DEVELOPMENT OF A WIMAX CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM

By

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POST GRADUATE DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY

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This project report titled "Development of a WiMAX Customer Relationship Management System" submitted by Md. Shah Newaz, Roll No.: 1008311051, Session October, 2008 has been accepted as satisfactory in partial fulfillment of the requirements for the post graduate diploma in ICT held on 30th March, 2013.

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It is hereby declare that this project report or any part of it has not been submitted elsewhere for the award or any degree or diploma.

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Md. Shah Newaz

Dedicated

To

My Dear Parents

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List of Abbreviation

WIMAX	Worldwide Interoperability for Microwave Access
CRM	Customer Relationship Management
CIF	Customer Information Form
DBMS	Database Management System
TCP	Transmission Control Protocol
IP	Internet Protocol
HTTP	Hypertext Transfer Protocol
IT	Information Technology
PHP	Microsoft Preprocessor
SQL	Structured Query Language

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It is a matter of pleasure to have the opportunity to present this report titled "Development of a Wimax Customer Relationship Management System" submitted by Md. Shah Newaz, Roll No: 1008311051, Session: October, 2008 has been accepted as satisfactory in partial fulfillment of the requirements for the post graduate diploma in Information and Communication Technology under the Institute of Information and Communication Technology (IICT), Bangladesh University of Engineering Technology (BUET).

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ABSTRACT

WiMAX Customer Relationship Management (CRM) is a disciplined business strategy to create and sustain long-term, profitable customer relationships. Many Internet service providing companies pursue CRM in order to streamline or automate customer-facing business processes. CRM system is about being quicker, better, and more responsive to their customers need. As a consequence WiMAX CRM is a database system that makes bridge between the customer and the service providing organization. So to manage a large scale of customer service provider's requires a complete customer database system. In this project, the database is designed systematically to accommodate and satisfy the requirements of the company. This project is an application software that can be used for both customer and the service providing organization to view and update information by using user interface and administrator interface. The customer can easily use this software to recharge their account and also view and update their profile by using of user interface. On the other hand the administrators of the organization can easily serve their customer through this database software. The main objective of the service providing organization is to store customer database and to solve their daily problems which is perfectly organized in this database project. The concepts and ideas of this project may be replicated in other similar companies to manage their services and customers effectively.

CHAPTER - I

Introduction

1.1 Introduction

Customer Relationship Management (CRM) System is a modern database management system that are using in every sectors of customer related organization to store their customer's demography electronically.

The service providing organigation needs a way which is easy to access, able to store huge number of information that helps to monitor and provide better service to their customers [1, 2]. WiMAX CRM system is a system for the administrator to manage their customers and for the customers to interact with the service providing organization. WiMAX CRM system provides complete customer database, their billing system and serves the customer by customer care service. For customer database system WiMAX CRM System uses the modern database management system and customers can also pay their payments through the user interface of it [3]. Customers have different kinds of activities, such as buying bandwidth and modems which require after sell services [4, 5]. Service provider of the organization solves customer's daily problems that they face, such as authentication problem, bandwidth problem, faulty modem replacement etc., through WiMAX CRM System. The service provider offers different packages for Internet bandwidth. Moreover, a customer can pay his/her bill in prepaid or postpaid mode [6]. Therefore a customer is classified in different categories depending upon his/her bandwidth requirement and payment mode. The WiMAX CRM System keeps all information of a customer and it also helps a customer to migrate his/her packages from the current bandwidth and payment mode to another bandwidth and payment mode [7,8]. If a customer needs high bandwidth for a small duration of time, for example for doing video conference, then the proposed WiMAX CRM System can serve the customer after getting prior notice.

1.2 Motivation

Worldwide Interoperability for Microwave Access (WiMAX) is the wireless broadband Internet service is now spreading rapidly in our country and provides

Internet packages to their customer. Hence to serve their customer, the service providing organization needs a way which is easy to store customer's information that helps to achieve their customer's satisfaction by providing better service.

WiMAX CRM is a system design for the service providing organigation to manage their customer. Customer has different kind of activities such as buying bandwidth and modems which require after sell service [9]. So a large scale of customer should be served by the service providing organigation according to their system. WiMAX CRM is one of the database systems that makes a relationship among the customer and helps service providing organization to achieve their objective [10].

As a new customer needs to include into the system hence old customer needs to update that is to update location, present address, package migration, modem replacement etc. For serving and up to date their valuable customer the service provider of the organigation also serves customers daily problems that they face, such as authentication problem, bandwidth problem, faulty modem replacement etc., through WiMAX CRM System.

1.3 Objective

Customers can be classified in different categories, but the main goal of service providing organization is to increase customer satisfaction with a better support and more targeted products and to reduce costs. Every company should assemble a complete customer profile that allows users to see all demographic data, interactions, communications, and purchases made. WiMAX CRM system has the following objectives:

1. To store and update WiMAX customer information by using modern database management system.
2. To provide payment system such as billing summery, billing details, dues status etc. of WiMAX customers.
3. To provide and solve a customer's problem by the service provider through the introduction of a Ticