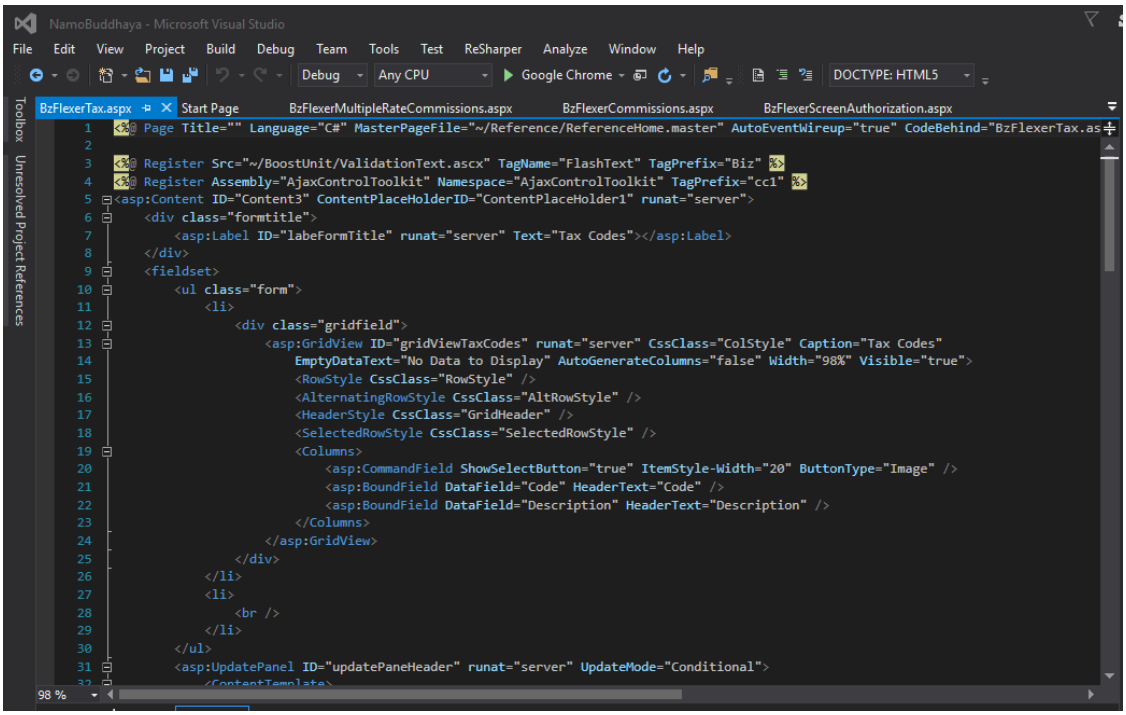


Figure 4.8.: Presentation Layer

Business Logic Layer

Business Logic Layer contained with domain classes, validations related to the data and established connection to database with connection string variable.

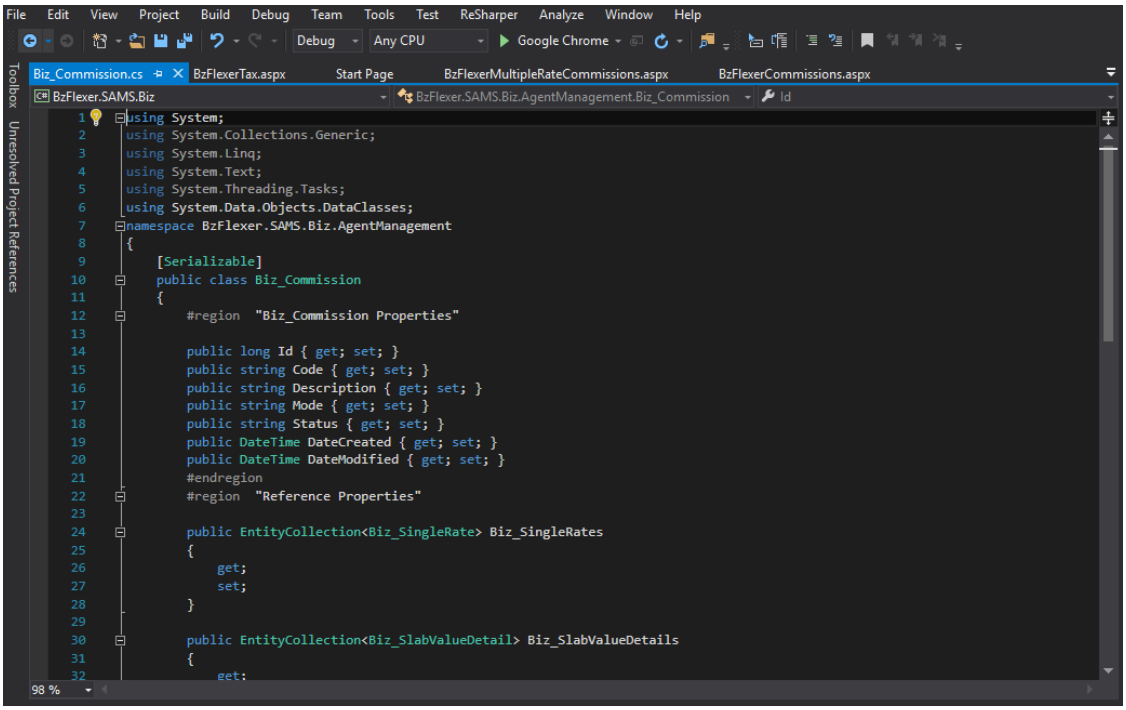


Figure 4.9.: Business logic Layer

Data Access Layer

Specialized select, insert, update and delete methods were written here to interact with database and perform certain business transactions.

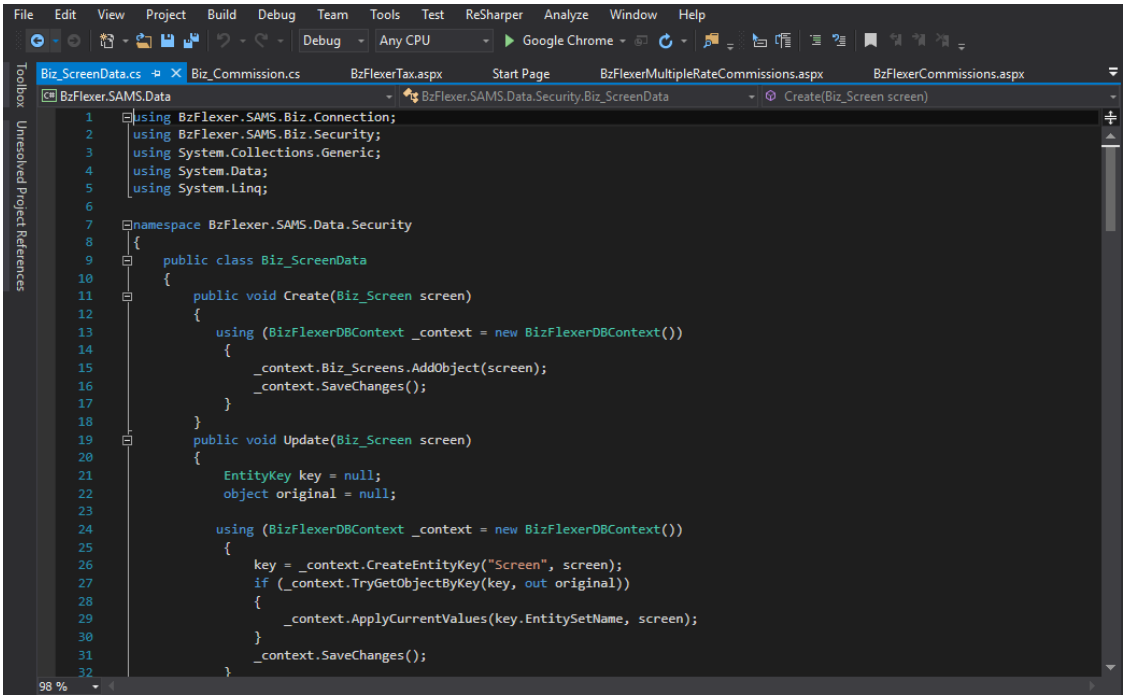


Figure 4.10.: Data Access Layer

Service Layer

Service layer provide distributed data manipulation objects to optimize the code reusability.

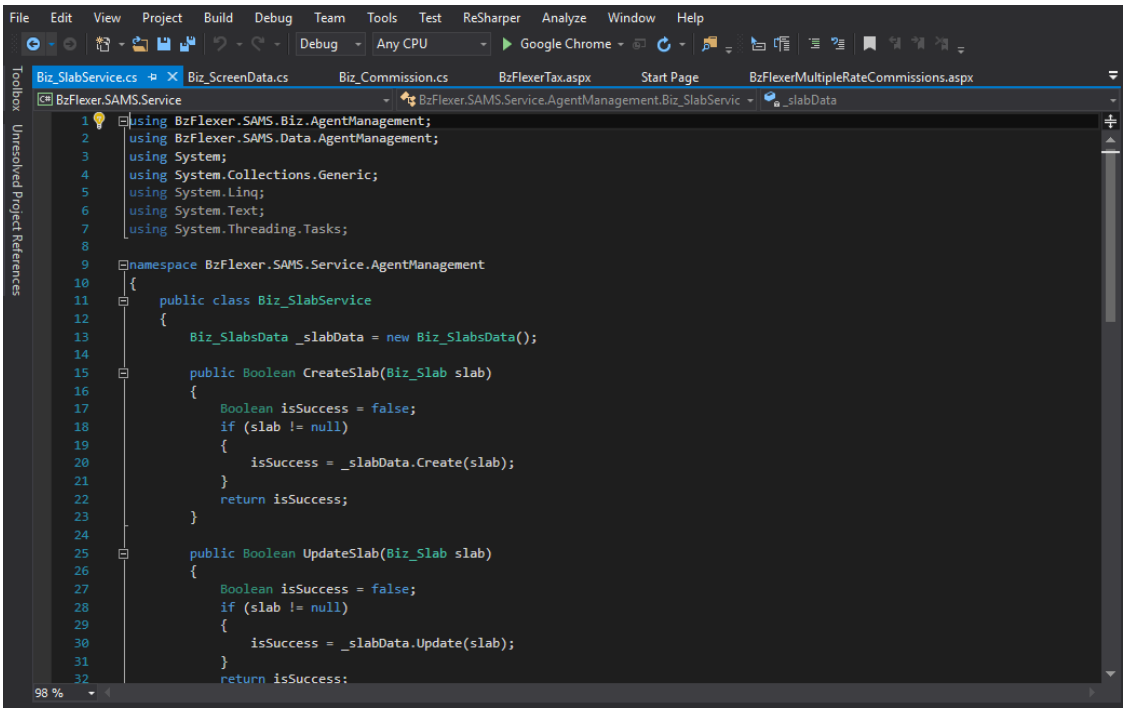


Figure 4.11.: Service Layer

4.6. External Libraries

‘BizFlexer’ Sales Agent Management System Developed using following external libraries to boost up the automating performance.

- Bootstrap.
- Ajax Control Tool Kit.

4.7. Reused Components

- Header and Footer of all webpages that visible after login.

ASP.NET master page feature was used as reusable component to accomplish this requirement.

- Side Navigations in every sub modules.

Side Navigations that locates in every sub modules were reused but bonded sources were depended with situation. Side Navigation of every panel of User console.

- Flash message components.

To notify users interaction with the ‘BizFlexer’ Sales Agent Management System common flash message class was reused.

- Current Location Map.

This feature enabled current user location using web site path. With user navigation it will change its parameters and show current location of the user.

Chapter 5: Evaluation

5.1. Introduction

Chapter 5: Evaluation about how the proper test done for 'BizFlexer' Sales Agent Management System. From the inception phase evaluation is continued until end of transition phase. Validations and Verifications of 'BizFlexer' Sales Agent Management evolutionary prototype was helped to build a customer satisfied solution. By developing right system not only that but also system right caused to 'BizFlexer' a well-qualified sales agent management tool.

5.2. Test Plan

Test plan is dynamic because it works with an executable evolutionary prototype of the system. Test data allow to check that system is performing as expected results.

Following ***Figure 5.2.: System Testing levels*** depict the phases that completed to achieve a fully tested solution.

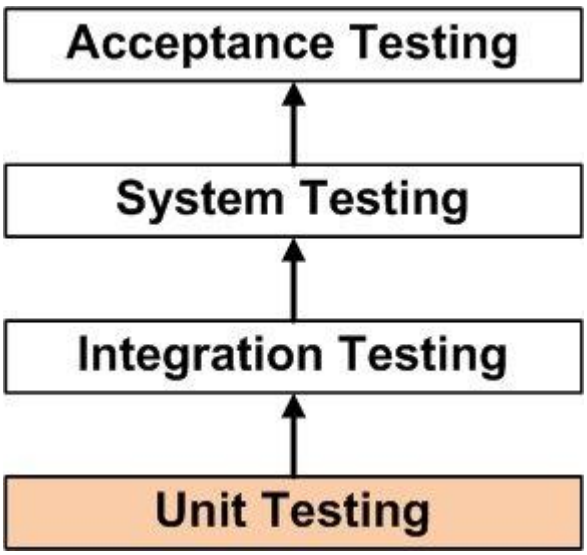


Figure 5.1.: System testing levels

The following ***Figure 5.1.: Testing Levels in The Project Lifecycle*** depicts how the testing procedures flow through the SDLC.

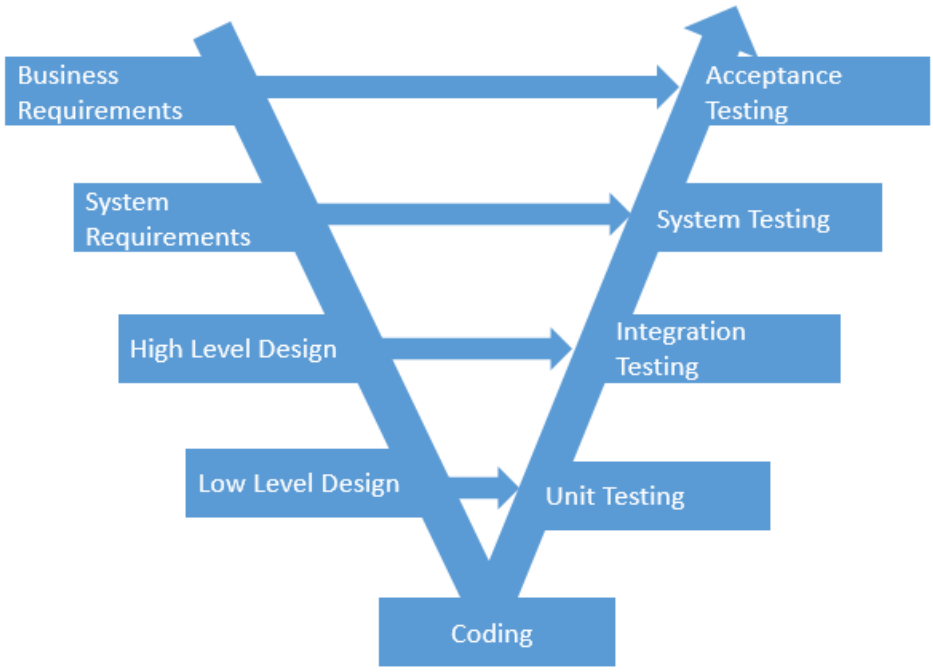


Figure 5.2.: Testing Levels in the Project Lifecycle [12]

5.2.1. Testing Objectives

There were main two objectives in this test plan:

- 'BizFlexer' Agent Management System able to facilitate an error free environment for its users.
- Verifies the level of achievement in requirement specification domain for 'BizFlexer' Agent Management System.

5.2.2. Testing Scope

"The overall purpose of testing is to ensure the application meets all of its technical, functional and business requirements. The purpose of this document is to describe the Overall test plan and strategy for testing the application. The approach described in this document provides the framework for all testing related to this application. Individual test cases will be written for each version of the application that is released. This document will also be updated as required for each release." [6]

Final version of the 'BizFlexer' Sales Agent Management System described in following section.

5.3. Test Cases with Test Results

"A test case is a set of conditions or variables under which a tester will determine whether a system under test satisfies requirements or works correctly.

The process of developing test cases can also help find problems in the requirements or design of an application." [7]

5.3.1. Unit Testing

"**Unit testing** is a software development process in which the smallest testable parts of an application, called units, are individually and independently scrutinized for proper operation." [8]

ID	Test Case	Expected Output	Actual Output	Status
01	Welcome Page	Load Welcome Page with relevant components	Load Welcome Page with relevant components	Pass
02	Login Modal	Load Login Modal with relevant components	Load Login Modal with relevant components	Pass
03	Home Page	Load Home Page with enabled module navigation components	Load Home Page with enabled module navigation components	Pass
04	Navigation Panel	Load user relevant menu	Load user relevant menu	Pass
05	Branch selector	Load relevant items	Load relevant items	Pass
06	Site Map	Show current location	Show current location	Pass
07	User status	Show current user name	Show current user name	Pass
08	Reference Data - Branch Definition	Load Branch Definitions	Load Branch Definitions	Pass

09	Branch Definition- Add Branch Definition	Load Add Branch Definitions	Load Add Branch Definitions	Pass
10	Branch Definition- Modify Branch Definition	Load Modify Branch Definitions	Load Modify Branch Definitions	Pass
11	Reference Data - Unit of measure types	Load Unit of measure types	Load Unit of measure types	Pass
12	Branch Definition- Add Unit of measure types	Load Add Unit of measure types	Load Add Unit of measure types	Pass
13	Branch Definition- Modify Unit of measure types	Load Modify Unit of measure types	Load Modify Unit of measure types	Pass
14	Reference Data - Unit of measure	Load Unit of measure	Load Unit of measure	Pass
15	Branch Definition- Add Unit of measure	Load Add Unit of measure	Load Add Unit of measure	Pass
16	Branch Definition- Modify Unit of measure	Load Modify Unit of measure	Load Modify Unit of measure	Pass

17	Reference Data - Currency	Load Currency data	Load Currency data	Pass
18	Reference Data - Currency	Load Add Currency data	Load Add Currency data	Pass
19	Reference Data - Currency	Load Modify Currency data	Load Modify Currency data	Pass
20	Stakeholder Management – Stakeholder Types	Load Stakeholder Types	Load Stakeholder Types	Pass
21	Stakeholder Management – Stakeholder Types	Load Add Stakeholder Types data	Load Add Stakeholder Types data	Pass
22	Stakeholder Management – Stakeholder Types	Load Modify Stakeholder Types data	Load Modify Stakeholder Types data	Pass
22	Stakeholder Management –Stakeholder Details	Load Stakeholder Details	Load Stakeholder Details	Pass

23	Stakeholder Management –Stakeholder Details	Load Add Stakeholder Details	Load Add Stakeholder Details	Pass
24	Stakeholder Management –Stakeholder Details	Load Modify Stakeholder Details	Load Modify Stakeholder Details	Pass
25	Stakeholder Management –Stakeholder Map	Load Stakeholder Map	Load Stakeholder Map	Pass
26	Stakeholder Management –Stakeholder Map	Load Add Stakeholder Map	Load Add Stakeholder Map	Pass
27	Stakeholder Management –Stakeholder Map	Load Modify Stakeholder Map	Load Modify Stakeholder Map	Pass

Table 5.1.: GUI Unit Test Cases

5.3.2. Integration Testing

"**Integration testing**, also known as **integration** and **testing** (I&T), is a software development process which program units are combined and **tested** as groups in multiple ways." [9]

ID	Test Case	Expected Output	Actual Output	Status
01	Login – with valid credentials	Successfully login to the 'BizFlexer' system	Successfully login to the 'BizFlexer' system	Pass
02	Login – with Invalid credentials	Login failed notification for invalid data	Login failed notification for invalid data	Pass
03	Home Page click REFERENCE Navigation	Load Reference main page	Load Reference main page	Pass
04	Home Page click SALES AGENT MANGEMENT Navigation	Load SALES AGENT MANGEMENT main page	Load SALES AGENT MANGEMENT main page	Pass
05	Home Page click REPORT CENTER Navigation	Load REPORT CENTER main page	Load REPORT CENTER main page	Pass
06	Home Page click SECURITY Navigation	Load SECURITY main page	Load SECURITY main page	Pass
07	Session Out	Redirect to welcome page	Redirect to welcome page	Pass
08	Reference Data - Branch Definition	Data grid loads current Branch Definitions	Load Branch Definitions	Pass
09	Branch Definition - Click Add	Notification for mandatory fields	Notification for mandatory fields	Pass
10	Branch Definition-Click Add with valid data	Notification for Successfully saved	Notification for Successfully saved	Pass
11	Branch Definition- Click Modify	Notification for Successfully Modified	Notification for Successfully Modified	Pass

12	Reference Data - Unit of measure types	Data grid loads current Unit of measure types	Load Unit of measure types	Pass
13	Unit of measure types - Click Add	Notification for mandatory fields	Notification for mandatory fields	Pass
14	Unit of measure types -Click Add with valid data	Notification for Successfully saved	Notification for Successfully saved	Pass
15	Unit of measure types -Click Modify	Notification for Successfully Modified	Notification for Successfully Modified	Pass
16	Reference Data - Unit of measure	Data grid loads current Unit of measure	Load Unit of measure	Pass
17	Unit of measure - Click Add	Notification for mandatory fields	Notification for mandatory fields	Pass
18	Unit of measure -Click Add with valid data	Notification for Successfully saved	Notification for Successfully saved	Pass
19	Unit of measure -Click Modify	Notification for Successfully Modified	Notification for Successfully Modified	Pass
20	Reference Data - Currency	Data grid loads current Load Currency data	Load Currency data	Pass
21	Currency – Click Add	Notification for mandatory fields	Notification for mandatory fields	Pass
22	Currency -Click Add with valid data	Notification for Successfully saved	Notification for Successfully saved	Pass
23	Currency - Click Modify	Notification for Successfully Modified	Notification for Successfully Modified	Pass

24	Stakeholder Management – Stakeholder Types	Data grid loads current Load Stakeholder Types	Load Stakeholder Types	Pass
25	Stakeholder Management Types – Click Add	Notification for mandatory fields	Notification for mandatory fields	Pass
26	Stakeholder Management Types -Click Add with valid data	Notification for Successfully saved	Notification for Successfully saved	Pass
27	Stakeholder Management Types – Click Modify	Notification for Successfully Modified	Notification for Successfully Modified	Pass
28	Stakeholder Management – Stakeholder Details	Data grid loads current Load Stakeholder Details	Load Stakeholder Details	Pass
29	Stakeholder Details – Click Add	Notification for mandatory fields	Notification for mandatory fields	Pass
30	Stakeholder Details -Click Add with valid data	Notification for Successfully saved	Notification for Successfully saved	Pass
31	Stakeholder Details – Click Modify	Notification for Successfully Modified	Notification for Successfully Modified	Pass

32	Stakeholder Management – Stakeholder Map	Data grid loads current Load Stakeholder Map	Load Stakeholder Map	Pass
33	Stakeholder Map – Click Add	Notification for mandatory fields	Notification for mandatory fields	Pass
34	Stakeholder Map -Click Add with valid data	Notification for Successfully saved	Notification for Successfully saved	Pass
35	Stakeholder Map – Click Modify	Notification for Successfully Modified	Notification for Successfully Modified	Pass
36	Log out	Login out from the system	Login out from the system	Pass

Table 5.2.: Integrations Test Cases

5.3.3. System Testing

"**System Testing** is a level of the software **testing** where a complete and integrated software is tested. The purpose of this **test** is to evaluate the **system's** compliance with the specified requirements." [10]

ID	Test Case	Expected Output	Actual Output	Status
1	Define Security Groups	Successfully define groups with required access	Successfully define groups with required access	Pass
2	Assign Authorization (groups)	Successfully adding users to pre-defined security groups	Successfully adding users to pre-defined security groups	Pass

3	Authenticat e screens	Successfully assigned screen permission.	Successfully assigned screen permission.	Pass
4	Create stake holders	Successfully Create stake holder with specified functions	Successfully Create stake holder with specified functions	Pass
5	Map Sales agents to particular branches	Successfully mapped sales agents to perform tasks	Successfully mapped sales agents to perform tasks	Pass
6	Sales budgeting-according to quantity	Sales items budgeted according to quantity	Sales items budgeted according to quantity	Pass
7	Sales budgeting-according to value	Sales items budgeted according to value	Sales items budgeted according to value	Pass
8	Controlling Sales Targets	Sales details successfully added to the sales target which assign to a sales agent and commissions according to that	Sales details successfully added to the sales target which assign to a sales agent	Pass
9	Sales Commission –Calculate for single rate	Commission calculated for a one fixed value	Commission calculated for a one fixed value	Pass
10	Sales Commission –Calculate for multi rate	Commission calculated for slabs	Commission calculated for slabs	Pass

Table 5.3.: System Test Cases

5.3.4. User Acceptance Testing (**UAT**)

"User acceptance testing (**UAT**) is the last phase of the software testing process. During UAT, actual software users test the software to make sure it can handle required tasks in real-world scenarios, according to specifications." [11]

System testing parameters were retested under UAT.

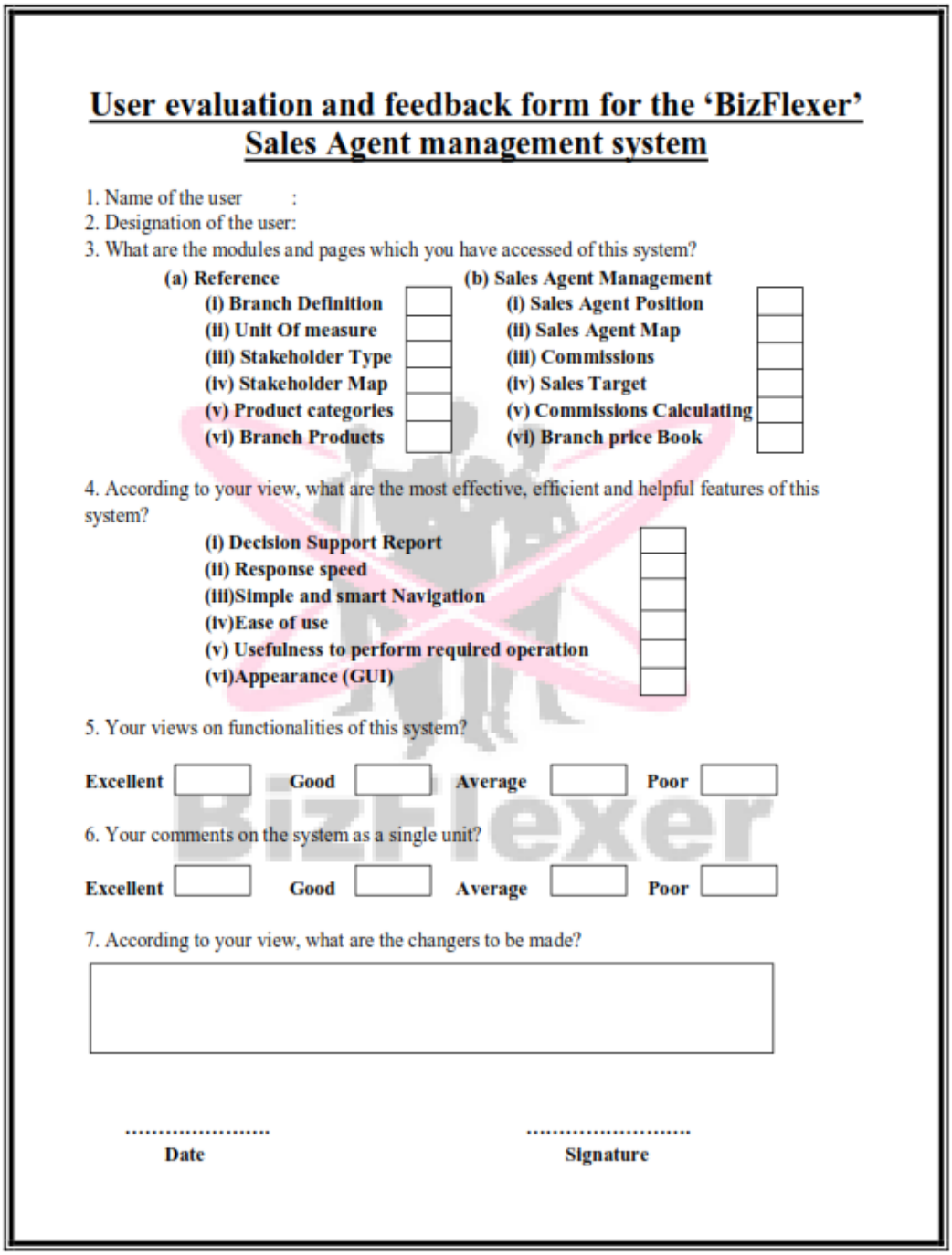
ID	Test Case	Expected Output	Actual Output	Status
1	Define Security Groups	Successfully define groups with required access	Successfully define groups with required access	Pass
2	Assign Authorizations for defined groups	Successfully adding users to pre-defined security groups	Successfully adding users to pre-defined security groups	Pass
3	Authenticate screens	Successfully assigned screen permission.	Successfully assigned screen permission.	Pass
4	Create stake holders	Successfully Create stake holder with specified functions	Successfully Create stake holder with specified functions	Pass
5	Map Sales agents to particular branches	Successfully mapped sales agents to perform tasks	Successfully mapped sales agents to perform tasks	Pass
6	Sales budgeting-according to quantity	Sales items budgeted according to quantity	Sales items budgeted according to quantity	Pass
7	Sales budgeting-according to value	Sales items budgeted according to value	Sales items budgeted according to value	Pass

8	Controlling Sales Targets	Sales details successfully added to the sales target which assign to a sales agent and commissions according to that	Sales details successfully added to the sales target which assign to a sales agent	Pass
9	Sales Commission – Calculate for single rate	Commission calculated for a one fixed value	Commission calculated for a one fixed value	Pass
10	Sales Commission – Calculate for multi rate	Commission calculated for slabs	Commission calculated for slabs	Pass

Table 5.4.: UAT Test Cases

5.4. User Evaluation

The ***Figure D.1.: UAF Document of Managing Director***, ***Figure D.2.: UAF Document of Operator*** and ***Figure D.3.: UAF Document of a Customer*** is a sample that used to acquire system evaluation and feedback



User evaluation and feedback form for the 'BizFlexer' Sales Agent management system

1. Name of the user :
2. Designation of the user:
3. What are the modules and pages which you have accessed of this system?

(a) Reference

- **(i) Branch Definition** ☐
- **(ii) Unit Of measure** ☐
- **(iii) Stakeholder Type** ☐
- **(iv) Stakeholder Map** ☐
- **(v) Product categories** ☐
- **(vi) Branch Products** ☐

(b) Sales Agent Management

- **(i) Sales Agent Position** ☐
- **(ii) Sales Agent Map** ☐
- **(iii) Commissions** ☐
- **(iv) Sales Target** ☐
- **(v) Commissions Calculating** ☐
- **(vi) Branch price Book** ☐

4. According to your view, what are the most effective, efficient and helpful features of this system?

- **(i) Decision Support Report** ☐
- **(ii) Response speed** ☐
- **(iii)Simple and smart Navigation** ☐
- **(iv)Ease of use** ☐
- **(v) Usefulness to perform required operation** ☐
- **(vi)Appearance (GUI)** ☐

5. Your views on functionalities of this system?

Excellent ☐ **Good** ☐ **Average** ☐ **Poor** ☐

6. Your comments on the system as a single unit?

Excellent ☐ **Good** ☐ **Average** ☐ **Poor** ☐

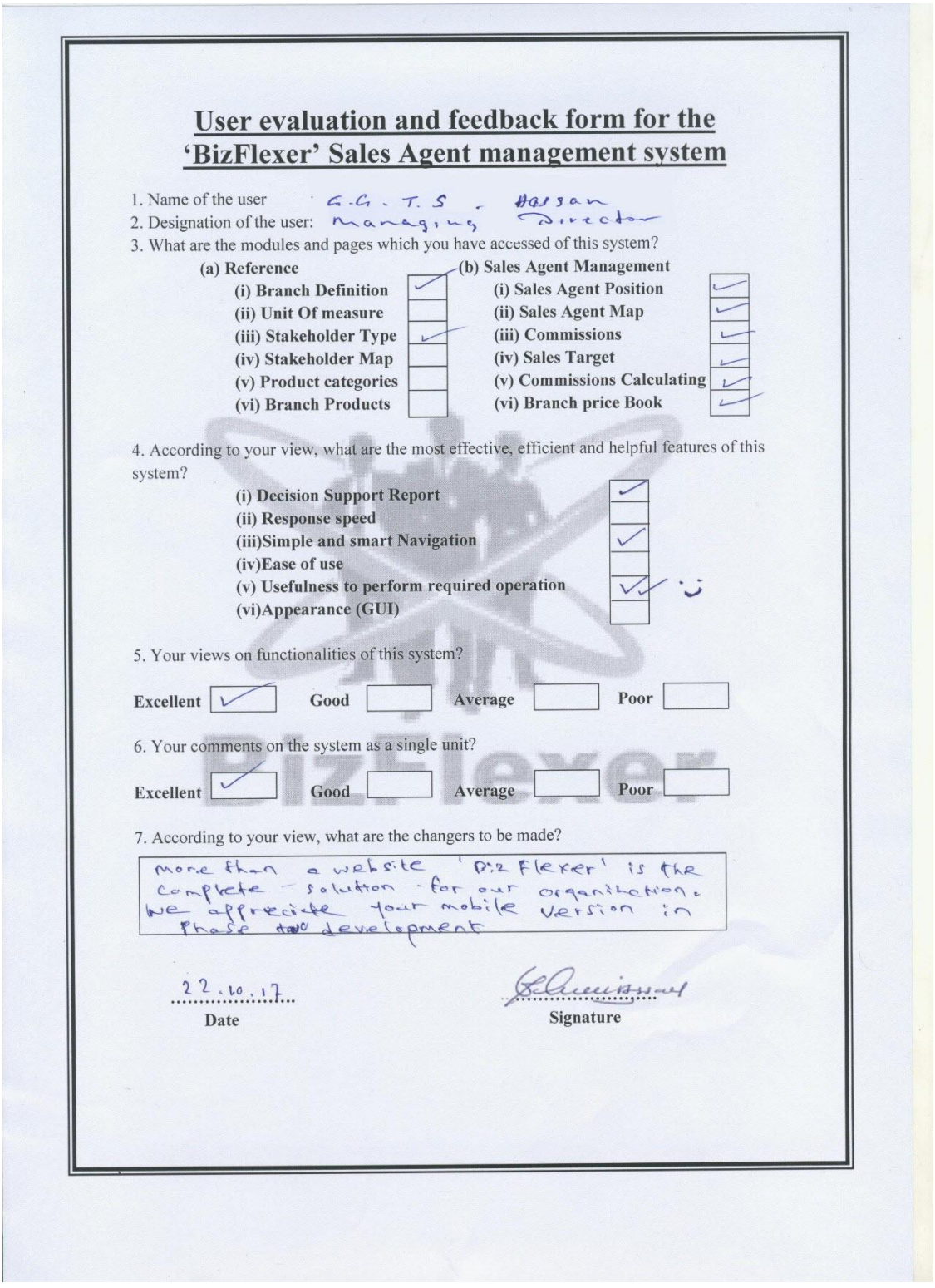
7. According to your view, what are the changers to be made?

☐

..... **Date**

..... **Signature**

Figure 5.3.: Sample user evaluation and Feedback Form



User evaluation and feedback form for the 'BizFlexer' Sales Agent management system

1. Name of the user G.G.T.S. Hassan
2. Designation of the user: Managing Director
3. What are the modules and pages which you have accessed of this system?

(a) Reference		(b) Sales Agent Management	
(i) Branch Definition	✓	(i) Sales Agent Position	✓
(ii) Unit Of measure		(ii) Sales Agent Map	✓
(iii) Stakeholder Type	✓	(iii) Commissions	✓
(iv) Stakeholder Map		(iv) Sales Target	✓
(v) Product categories		(v) Commissions Calculating	✓
(vi) Branch Products		(vi) Branch price Book	✓

4. According to your view, what are the most effective, efficient and helpful features of this system?

(i) Decision Support Report	✓
(ii) Response speed	
(iii)Simple and smart Navigation	✓
(iv)Ease of use	
(v) Usefulness to perform required operation	✓
(vi)Appearance (GUI)	

5. Your views on functionalities of this system?

Excellent [✓] Good [ ] Average [ ] Poor [ ]

6. Your comments on the system as a single unit?

Excellent [✓] Good [ ] Average [ ] Poor [ ]

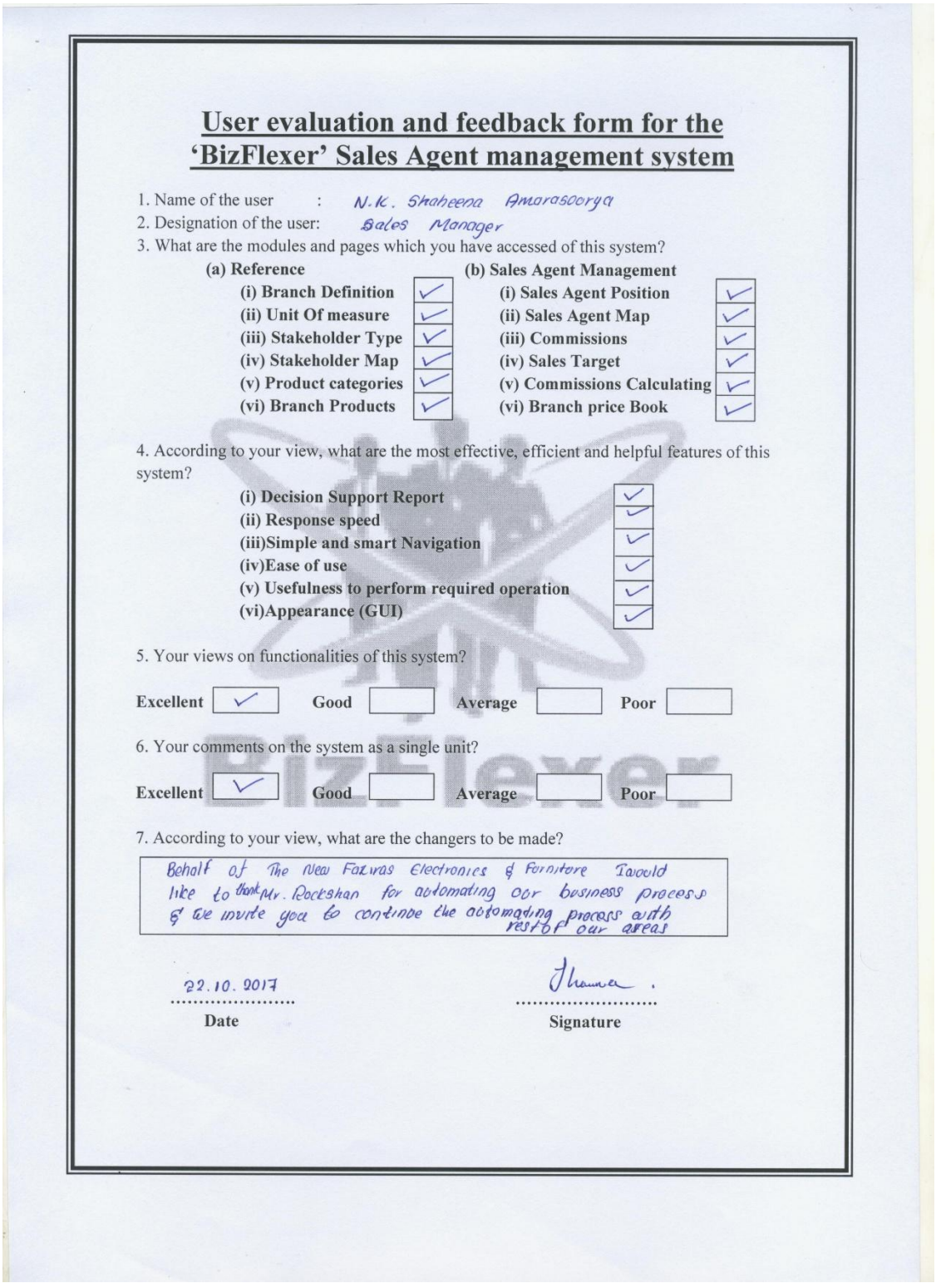
7. According to your view, what are the changers to be made?

more than a website 'Biz Flexer' is the complete solution for our organization. We appreciate your mobile version in phase two development

22.10.17
Date

Signature

Figure 5.4.: User evaluation and Feedback Form Managing Director



User evaluation and feedback form for the 'BizFlexer' Sales Agent management system

1. Name of the user : N.K. Shaheena Amarasooriya
2. Designation of the user: Sales Manager
3. What are the modules and pages which you have accessed of this system?

(a) Reference		(b) Sales Agent Management	
(i) Branch Definition	✓	(i) Sales Agent Position	✓
(ii) Unit Of measure	✓	(ii) Sales Agent Map	✓
(iii) Stakeholder Type	✓	(iii) Commissions	✓
(iv) Stakeholder Map	✓	(iv) Sales Target	✓
(v) Product categories	✓	(v) Commissions Calculating	✓
(vi) Branch Products	✓	(vi) Branch price Book	✓

4. According to your view, what are the most effective, efficient and helpful features of this system?

(i) Decision Support Report	✓
(ii) Response speed	✓
(iii)Simple and smart Navigation	✓
(iv)Ease of use	✓
(v) Usefulness to perform required operation	✓
(vi)Appearance (GUI)	✓

5. Your views on functionalities of this system?

Excellent [✓] Good [ ] Average [ ] Poor [ ]

6. Your comments on the system as a single unit?

Excellent [✓] Good [ ] Average [ ] Poor [ ]

7. According to your view, what are the changers to be made?

Behalf of The New Faziras Electronics & Furniture I would like to thank Mr. Rockshan for automating our business process & we invite you to continue the automating process with rest of our areas

22.10.2017
.....
Date

.....
Signature

Figure 5.5.: User evaluation and Feedback Form Sales Manager

5.5. Summary of Test Result

Level of Testing	Passed	Failed	Total
Unit Testing	27	0	27
Integration Testing	36	0	36
System Testing	10	0	10
UAT	10	0	10
Total	83	0	83

Table 5.5.: Summary of Test Cases

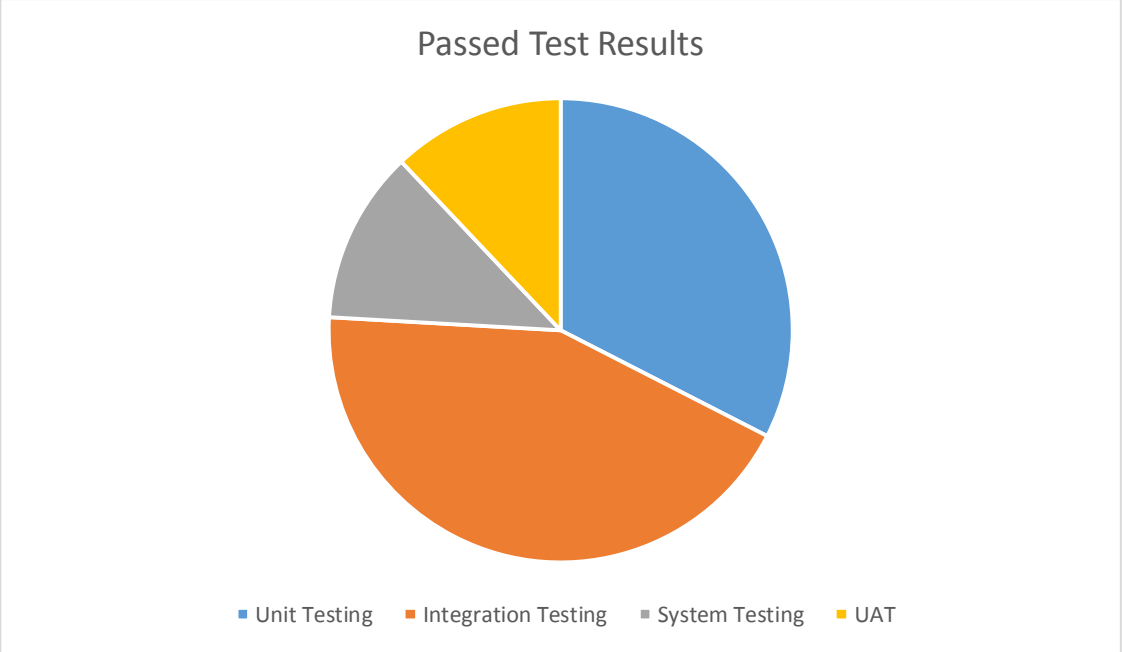


Figure 5.6.: Passed Test Result Chart

5.6. Conclusion of Test

Chapter 5 Evaluation is about testing mechanisms that used to evaluate the 'BizFlexer' agent Management System.

Therefore described the test plan used while defining different evaluation mechanisms. Final product successfully passed all the test cases and it became a successful solution to client.

Chapter 6: Conclusion

Critical evaluation, future plan, achieved Objectives, Lessons learnt and deficiencies improvements of 'BizFlexer' Agent Management System is described in Chapter 6: Conclusion.

6.1. Summary of the Project

The goal of the 'BizFlexer' system is to create an online sales agent management system that is available, efficient, and usable, an independent, online platform for client organizations that make it easier for employees to sell their lives. It was a great chance to learn so many new things in this period. Not only technological aspect but also working in a client side environment there were numerous theories that we have to learn lot.

Finally learnt lessons and theories helped to produce the exact client requirement as a software using methodologies and technologies such as RUP methodology, ASP.NET Framework, Visual Studio and also database management system such as SQL server management studio.

6.2 Lessons Learnt

Following lessons were leant from project 'BizFlexer':

- Practically experienced requirement gathering, requirements analyzing, system designing etc.
- How to give a solution for a real world problem using available resources.
- Working with a client and practiced for professional site visits.
- Have a great chance to work under well-educated and experienced supervisor.
- How to document a proposed system in while developing.
- How to develop the system as designed.
- Coding best practices such as comment important codes with a description to increase code readability.
- Keep motivating and updated to learn latest technical aspects.

- Develop a system with in a timeframe.
- Writing a timely dissertation for the project.
- Practically performing a software methodology like Rational Unified Process to achieve a goal.

Overall it was a great chance to perform as a real Software Engineer for a given period of time from BIT program.

6.3 Problems Encountered

- With the clients busy schedule it was very hard to make a site visit with a evolutionary prototype.
- Long travelling distance between the client and us is also a big barrier and it cost much to transport to make field visits.
- Getting advices from supervisor was also very difficult because of her huge responsibilities in office works.

6.4 Critical Assessment of the Project

The client practiced a paper based manual system to handle the sales agents which was highly cost and time consuming before developing this 'BizFlexer' Sales Agent Management System.

But manual paper based system was unable to perform with expected results along with highly time consuming and chargeable extra works. So by providing an automated solution to sales agent managing client organization can gain a considerable benefit.

In that situation client required to automate the business to gain competitive advantages. So this 'BizFlexer' Sales Agent Management System was designed to achieve that objectives.

The final output of 'BizFlexer' Sales Agent Management System was evaluate through Unit Testing, Integration Testing and User Acceptance Testing for a qualified user experience. Ultimately system achieved client satisfaction with the continuity of second phase development of 'BizFlexer' Sales Agent Management System.

6.5 Future Work

For inventory handling using a barcode reader is efficient than manual entry. So as a client's request 'BizFlexer' will update the barcode reading feature. Basic version of 'BizFlexer' evolutionary prototype is tested with mentioned feature.

The 'BizFlexer' client need to expand the business through the internet so future of 'BizFlexer' is also expanding to several sections one of main area is online shopping facilities with online payment. For online shopping product description views were partially developed and connecting with an online gateway is yet to complete.

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Appendix A: System Documentation

All the technical information that related to 'BizFlexer' Sales Agent Management system is described in this section. Program installation, compilation and execution details for an interested reader is below. This guide provide readers to gain complete technical knowledge of 'BizFlexer' Sales Agent Management system.

Required Tools
Following software required to install in windows 10 operating system environment.

- Visual Studio 2015.
- Microsoft SQL Server 2008.
- Crystal Report
- Google Chrome Web browser

Installing Software

[01]-Installing Internet Information Service (IIS)

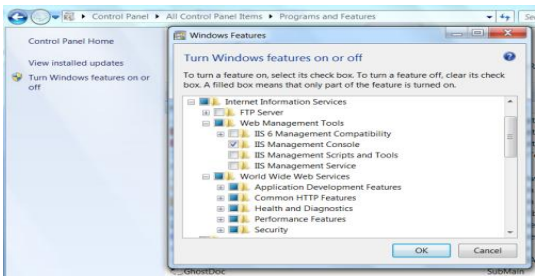


Figure A.1.: IIS (Internet Information Service) Window.

Click the Start button and then select settings menu option. Then click on the Control Panel menu. Click on the Add/Remove programs icon. After that click on the Add/Remove Windows Components icon on the left of the screen. Make sure that the following entries are checked in screen that similar to Figure 4.2.

- Internet Information Services
- World Wide Web Service

Click the OK button to follow the prompts from Windows during the IIS installation.

[02]-Installing Visual Studio

Figure A.2.: Visual Studio Setup Screen.

Double click on that Visual Studio exe file on Install Microsoft Visual Studio link to continue Visual Studio installation. After setup is completed loading of installation components, click on NEXT button.

Figure A.3.: License Agreement Screen.

Mark the checkbox indicating that you have read and accepted the license terms. Then Next button is activated, click on Next button to continue Microsoft Visual Studio installations.

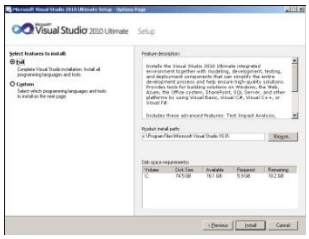


Figure A.4.: Options Screen

Click the Finish button to complete the installations.

[03]-Compiling Software

After logged in to the Web server computer as an administrator follow the steps to compile software Click Start, point to Settings, and then click Control Panel Double-click Administrative Tools, and then double-click Internet Services Manager. Click Action, point to New, and then click Web Site. After the Web Site Creation Wizard starts, click next. Type a description for the Web site.

This description is used internally to identify the Web site in Internet Services Manager only. Select the IP address to use for the site.

If you select All (unassigned), the Web site is accessible on all interfaces and all configured IP addresses. Type the TCP port number to publish the site on. Type the Host Header name (the real name that is used to access this site). Click Next. Either type the path to the folder that is holding the Web site documents or click Browse to select the folder, and then click next. Select the access permissions for the Web site, and then click next. Click Finish.

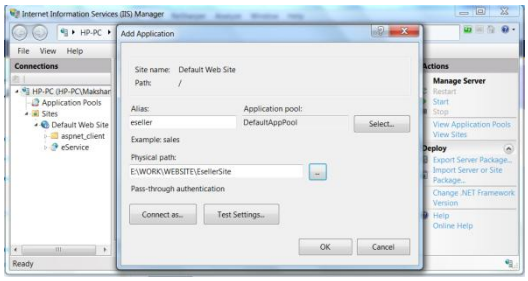


Figure A.5.: IIS Add Applications Screen

On the Build menu, click Publish Web Site. The Publish Web Site dialog box appears. In the Target Location box, enter E:\WORK\WEBSITE\BizFlexerSite.For the purposes of this walkthrough, you are publishing to a local folder. If you wanted to publish to a remote Web site using HTTP or FTP the Target Location box is where you would specify the remote server URL.

Clear allow this precompiled site to be updatable. This option specifies that all program code is compiled into assemblies, but that pages and user controls (.aspx, .ascx, and .master files) are copied as-is to the target folder and can be updated as text files without recompiling the project. In this walkthrough, you will not select that option Click OK. Visual Studio precompiled the contents of the Web site and writes the output to the folder that you specified. The Output window displays progress messages. If an error occurs during compilation, it is reported in the Output window.

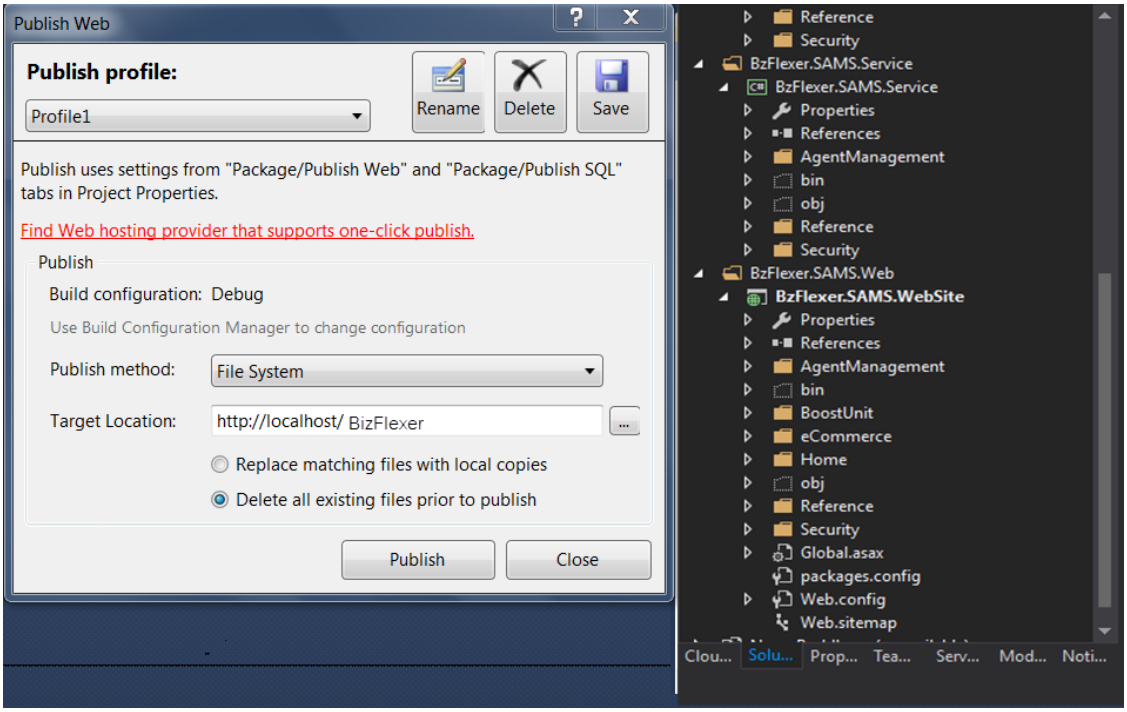


Figure A.6.: Visual Studio Web Publish Window.

[04]-Executing 'BizFlexer' Software

- Open up a web browser.
- Type http://localhost/bizflexer address bar and load the application.

Appendix B: Design Documentation

Appendix B: Design Documentation is describe most important design documents of ‘BizFlexer’ Sales Agent Management System.

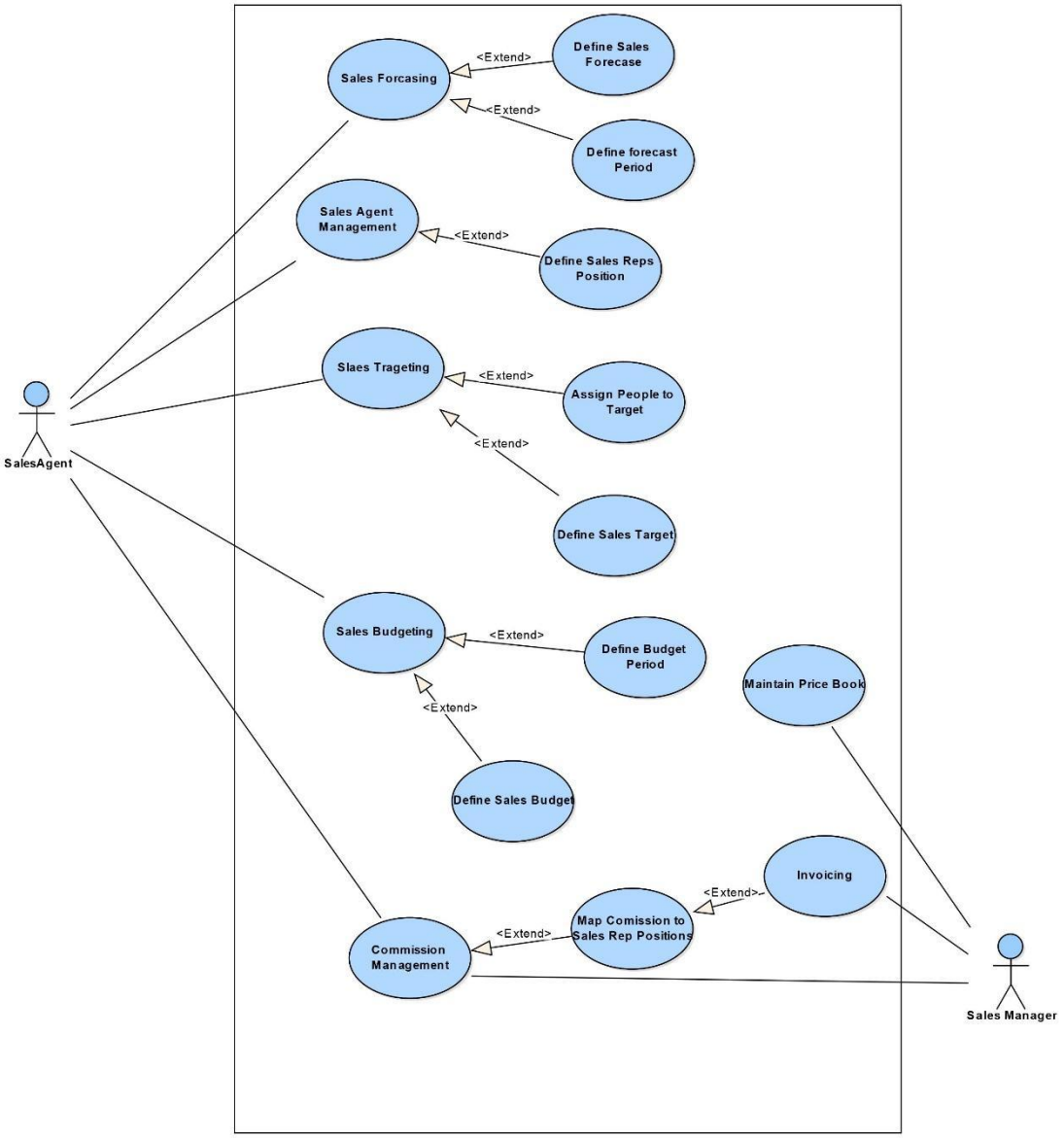


Figure B.1.: Top-Level Use Case Diagram for the Proposed System

Activity Diagram

Figure B.2.: Activity Diagram for the Proposed System. Used to explain how the system dynamically manage reference data while executing parallel activities.

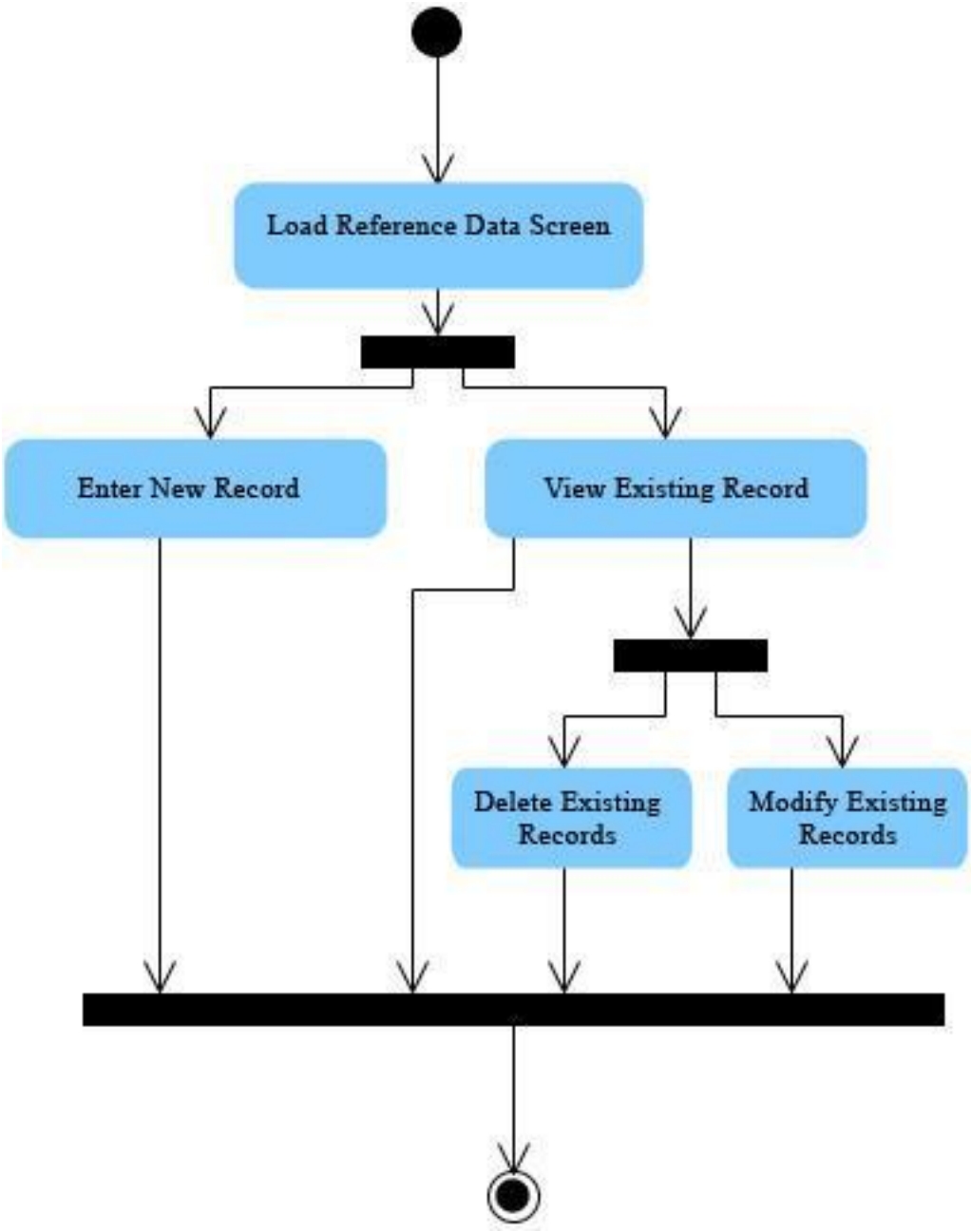


Figure B.2.: Activity Diagram for the Proposed System

Data Modeling Method Diagrams for the System

Object Oriented Structural Diagrams

[01]-Class Diagram

Figure B.3.: Class Diagram for the Proposed System is a static structure diagram that shows how the agent management structured with relations of classes.

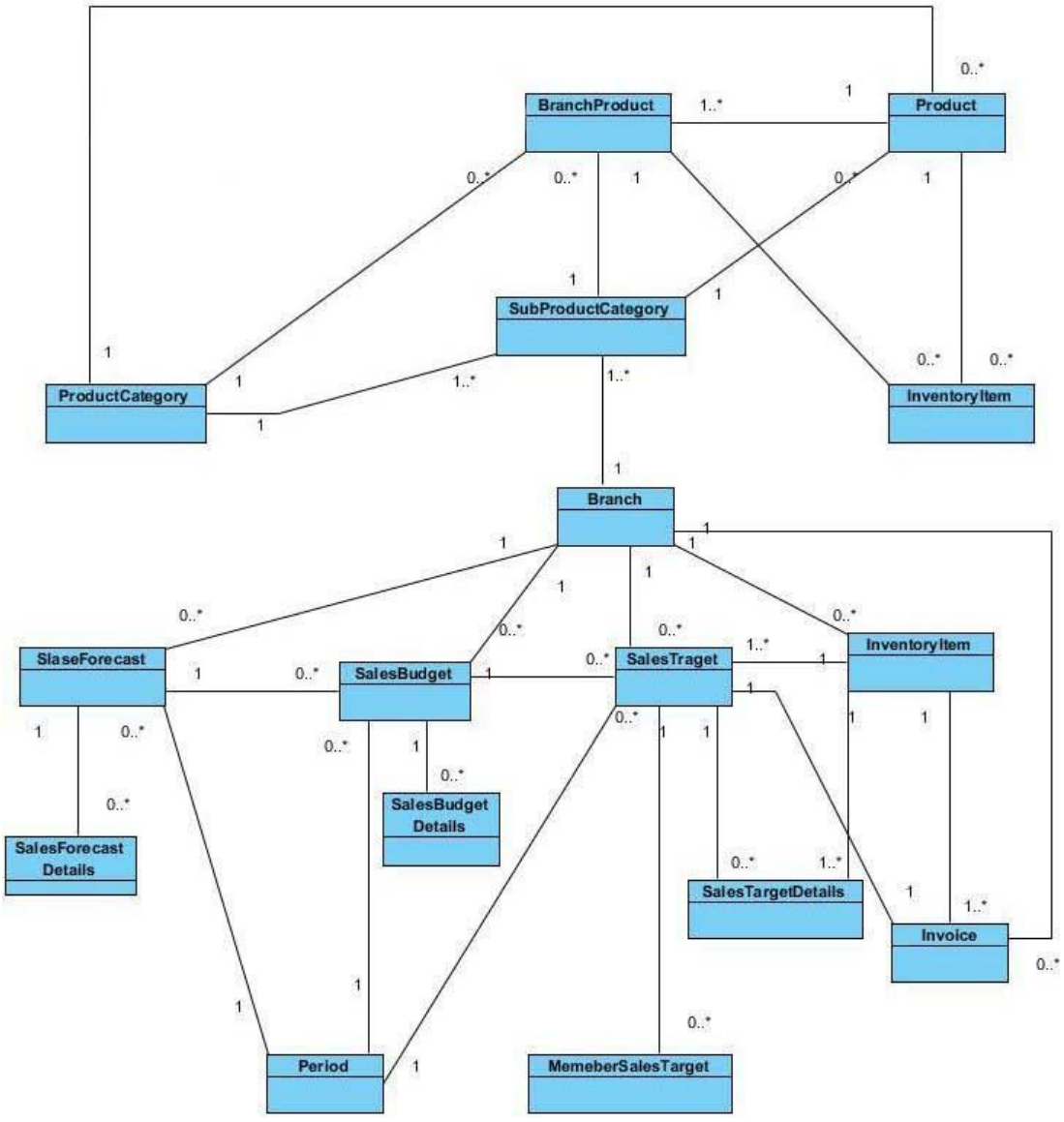


Figure B.3.: Class Diagram for the Proposed System

[02]-Sequence Diagram

Sequence diagram explains how system elements operate one another and order of that. Sequence diagram as ***Figure B.4.: Proposed System - Sequence Diagram*** below.

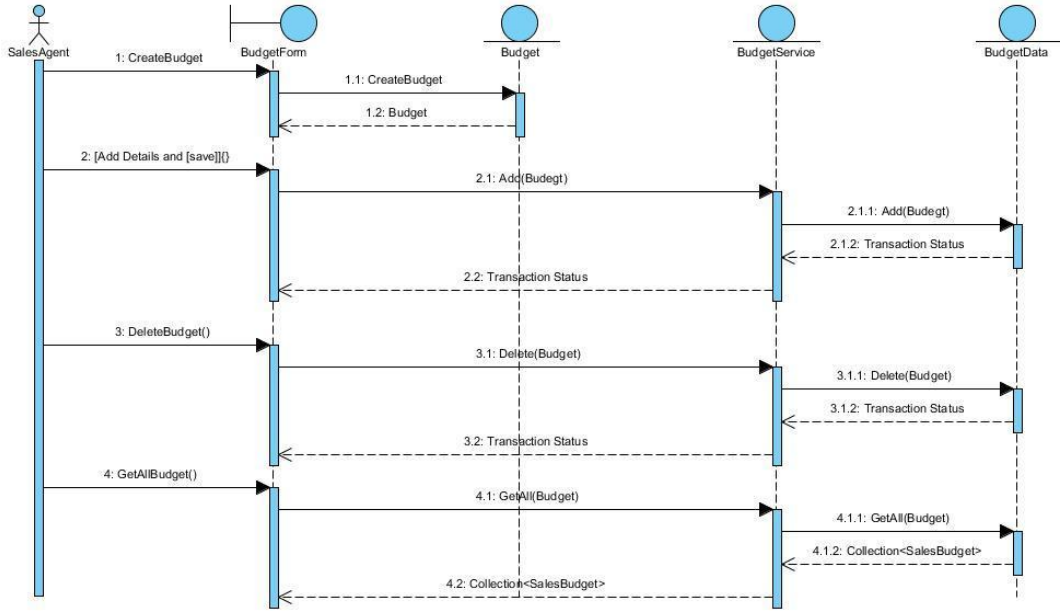


Figure B.4.: Sequence Diagram for the Proposed System

Rational Unified Process

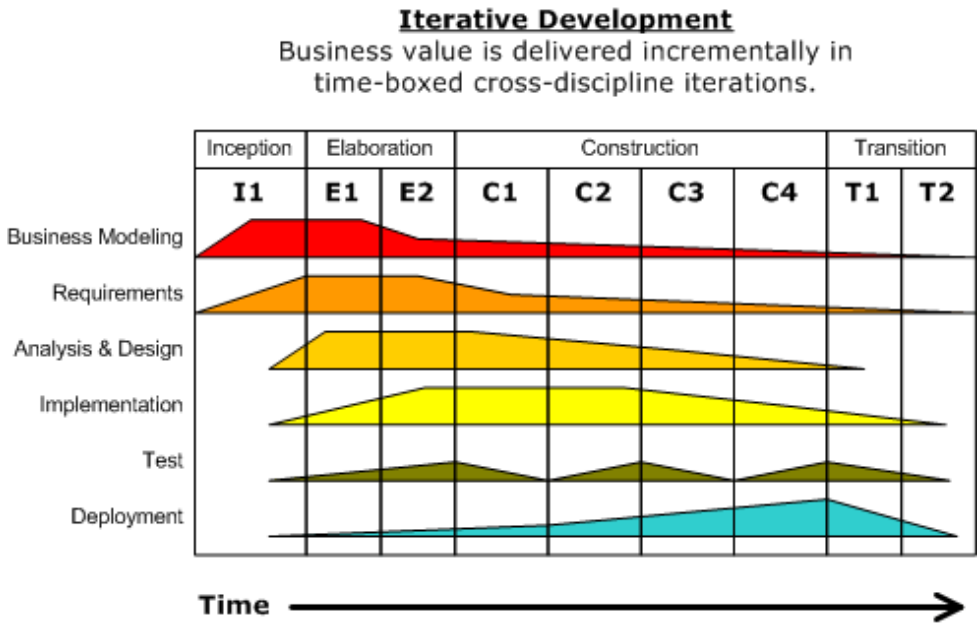


Figure B.5.: Rational Unified Process (Pic. from wikipedia.org)

N-Tier Architecture

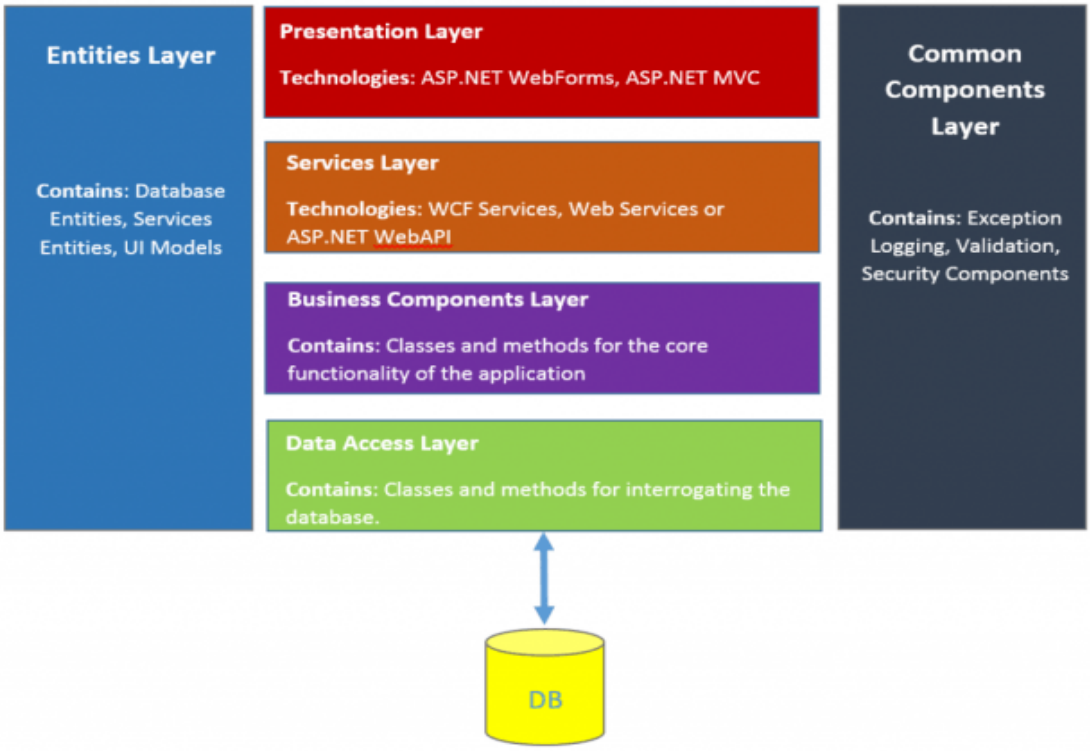


Figure B.6.: N tier Architecture (Pic. from dotnetdaily.net)

User Interfaces of the System

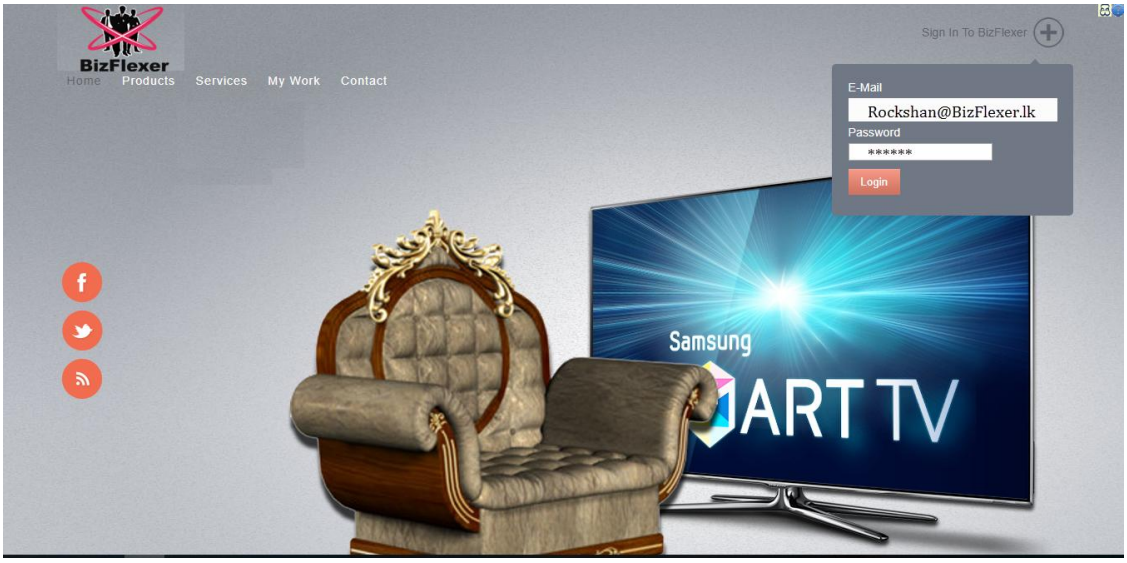


Figure B.7.: User Login Window

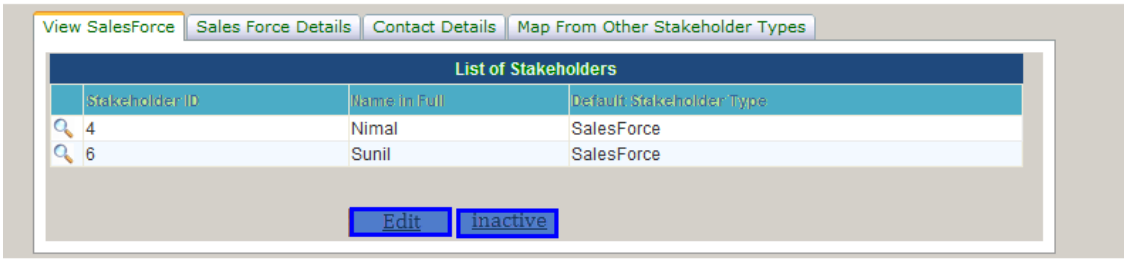


Figure B.8.: Sales gents Details Window

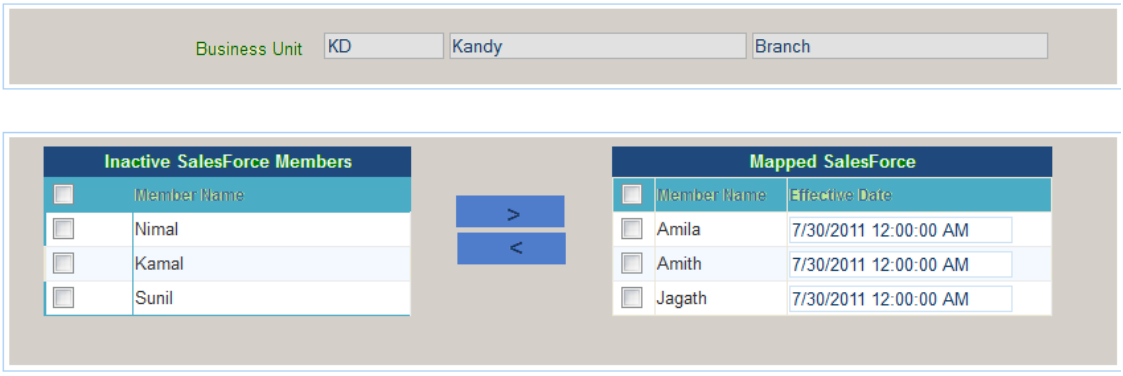
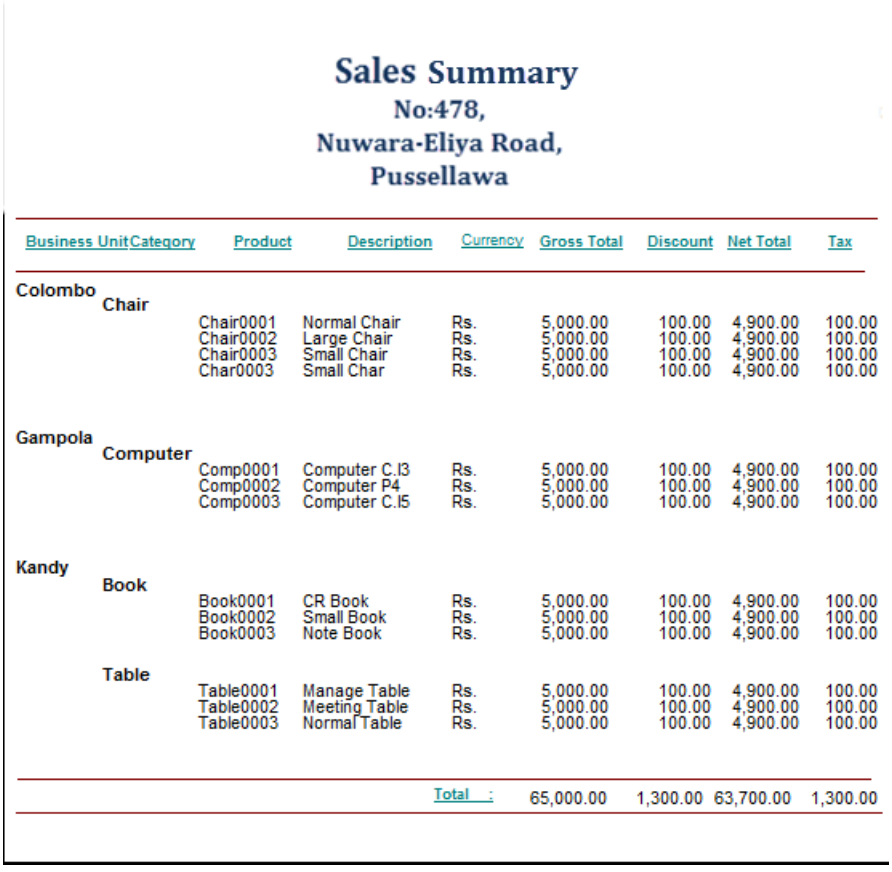


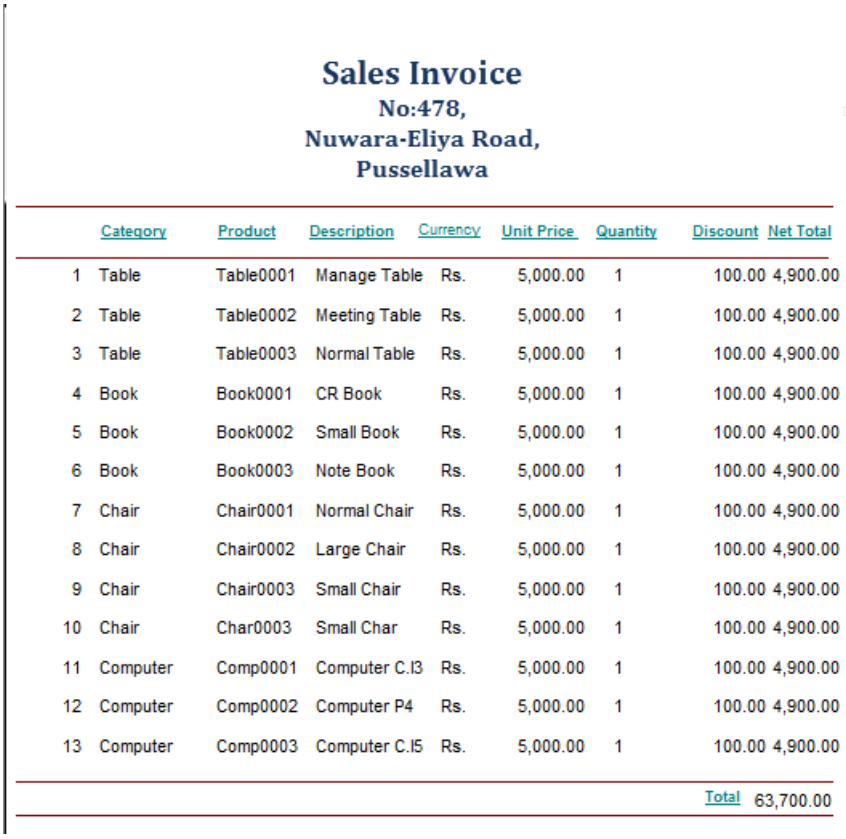
Figure B.9.: Sales Agent Map Window



Sales Summary
No:478,
Nuwara-Eliya Road,
Pussellawa

Business Unit	Category	Product	Description	Currency	Gross Total	Discount	Net Total	Tax
Colombo	Chair	Chair0001	Normal Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Chair0002	Large Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Chair0003	Small Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Char0003	Small Char	Rs.	5,000.00	100.00	4,900.00	100.00
Gampola	Computer	Comp0001	Computer C.I3	Rs.	5,000.00	100.00	4,900.00	100.00
		Comp0002	Computer P4	Rs.	5,000.00	100.00	4,900.00	100.00
		Comp0003	Computer C.I5	Rs.	5,000.00	100.00	4,900.00	100.00
Kandy	Book	Book0001	CR Book	Rs.	5,000.00	100.00	4,900.00	100.00
		Book0002	Small Book	Rs.	5,000.00	100.00	4,900.00	100.00
		Book0003	Note Book	Rs.	5,000.00	100.00	4,900.00	100.00
	Table	Table0001	Manage Table	Rs.	5,000.00	100.00	4,900.00	100.00
		Table0002	Meeting Table	Rs.	5,000.00	100.00	4,900.00	100.00
		Table0003	Normal Table	Rs.	5,000.00	100.00	4,900.00	100.00
				Total :	65,000.00	1,300.00	63,700.00	1,300.00

Figure B.10.: Sales Summary Report



Sales Invoice

No:478,
Nuwara-Eliya Road,
Pussellawa

	Category	Product	Description	Currency	Unit Price	Quantity	Discount	Net Total
1	Table	Table0001	Manage Table	Rs.	5,000.00	1	100.00	4,900.00
2	Table	Table0002	Meeting Table	Rs.	5,000.00	1	100.00	4,900.00
3	Table	Table0003	Normal Table	Rs.	5,000.00	1	100.00	4,900.00
4	Book	Book0001	CR Book	Rs.	5,000.00	1	100.00	4,900.00
5	Book	Book0002	Small Book	Rs.	5,000.00	1	100.00	4,900.00
6	Book	Book0003	Note Book	Rs.	5,000.00	1	100.00	4,900.00
7	Chair	Chair0001	Normal Chair	Rs.	5,000.00	1	100.00	4,900.00
8	Chair	Chair0002	Large Chair	Rs.	5,000.00	1	100.00	4,900.00
9	Chair	Chair0003	Small Chair	Rs.	5,000.00	1	100.00	4,900.00
10	Chair	Char0003	Small Char	Rs.	5,000.00	1	100.00	4,900.00
11	Computer	Comp0001	Computer C.I3	Rs.	5,000.00	1	100.00	4,900.00
12	Computer	Comp0002	Computer P4	Rs.	5,000.00	1	100.00	4,900.00
13	Computer	Comp0003	Computer C.I5	Rs.	5,000.00	1	100.00	4,900.00
							Total	63,700.00

Figure B.11.: Sales Invoice Report

Table Structures

Table Name Status

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
StatusId	PK	bigint		A
Code		varchar		
Description		varchar		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table B.1.: 'Status' Table Structure

Table Name SalesAgentPosition

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
Code		nvarchar	8	
Description		nvarchar	50	
DirectCommissionRate		decimal		
IndirectCommissionRate				
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table B.2.: 'Agents Position' Table Structure

Table Name SalesAgentStructure

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
ParentSalesAgentStructureId		bigint		
SalesForceStructureId		bigint		
BusinessUnitListId		bigint		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table B.3.: 'Agent' Table Structure

Table Name SalesAgentTeamMembers

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesAgentTeamId		bigint		
SalesForceStructureId		bigint		
StakeholderId		bigint		
ActiveDate		DateTime		
InactiveDate		nvarchar	50	

Table B.4.: 'Members' Table Structure

Table Name Commission

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesAgentTeamMembersId		bigint		
SalesForceStructureId		bigint		
StakeholderId		bigint		
DirectCommissionTotalSales		Boolean		
DirectCommissionSalesProfit		Boolean		
IndirectCommissionTotalSales				
IndirectCommissionSalesFrofit				
OtherCommission				
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table B.5.: 'Commissions' Table Structure

Table Name SalesTargetDetails

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesTargetId	FK	bigint		A
BusinessUnitListProductId		bigint		
Quantity		bigint		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table B.6.: 'Sales Target' Table Structure

Table Name SalesTeamSalesTarget

Field name	Constraint/ Domain Values	Data Type	Length	E / D / R/A
Id	PK	bigint		A
SalesTargetId	FK	bigint		A
SalesForceTeamMembersId	PK	bigint		A
EffectiveDate		DateTime		
ModifiedDate		DateTime		
CreatedDate		DateTime		

Table B.7.: 'Sales Team' Table Structure

Appendix C: User Documentation

Appendix C User documentation provides the necessary guidelines to operate the 'BizFlexer' Sales Agent Management system.

'BizFlexer' Sales Agent Management system was mainly contained with GUI which described under five levels. There were,

I. Welcome Page
II. Home Page
III. Navigation Window
IV. Web pages
V. Reports

[i] Welcome Page

First step of common 'BizFlexer' was Welcome page which provides business and system information to user. Top right corner welcome page consist of plus signed icon and by clicking user can access login modal as following figure C1.

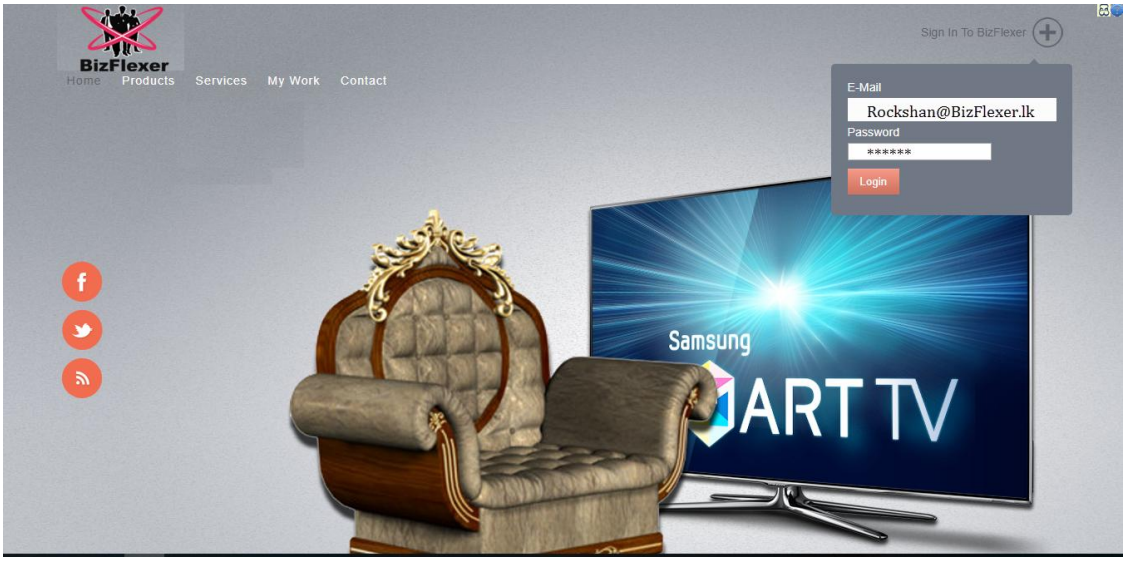


Figure C.1.: Welcome Page

[ii] Home Page

Home page can be reached only for success logons. Home Page mainly provide four type of navigation buttons which user can performed different business and user operations.

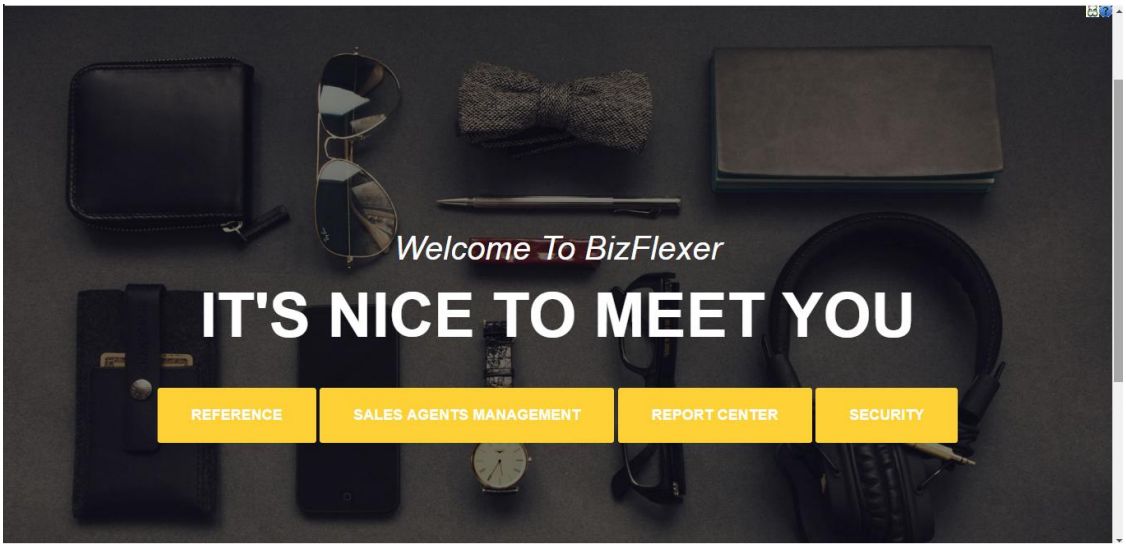


Figure C.2.: Home Page

[iii] Navigation Window

Next step of Home page is Navigating window. 'BizFlexer' Agent Management System Contained with a smart Navigation window with many features and following figure detail describes that for **all kind of users.** . Now 'BizFlexer' user is ready to perform business operations using web pages.

Figure C.3.: Navigation Page

[iv] Web Pages

The next level of 'BizFlexer' UI was web pages .Main objective of following web pages were to perform business units efficiently and effectively for that purpose 'BizFlexer' used simple UI components such as buttons, data grids, text boxes and check boxes. By using simple UI components 'BizFlexer' expand the easy learning feature not only that but also user can understand what operations can be performed. Following figures depict web pages.

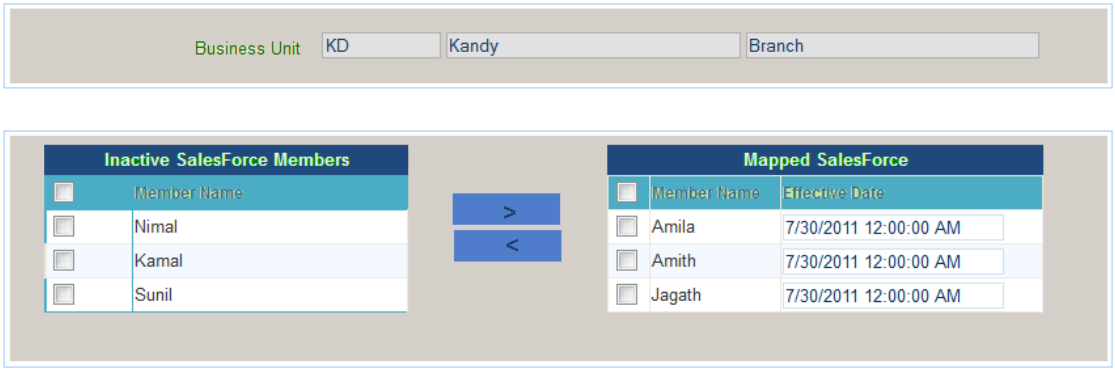


Figure C.4.: Business Unit Sales Force Details

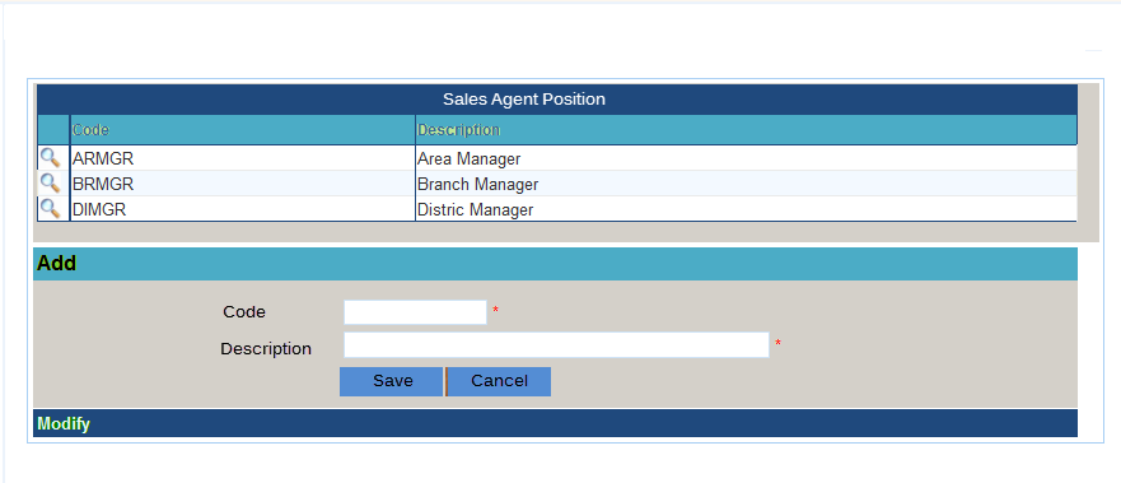


Figure C.5.: Sales Force Position

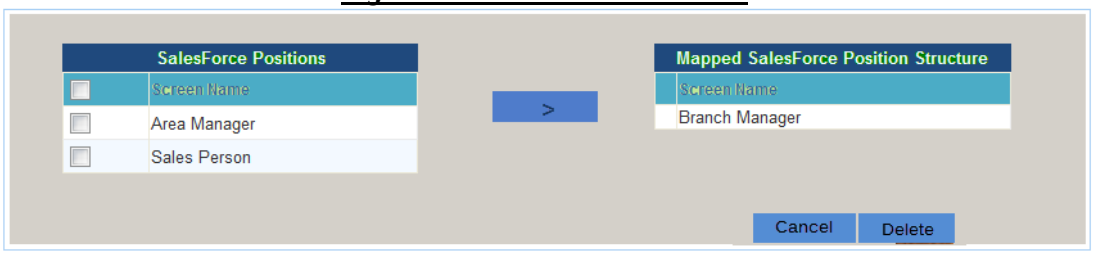


Figure C.6.: Sales Force Position Structure

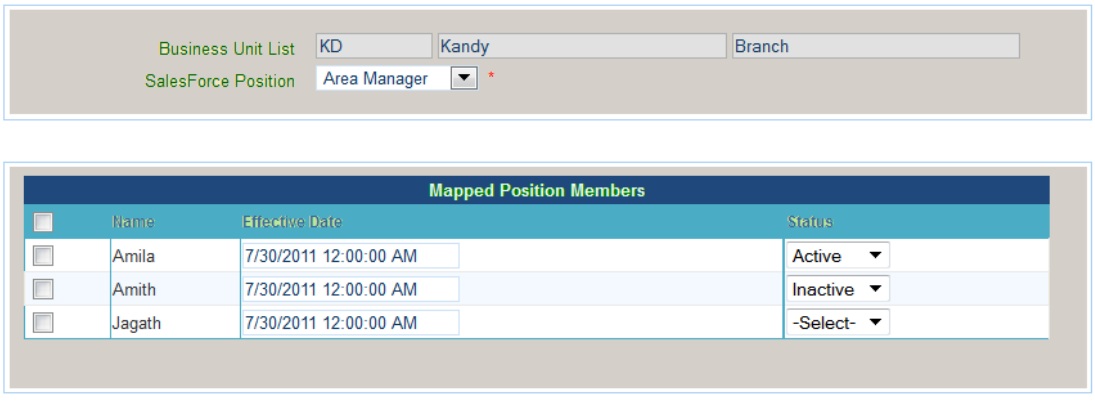


Figure C.7.: Assign Members to Sales Force Position

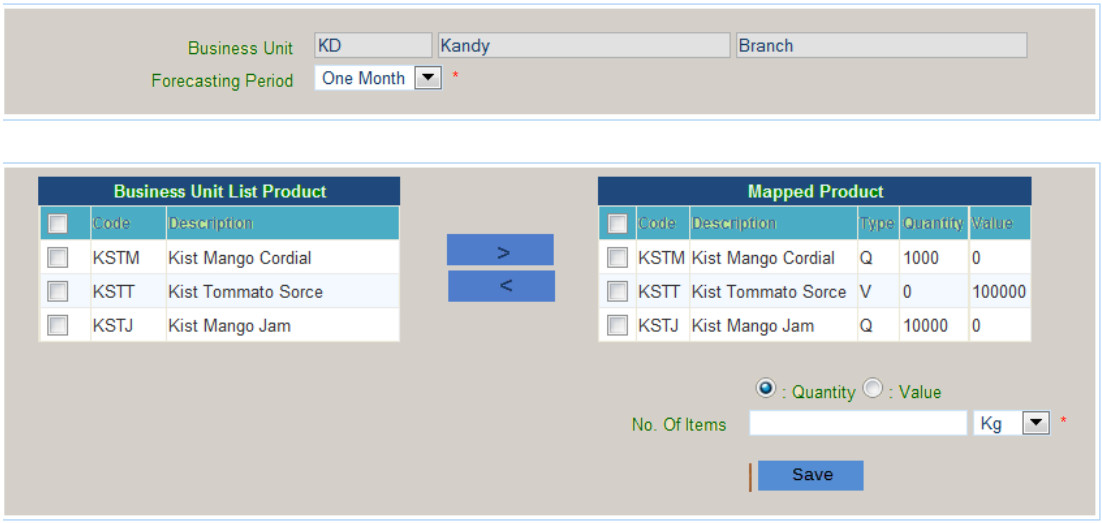


Figure C.8.: Sales Forecasting

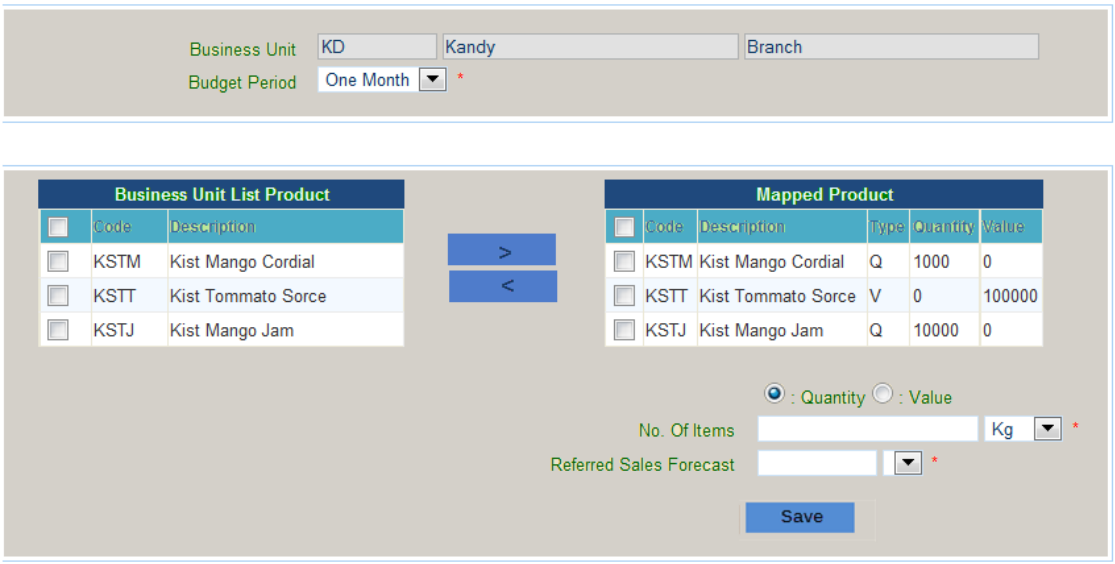


Figure C.9.: Sales Budgeting

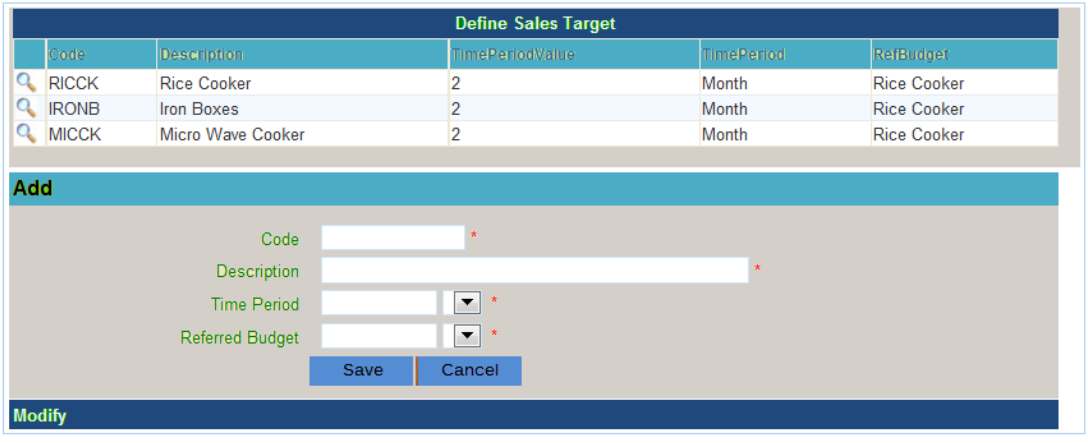


Figure C.10.: Define Target Details

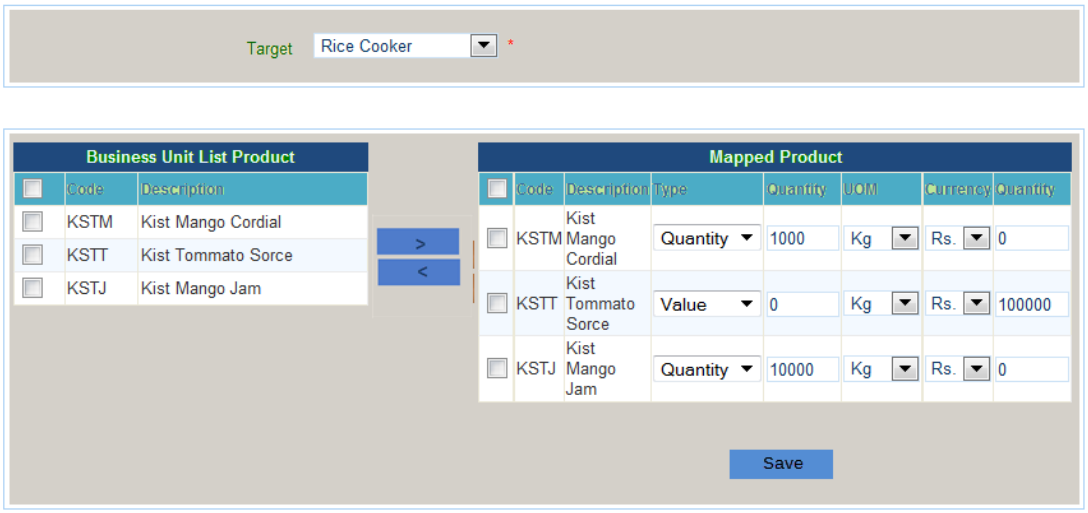


Figure C.11.: Sales Target Details

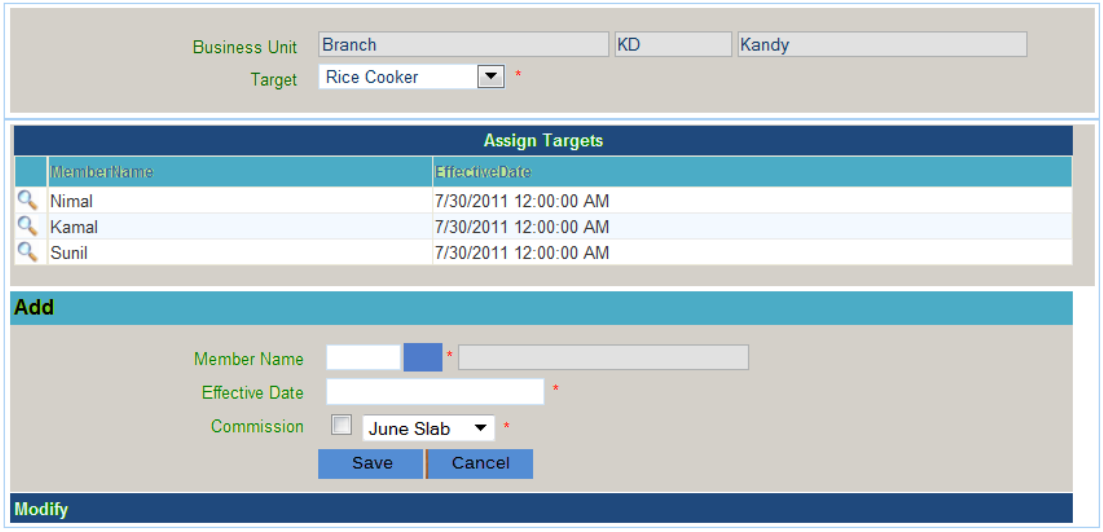


Figure C.12.: Assign Target to Sales Force

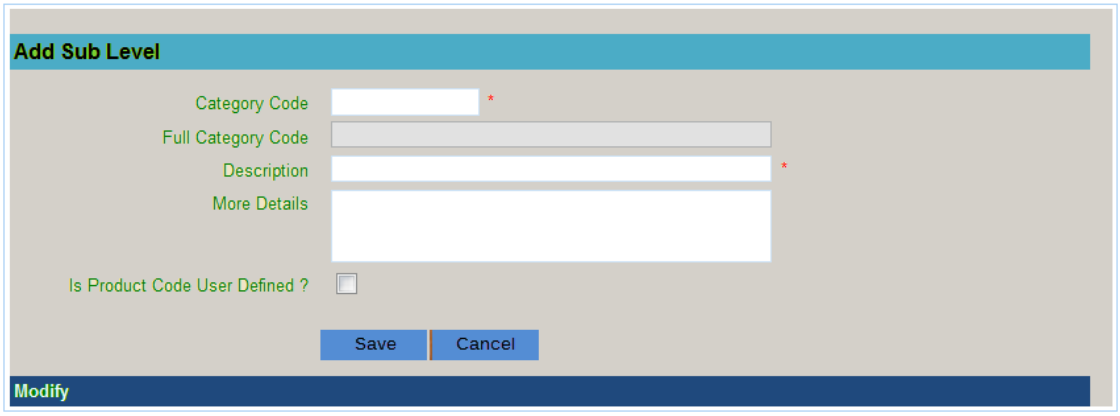


Figure C.14.: Product Category

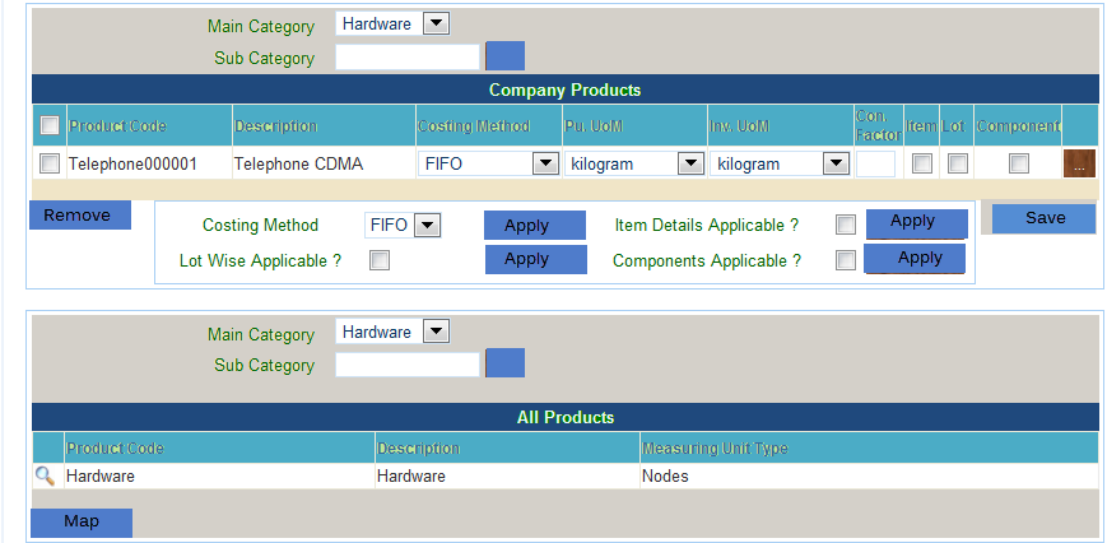


Figure C.15.: Company Product

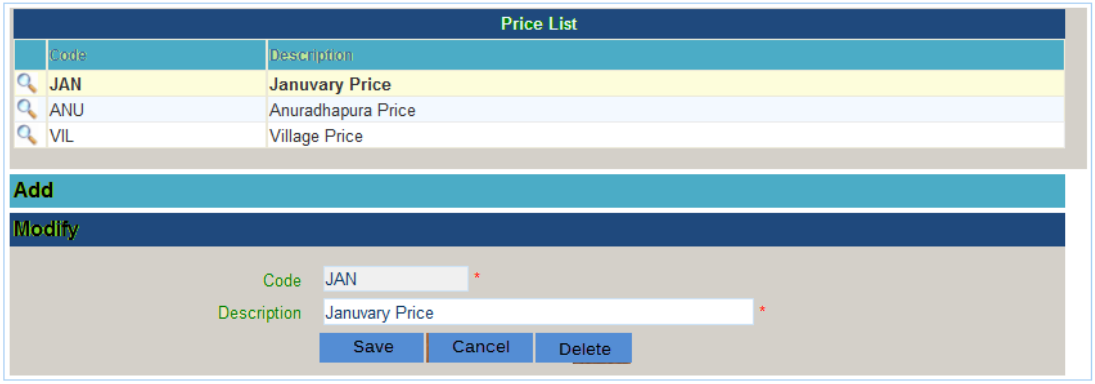


Figure C.16.: Price List

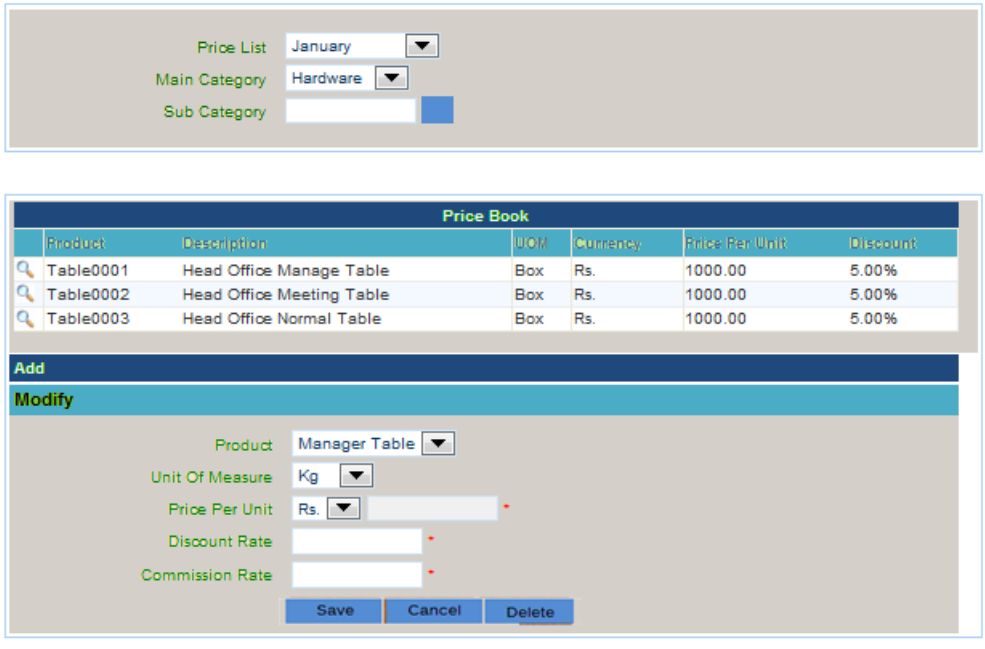


Figure C.17.: Price Book

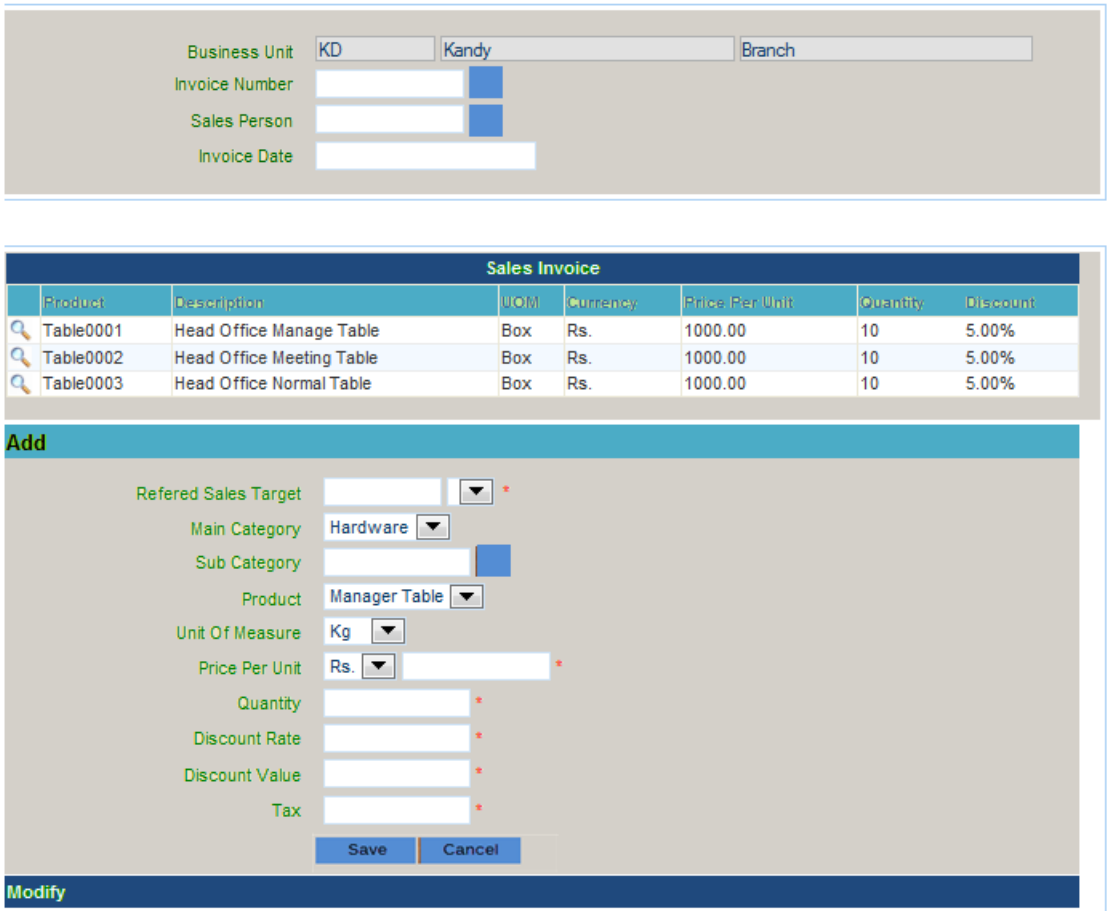


Figure C.18.: Sales Invoice

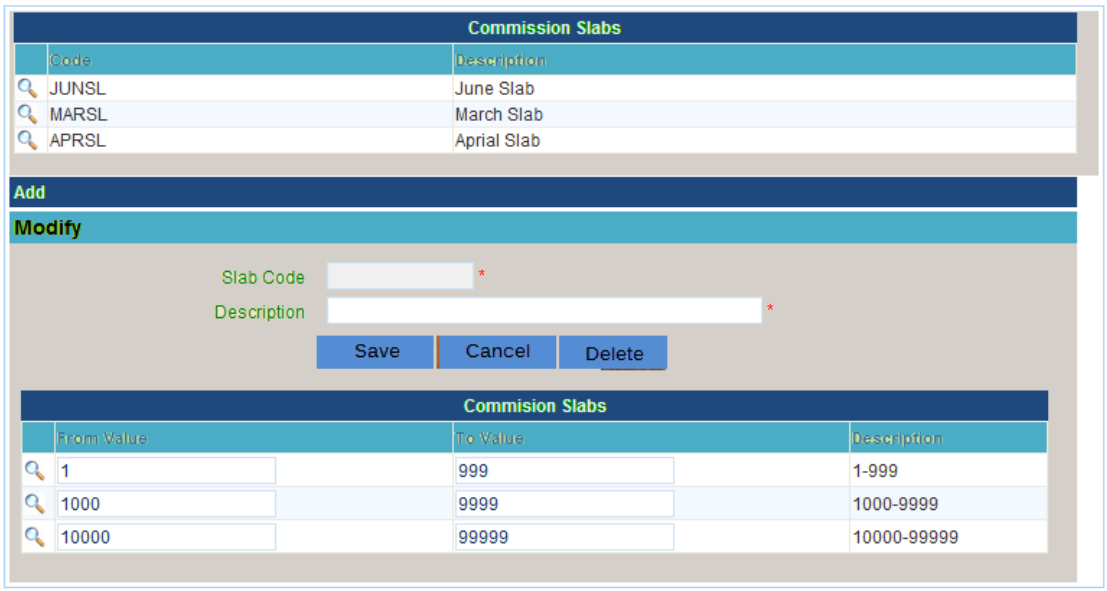


Figure C.20.: Commission Slabs

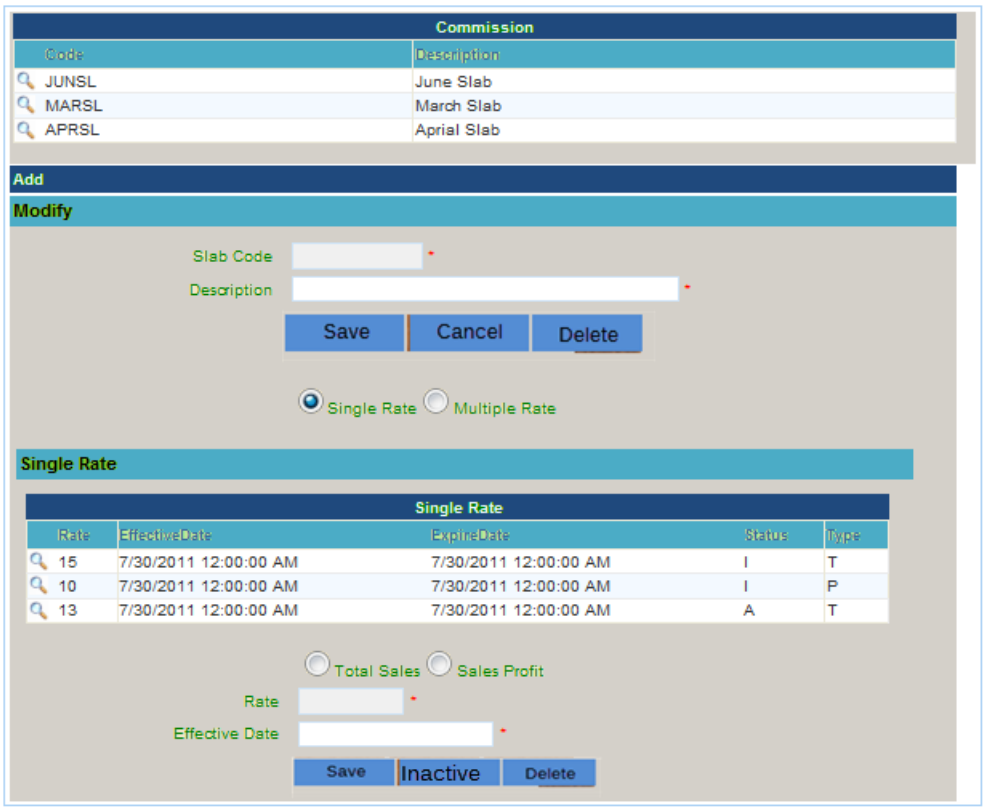


Figure C.21.: Define Commission

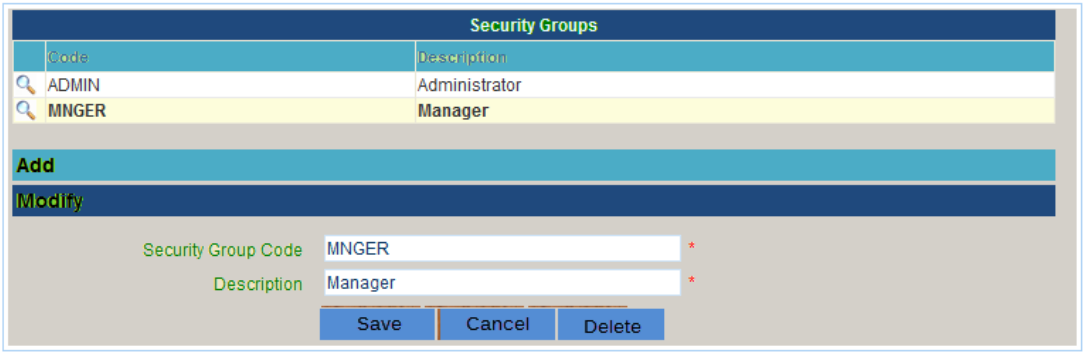


Figure C.22.: Define Security Groups

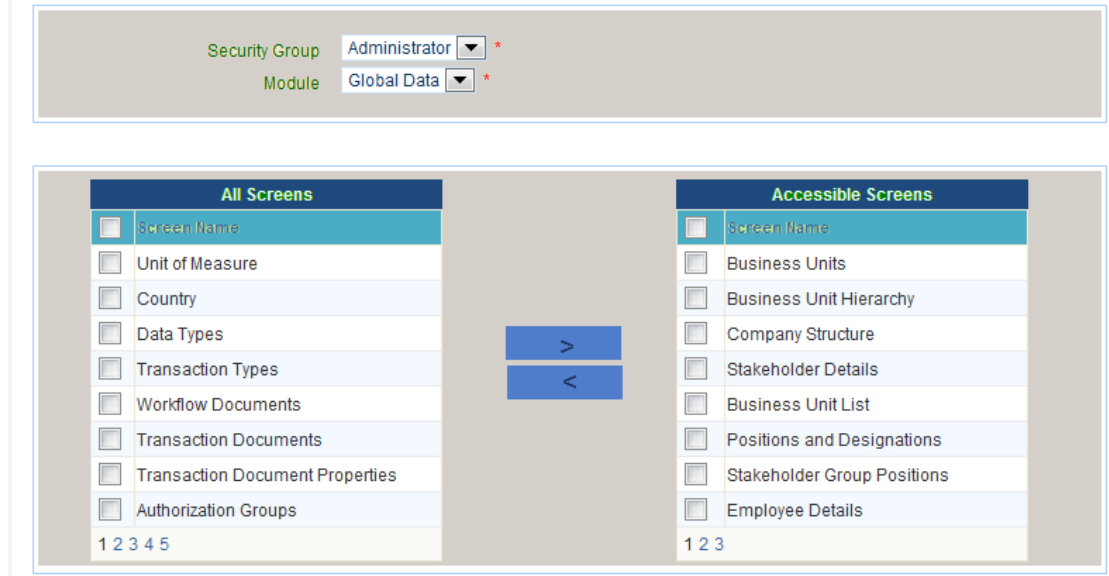


Figure C.23.: Screen Permission

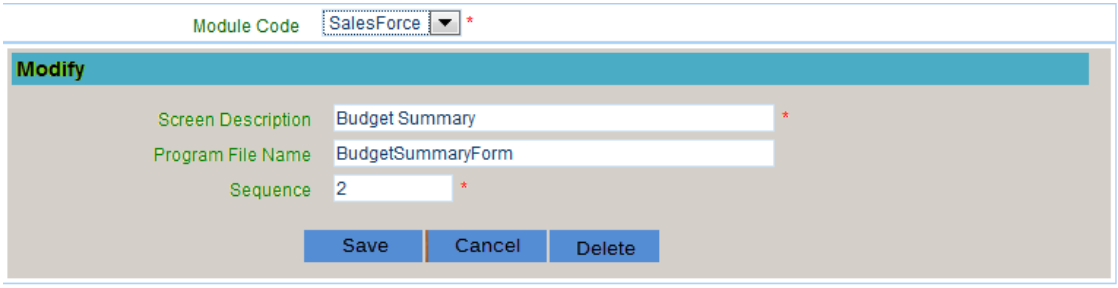


Figure C.24.: Define Security Groups

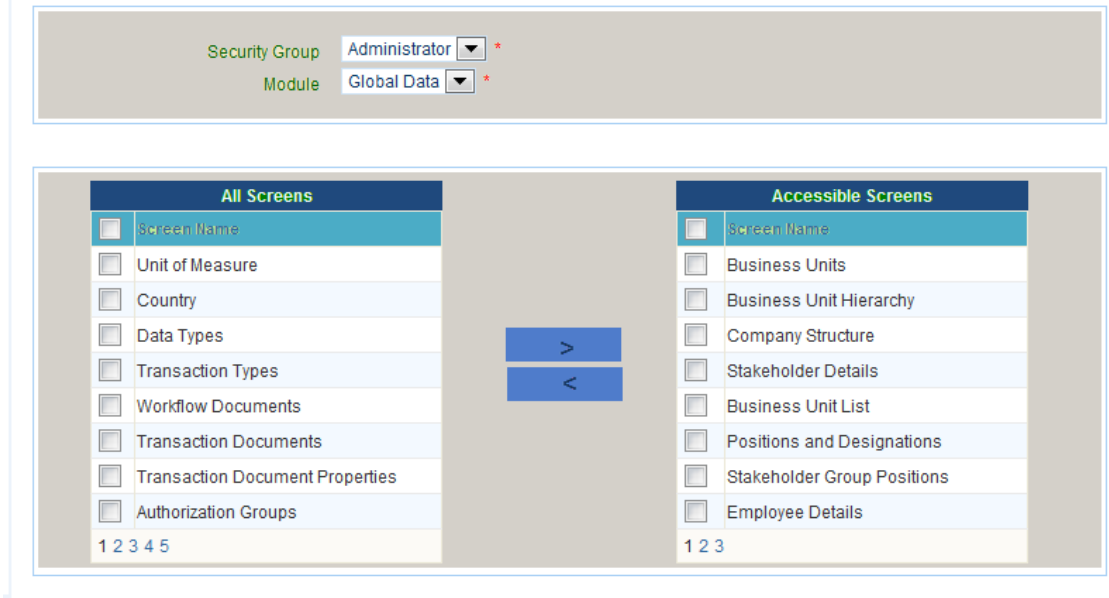


Figure C.25.: Screen Permission

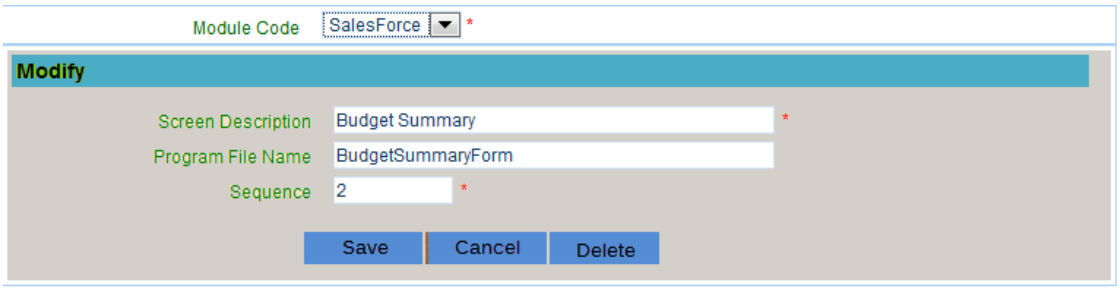


Figure C.26.: System Menu Handling

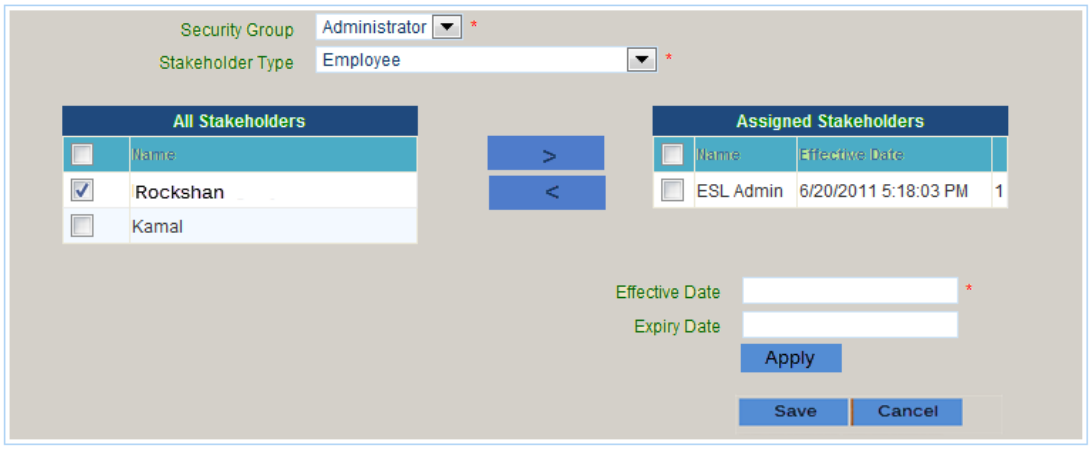


Figure C.27.: User Permission

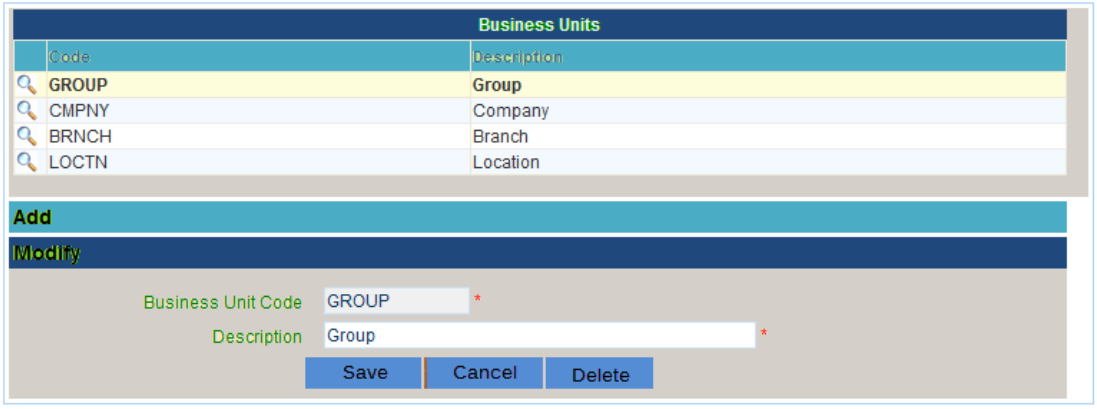


Figure C.28.: Define Business Units

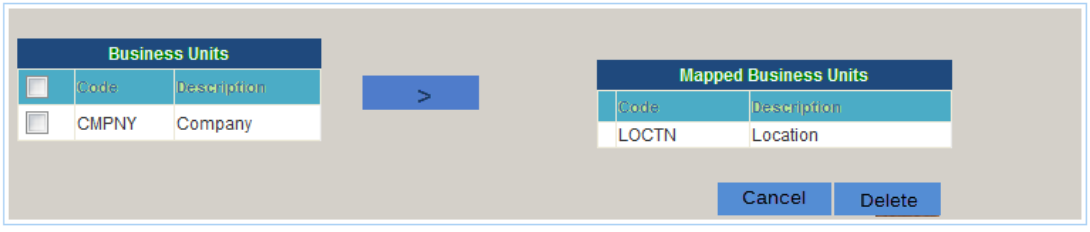


Figure C.29.: Define Business Unit Hierarchy

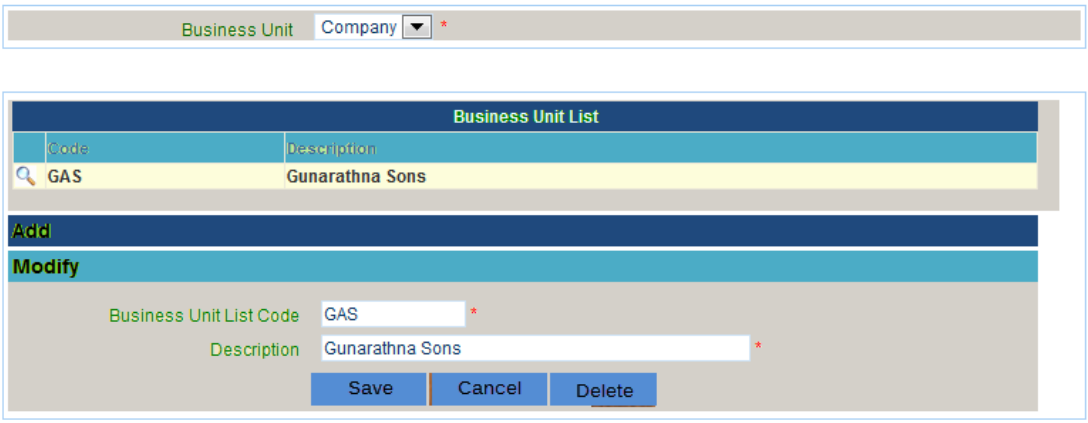


Figure C.30.: Define Business Unit List

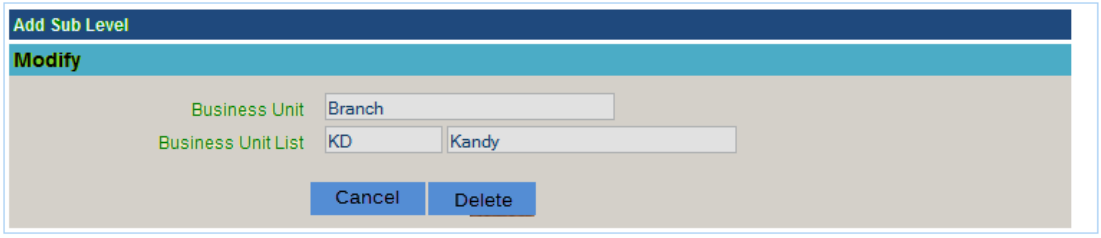


Figure C.31.: Define Company Structure

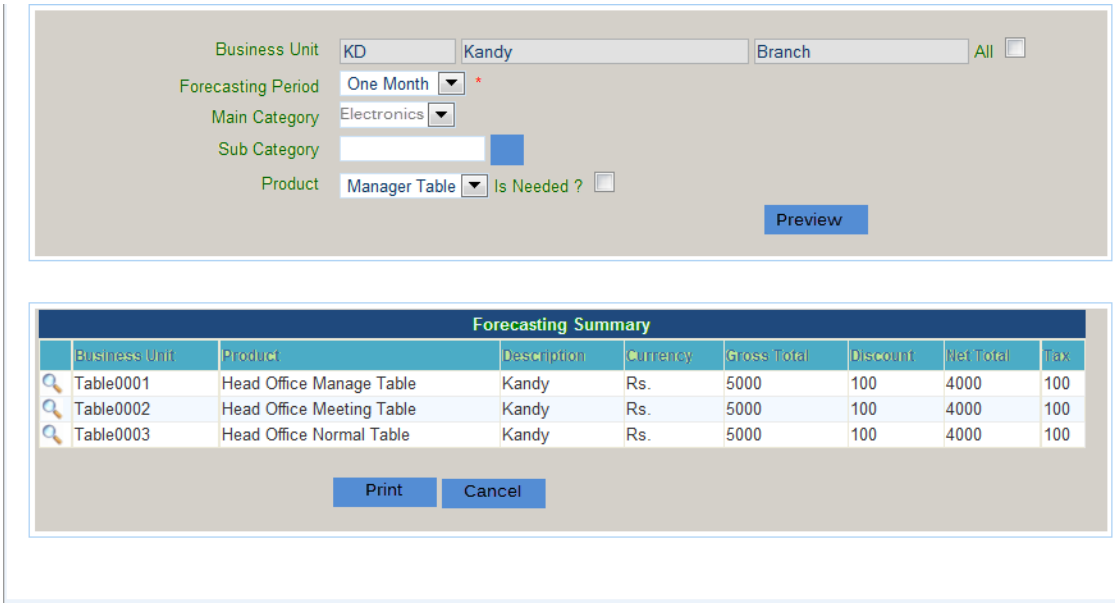


Figure C.32.: Forecasting Summery Screen

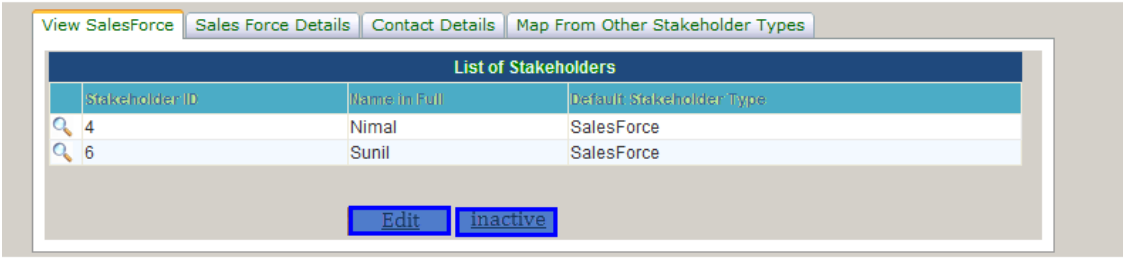


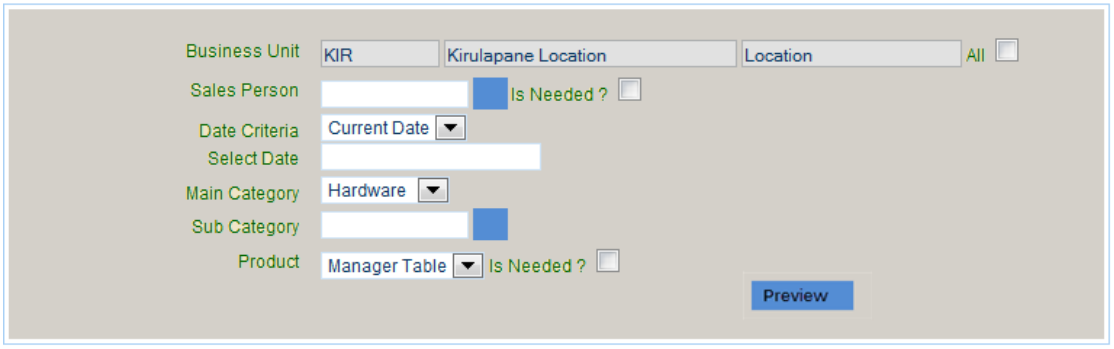
Figure C.33.: Sales gents Details Window

Appendix D: Management Reports

One of major objective of project 'BizFlexer' was generating report with highly decision taking support. Following section contained with some of major 'BizFlexer' reports with a brief explanation.

Sales Summary

Sales summary report featured with multi sorting facility that help to obtain competitive advantage to 'BizFlexer' client.



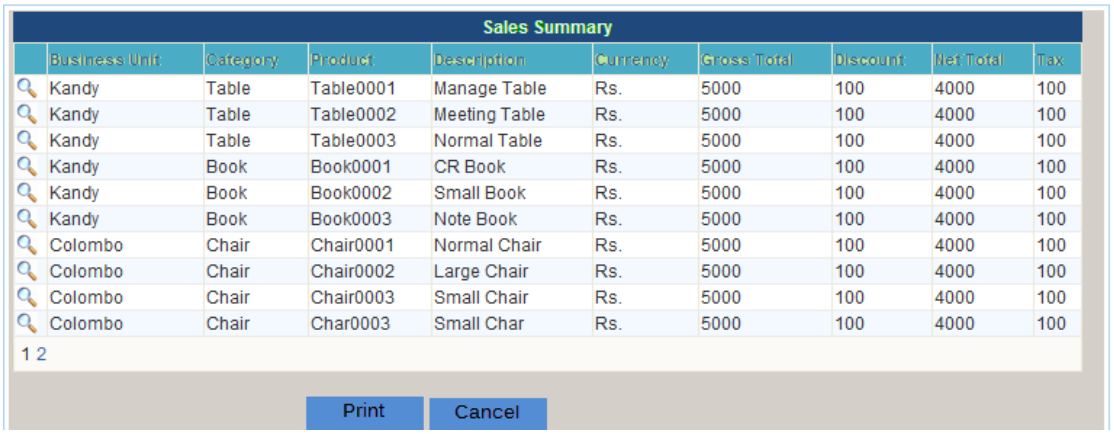


Figure D.1.: Management Reports-Sales Summary

Sales Commissions Summary

This report help to view and analyses commissions under various scenarios. Commission report can produce printable output as other reports that generated using 'BizFlexer'.

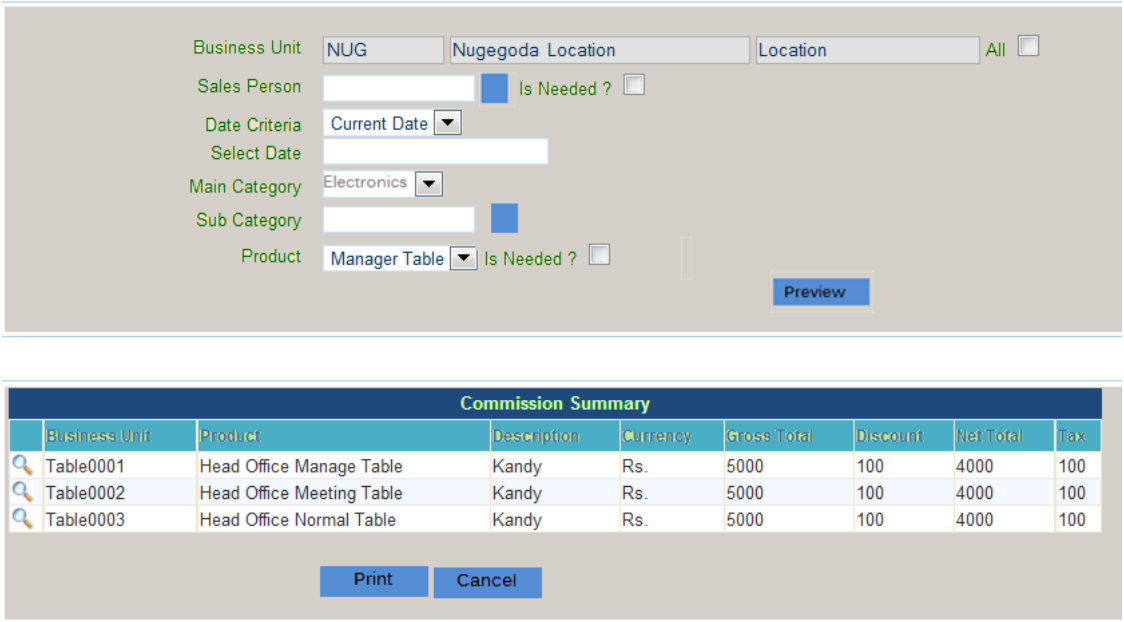


Figure D.2.: Management Reports-Sales Commissions Summary

Sales Target Summary

Sales target can be viewed under differently sorted reports. Highly decision supportive report that available in 'BizFlexer'.

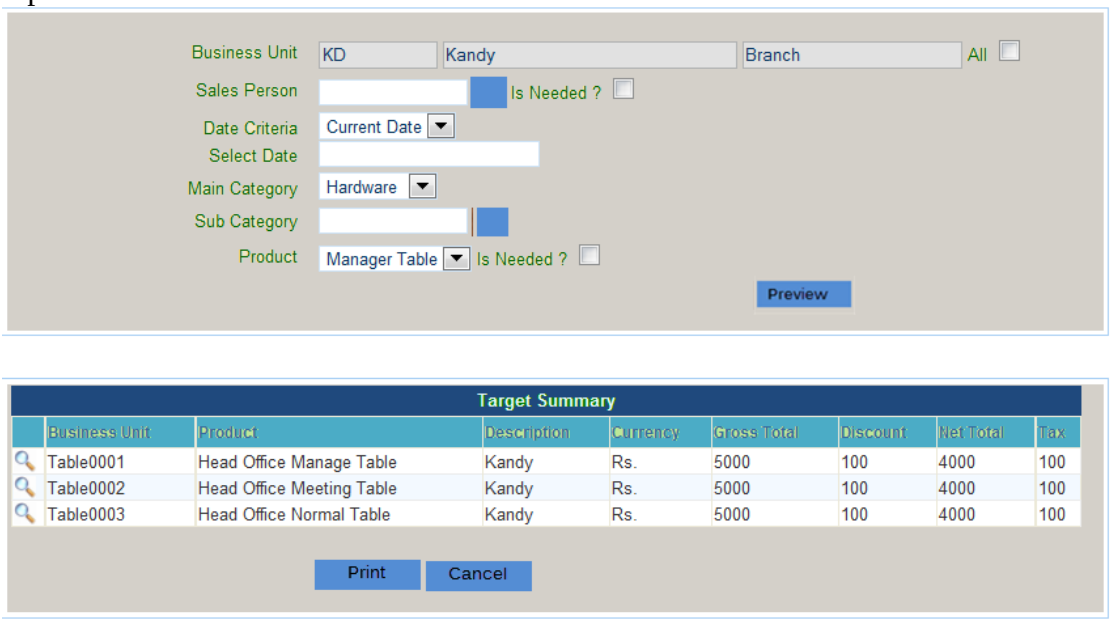


Figure D.3.: Management Reports-Sales Target Summary

Printed version of Summary Reports

Sales Invoice
No:478,
Nuwara-Eliya Road,
Pussellawa

	Category	Product	Description	Currency	Unit Price	Quantity	Discount	Net Total
1	Table	Table0001	Manage Table	Rs.	5,000.00	1	100.00	4,900.00
2	Table	Table0002	Meeting Table	Rs.	5,000.00	1	100.00	4,900.00
3	Table	Table0003	Normal Table	Rs.	5,000.00	1	100.00	4,900.00
4	Book	Book0001	CR Book	Rs.	5,000.00	1	100.00	4,900.00
5	Book	Book0002	Small Book	Rs.	5,000.00	1	100.00	4,900.00
6	Book	Book0003	Note Book	Rs.	5,000.00	1	100.00	4,900.00
7	Chair	Chair0001	Normal Chair	Rs.	5,000.00	1	100.00	4,900.00
8	Chair	Chair0002	Large Chair	Rs.	5,000.00	1	100.00	4,900.00
9	Chair	Chair0003	Small Chair	Rs.	5,000.00	1	100.00	4,900.00
10	Chair	Char0003	Small Char	Rs.	5,000.00	1	100.00	4,900.00
11	Computer	Comp0001	Computer C.I3	Rs.	5,000.00	1	100.00	4,900.00
12	Computer	Comp0002	Computer P4	Rs.	5,000.00	1	100.00	4,900.00
13	Computer	Comp0003	Computer C.I5	Rs.	5,000.00	1	100.00	4,900.00
						Total		63,700.00

Figure D.4.: Management Reports-Sales Invoice

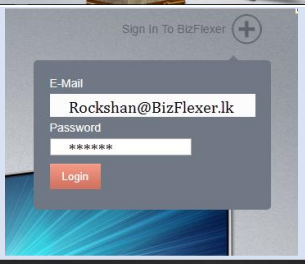
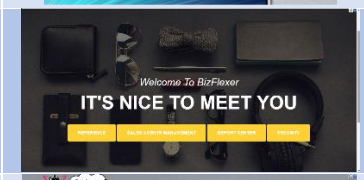
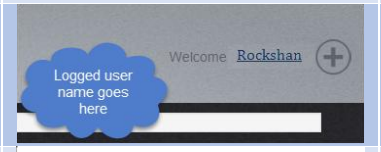
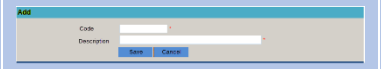
Sales Summary
No:478,
Nuwara-Eliya Road,
Pussellawa

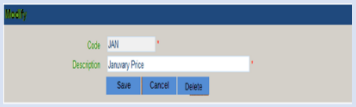
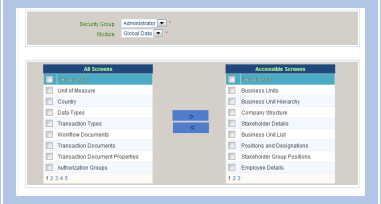
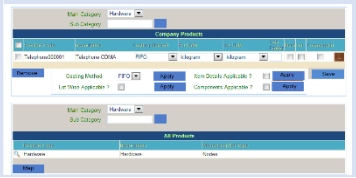
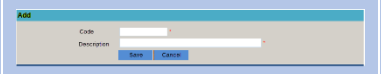
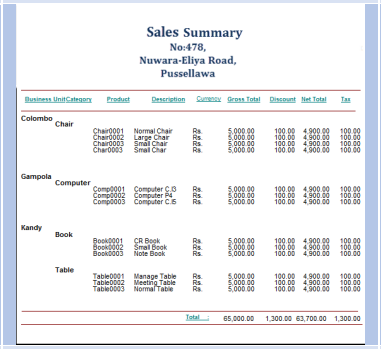
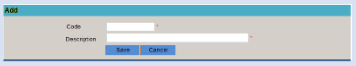
Business Unit	Category	Product	Description	Currency	Gross Total	Discount	Net Total	Tax
Colombo	Chair							
		Chair0001	Normal Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Chair0002	Large Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Chair0003	Small Chair	Rs.	5,000.00	100.00	4,900.00	100.00
		Char0003	Small Char	Rs.	5,000.00	100.00	4,900.00	100.00
Gampola	Computer							
		Comp0001	Computer C.I3	Rs.	5,000.00	100.00	4,900.00	100.00
		Comp0002	Computer P4	Rs.	5,000.00	100.00	4,900.00	100.00
		Comp0003	Computer C.I5	Rs.	5,000.00	100.00	4,900.00	100.00
Kandy	Book							
		Book0001	CR Book	Rs.	5,000.00	100.00	4,900.00	100.00
		Book0002	Small Book	Rs.	5,000.00	100.00	4,900.00	100.00
		Book0003	Note Book	Rs.	5,000.00	100.00	4,900.00	100.00
	Table							
		Table0001	Manage Table	Rs.	5,000.00	100.00	4,900.00	100.00
		Table0002	Meeting Table	Rs.	5,000.00	100.00	4,900.00	100.00
		Table0003	Normal Table	Rs.	5,000.00	100.00	4,900.00	100.00
				Total :	65,000.00	1,300.00	63,700.00	1,300.00

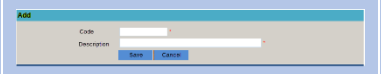
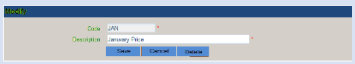
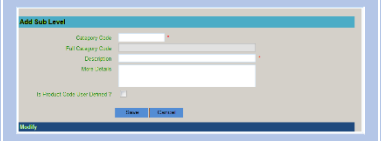
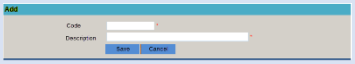
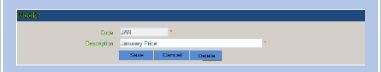
Figure D.5.: Management Reports-Sales Summary Report

Appendix E: Test Results

Test Cases

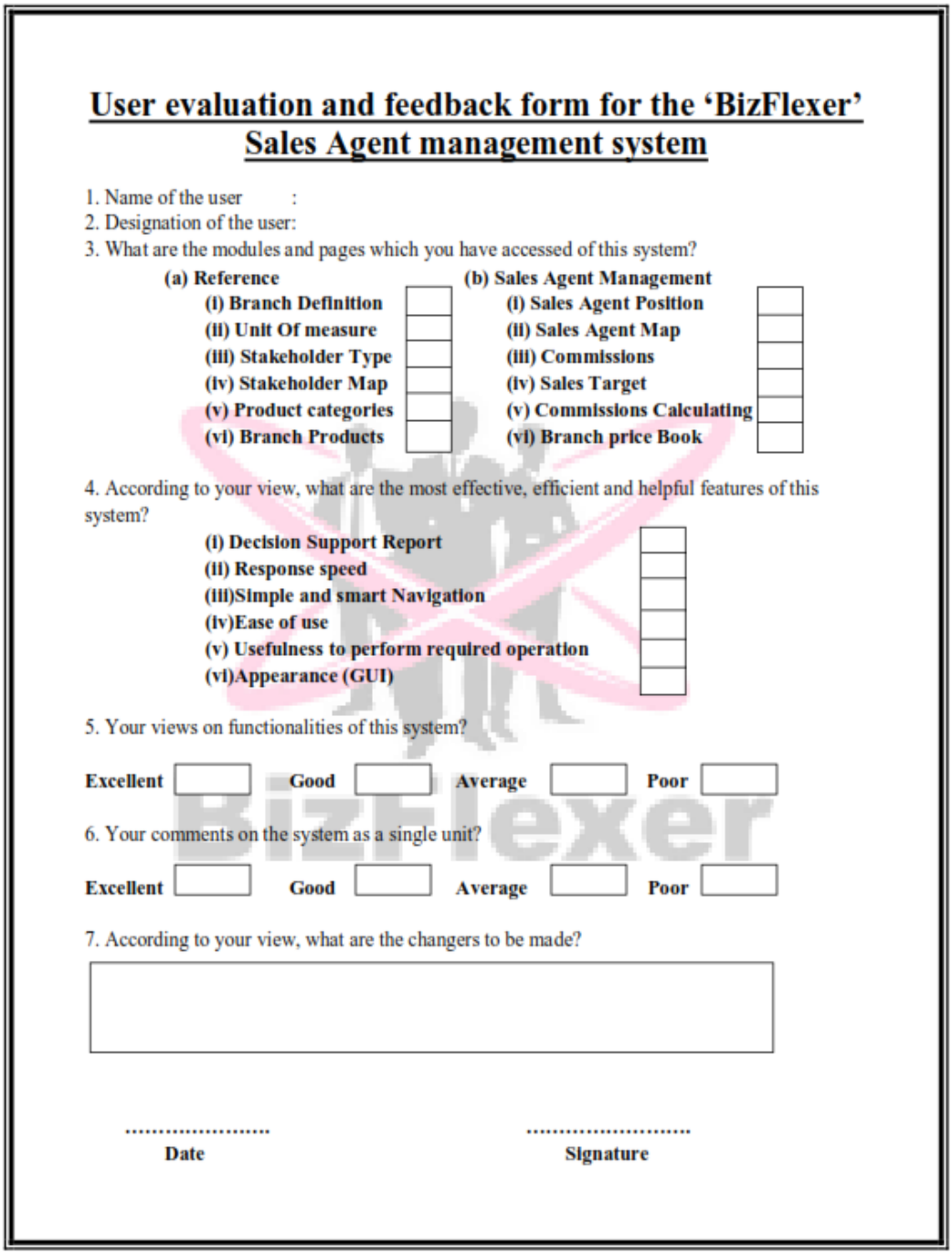
ID	Test Case	Expected Output	Actual Output	Status
01	Welcome Page	Load Welcome Page with relevant components		Pass
02	Login Modal	Load Login Modal with relevant components		Pass
03	Home Page	Load Home Page with enabled module navigation components		Pass
04	Navigation Panel	Load user relevant menu		Pass
05	Branch selector	Load relevant items	Load relevant items	Pass
06	Site Map	Show current location		Pass
07	User status	Show current user name		Pass
08	Invoice Report	Load Invoice Report		Pass
09	Branch Definition- Add Branch Definition	Load Add Branch Definitions		Pass

10	Branch Definition- Modify Branch Definition	Load Modify Branch Definitions		Pass
11	Screen Permission	Load Screen Permission		Pass
12	Define security groups	Load Define security groups		Pass
13	Branch Definition- Modify Unit of measure types	Load Modify Unit of measure types		Pass
14	Company product	Load Unit of measure		Pass
15	Branch Definition- Add Unit of measure	Load Add Unit of measure		Pass
16	Branch Definition- Modify Unit of measure	Load Modify Unit of measure		Pass
17	Report Sales summary	Load Sales summary report		Pass
18	Reference Data - Currency	Load Add Currency data		Pass
19	Reference Data - Currency	Load Modify Currency data		Pass

20	Commissions	Load Commissions Slabs		Pass
21	Stakeholder Management – Stakeholder Types	Load Add Stakeholder Types data		Pass
22	Stakeholder Management – Stakeholder Types	Load Modify Stakeholder Types data		Pass
22	Product Category	Load Product Category		Pass
23	Stakeholder Management –Stakeholder Details	Load Add Stakeholder Details		Pass
24	Stakeholder Management –Stakeholder Details	Load Modify Stakeholder Details		Pass

User Acceptance Testing

The ***Figure E.1.: UAF Document of Managing Director***, ***Figure E.2.: UAF Document of Operator*** and ***Figure E.3.: UAF Document of a Customer*** is a sample that used to acquire system evaluation and feedback



User evaluation and feedback form for the 'BizFlexer' Sales Agent management system

1. Name of the user :
2. Designation of the user:
3. What are the modules and pages which you have accessed of this system?

(a) Reference		(b) Sales Agent Management	
(i) Branch Definition	☐	(i) Sales Agent Position	☐
(ii) Unit Of measure	☐	(ii) Sales Agent Map	☐
(iii) Stakeholder Type	☐	(iii) Commissions	☐
(iv) Stakeholder Map	☐	(iv) Sales Target	☐
(v) Product categories	☐	(v) Commissions Calculating	☐
(vi) Branch Products	☐	(vi) Branch price Book	☐

4. According to your view, what are the most effective, efficient and helpful features of this system?

(i) Decision Support Report	☐
(ii) Response speed	☐
(iii)Simple and smart Navigation	☐
(iv)Ease of use	☐
(v) Usefulness to perform required operation	☐
(vi)Appearance (GUI)	☐

5. Your views on functionalities of this system?

Excellent ☐ Good ☐ Average ☐ Poor ☐

6. Your comments on the system as a single unit?

Excellent ☐ Good ☐ Average ☐ Poor ☐

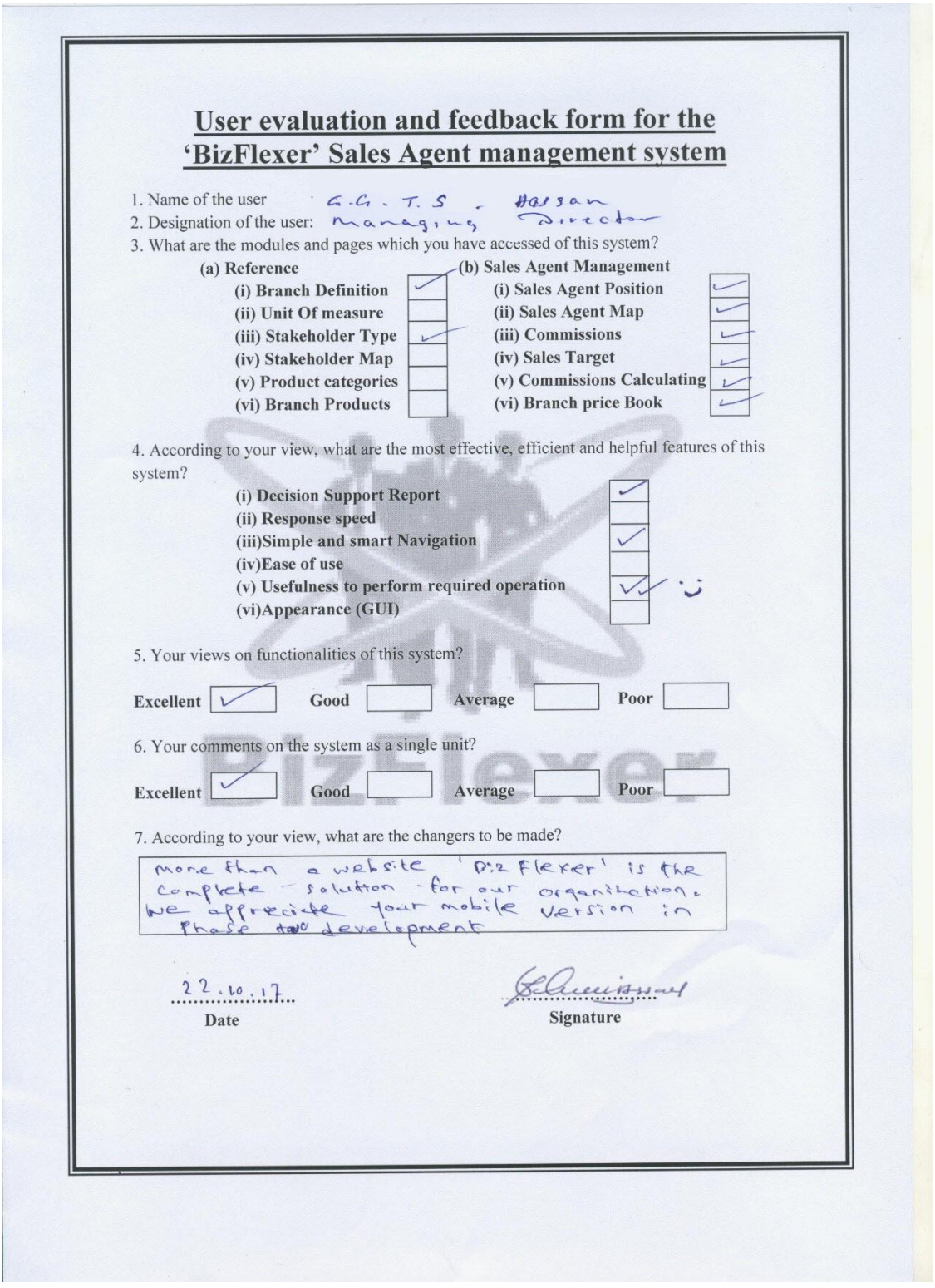
7. According to your view, what are the changers to be made?

☐

....

Date Signature

Figure E.1.: Sample user evaluation and Feedback Form



User evaluation and feedback form for the 'BizFlexer' Sales Agent management system

1. Name of the user G.G.T.S. Hassan
2. Designation of the user: Managing Director
3. What are the modules and pages which you have accessed of this system?

(a) Reference		(b) Sales Agent Management	
(i) Branch Definition	✓	(i) Sales Agent Position	✓
(ii) Unit Of measure		(ii) Sales Agent Map	✓
(iii) Stakeholder Type	✓	(iii) Commissions	✓
(iv) Stakeholder Map		(iv) Sales Target	✓
(v) Product categories		(v) Commissions Calculating	✓
(vi) Branch Products		(vi) Branch price Book	✓

4. According to your view, what are the most effective, efficient and helpful features of this system?

(i) Decision Support Report	✓
(ii) Response speed	
(iii)Simple and smart Navigation	✓
(iv)Ease of use	
(v) Usefulness to perform required operation	✓ ☺
(vi)Appearance (GUI)	

5. Your views on functionalities of this system?

Excellent [✓] Good [ ] Average [ ] Poor [ ]

6. Your comments on the system as a single unit?

Excellent [✓] Good [ ] Average [ ] Poor [ ]

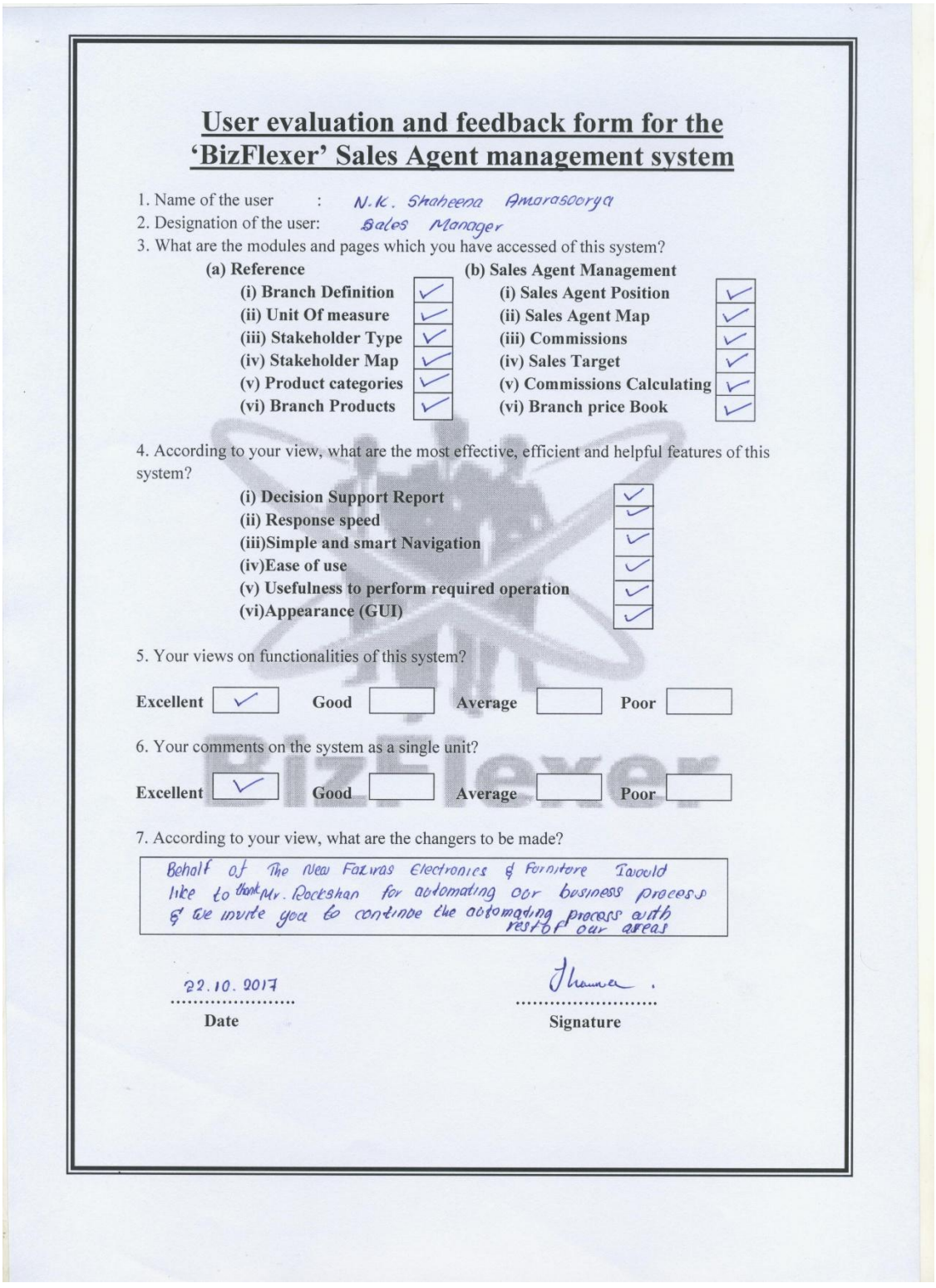
7. According to your view, what are the changers to be made?

more than a website 'Biz Flexer' is the complete solution for our organization. We appreciate your mobile version in phase two development

22.10.17
Date

Signature

Figure E.2.: User evaluation and Feedback Form Managing Director



User evaluation and feedback form for the 'BizFlexer' Sales Agent management system

1. Name of the user : N.K. Shaheena Amarasooriya
2. Designation of the user: Sales Manager
3. What are the modules and pages which you have accessed of this system?

(a) Reference		(b) Sales Agent Management	
(i) Branch Definition	✓	(i) Sales Agent Position	✓
(ii) Unit Of measure	✓	(ii) Sales Agent Map	✓
(iii) Stakeholder Type	✓	(iii) Commissions	✓
(iv) Stakeholder Map	✓	(iv) Sales Target	✓
(v) Product categories	✓	(v) Commissions Calculating	✓
(vi) Branch Products	✓	(vi) Branch price Book	✓

4. According to your view, what are the most effective, efficient and helpful features of this system?

(i) Decision Support Report	✓
(ii) Response speed	✓
(iii)Simple and smart Navigation	✓
(iv)Ease of use	✓
(v) Usefulness to perform required operation	✓
(vi)Appearance (GUI)	✓

5. Your views on functionalities of this system?

Excellent	Good	Average	Poor
✓			

6. Your comments on the system as a single unit?

Excellent	Good	Average	Poor
✓			

7. According to your view, what are the changers to be made?

Behalf of The New Faziras Electronics & Furniture I would like to thank Mr. Rockshan for automating our business process & we invite you to continue the automating process with rest of our areas

22.10.2017
.....
Date

.....
Signature

Figure E.3.: User evaluation and Feedback Form Sales Manager

Appendix F: Code Listings

[01].Web.config

This configuration xml file establish connection between 'BizFlexer' and its database between <connectionStrings> tags.

Important feature of this file is Ajax control tool kit which is main Reusable unit of this product.

```
<?xml version="1.0" encoding="utf-8"?>

<!-- Web configurations  with Ajax tool kit -->


<configuration>

  <system.web>

    <compilation debug="true" targetFramework="4.5.2" />

    <httpRuntime targetFramework="4.5.2" />

    <pages>

      <controls>

        <add tagPrefix="ajaxToolkit" assembly="AjaxControlToolkit"
namespace="AjaxControlToolkit" />

      </controls>

    </pages>

  </system.web>

<connectionStrings>

    <add name="BizFlexerDBEntities"
connectionString="metadata=res://*/Connection.BzFlexerDBModel.csdl|res://*/Conne
ction.BzFlexerDBModel.ssdl|res://*/Connection.BzFlexerDBModel.msl;provider=Syst
em.Data.SqlClient;provider connection string=&amp;quot;data source=DESKTOP-
TBROLHC\sqlexpress;initial catalog=BizFlexerDB;user
id=sa;password=sa@123;MultipleActiveResultSets=True;App=EntityFramework&amp;qu
ot;" providerName="System.Data.EntityClient" />

 </connectionStrings>

<system.codedom>

    <compilers>

      <compiler language="c#;cs;csharp" extension=".cs"
type="Microsoft.CodeDom.Providers.DotNetCompilerPlatform.CSharpCodeProvider,
```

```
Microsoft.CodeDom.Providers.DotNetCompilerPlatform, Version=1.0.0.0,
Culture=neutral, PublicKeyToken=31bf3856ad364e35" warningLevel="4"
compilerOptions="/langversion:6 /nowarn:1659;1699;1701" />

    <compiler language="vb;vbs;visualbasic;vbscript" extension=".vb"
type="Microsoft.CodeDom.Providers.DotNetCompilerPlatform.VBCodeProvider,
Microsoft.CodeDom.Providers.DotNetCompilerPlatform, Version=1.0.0.0,
Culture=neutral, PublicKeyToken=31bf3856ad364e35" warningLevel="4"
compilerOptions="/langversion:14 /nowarn:41008
/define:_MYTYPE=\&quot;Web\&quot; /optionInfer+" />

  </compilers>

 </system.codedom>

</configuration>
```

[02].Branch Product Form

Under agent Management we used these type of codes to accomplish operations and it depict how the section was handling work in development environment. For an example it was a region used in this code and it enhanced the code maintaining power.

```
using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Data.Objects.DataClasses;

using BzFlexer.SAMS.Biz.AgentManagement ;


namespace BzFlexer.SAMS.Biz.Reference

{


  public class Biz_Product

  {

    #region "BizProduct Properties"

    public long Id { get; set; }
```

```
public long IdProductCategory { get; set; }
public long IdSubProductCategory { get; set; }
public long IdUnitOfMeasureType { get; set; }
public string Code { get; set; }
public string Description { get; set; }
public string More_Details { get; set; }
public System.DateTime DateCreated { get; set; }
public System.DateTime DateModified { get; set; }
#endregion
#region"Reference Properties"
public Biz_ProductCategory Biz_ProductCategories
{
   get;
   set;
}

public Biz_SubProductCategory Biz_SubProductCategories
{
   get;
   set;
}

public Biz_UnitOfMeasureType Biz_UnitOfMeasureTypes
{
   get;
   set;
}
```

```
public EntityCollection<Biz_BranchProduct> Biz_BranchProducts
{
   get;
   set;
}

public EntityCollection<Biz_SalesForecastDetail> Biz_SalesForecastDetails
{
   get;
   set;
}

public EntityCollection<Biz_PriceBookDetail> Biz_PriceBookDetails
{
   get;
   set;
}

public EntityCollection<Biz_SalesBudgetDetail> Biz_SalesBudgetDetails
{
   get;
   set;
}

public EntityCollection<Biz_InventoryItem> Biz_InventoryItems
{
```

```
            get;

            set;

        }



    #endregion

  }

}
```

[02].Branch Product Form (aspx)

This code depict how the code indented in source coding and that was very helped for a success construction phase.

```
<%@ Page Title="" Language="C#" MasterPageFile="~/Reference/ReferenceHome.master" AutoEventWireup="true" CodeBehind="BzFlexerProductDetails.aspx.cs" Inherits="BzFlexer.SAMS.WebView.Reference.BzFlexerProductDetails" %>

<%@ Register Src="~/BoostUnit/ValidationText.ascx" TagName="FlashText" TagPrefix="Biz" %>
<%@ Register Assembly="AjaxControlToolkit" Namespace="AjaxControlToolkit" TagPrefix="cc1" %>
<asp:Content ID="Content3" ContentPlaceHolderID="ContentPlaceHolder1" runat="server">
  <div class="formtitle">
    <asp:Label ID="labelFormTitle" runat="server" Text="Product Details"></asp:Label>
  </div>
  <fieldset>
    <div class="formfield">
      <asp:Label ID="labelProductCategory" runat="server" Text="Product Category" CssClass="legendlabel_size2"></asp:Label>
      <asp:DropDownList ID="dropDownListProductCategory" runat="server" CssClass="select"
        Width="30%">
      </asp:DropDownList>
    </div>
  </fieldset>
  <br />
  <fieldset>
```

```
      <ul class="form">
         <li>
            <div class="gridfield">
               <asp:GridView ID="gridViewProductDetail" runat="server"
Caption="Product Details"
                  CssClass="ColStyle" EmptyDataText="No data to display"
AllowPaging="True" PageSize="10"
                  Width="99.6%">
                  <RowStyle CssClass="RowStyle" />
                  <AlternatingRowStyle CssClass="AltRowStyle" />
                  <HeaderStyle CssClass="GridHeader" />
                  <SelectedRowStyle CssClass="SelectedRowStyle" />
                  <Columns>
                     <asp:CommandField ItemStyle-Width="20"
ShowSelectButton="True" ButtonType="Image"
                        SelectImageUrl="~/styles/images/select.png" />
                     <asp:BoundField DataField="code" HeaderText="Code" />
                     <asp:BoundField DataField="Description"
HeaderText="Description" />
                     <asp:TemplateField HeaderText="Value"></asp:TemplateField>
                     <%-- <asp:BoundField DataField="Value" HeaderText="Value" />--
%>
                  </Columns>
               </asp:GridView>
            </div>
         </li>
         <li>
            <br />
         </li>
      </ul>
   </fieldset>
</asp:Content>    }
```

Appendix G: Client Certification

New Faziras Electronics and Furniture

No. 478,
Nuwara Eliya Road, Pussellawa.
Phone: (+94) 81-2478212
Faziras212@yahoo.com

Project Examination Board,

University of Colombo School of Computing,

221/2A, Dharma Pala Mawatha,

Colombo 07.

Certification of 'BizFlexer' Automated Sales Agent Manager

According to a request made by Sathish Rockshan, a student of the Bachelor of Information Technology (External) Degree Program conducted by the University of Colombo School of Computing, UCSC Building Complex, 35, Reid Avenue, Colombo 7, was granted permission to convert the sales functions of the company into a web based system titled as 'BizFlexer' as his final year project.

I am happy to inform that the candidate has successfully completed the proposed solution by achieving the requirements of the organisation. The overall product has been evaluated by the company staff and it has been identified as the most suitable solution to manage sales agents of the company in an effective manner.

The New Faziras Electronics & Furniture would like to thank Mr Sathish Rockshan for this accomplishment while appreciating the effort that has been taken to automate the sales agents of the company. We wish him every success in all his future endeavours.

Yours sincerely,

Mr G.G.T.S. Hassan
Managing Director,
New Faziras Electronics & Furniture

NEW FAZIRAS ELECTRONIC & FURNITURE
No. 478, Nuwara Eliya Road, Pussellawa.
☎ 081 2478212, 077 642006

02.11.2017
.....
Date

NEW FAZIRAS • ELECTRONICS & • FURNITURE

Glossary

A

API
: A set of functions and procedures that allow the creation of applications which access the features or data of an operating system, application, or other service.

C

CSS
: A style sheet language used for describing the presentation of a document written in a markup language

E

EA
: Enterprise Architecture is a conceptual blueprint

G

GUI
: Graphical User Interface help users to interact with electronic devices

H

HTML
: Hypertext Markup Language a standardized system for tagging text files to achieve graphical effects on World Wide Web pages

HTTP
: Hypertext Transfer Protocol is an underlying protocol used by the WWW

I

IDE
: Integrated Development Environment is consolidates the basic tools for developers.

N

N-tier architecture
: Architecture that different functions are physically separated

P

PDA
: Personnel Digital Assistant personal is an organizer that provides email and Internet access.

R

RUP
: Rational Unified Process divides the development process into four distinct phases.

S

SDLC
: Software Development Life Cycle

SQL
: Structured Query Language is used to communicate with a database.

U

UAT
: User Acceptance Testing allow user to make sure it can handle required tasks

UML
: Unified Modeling Language is a standardized modeling language.

X

XML
: Extendible Markup Language is a met language that allows to display documents on the Internet.

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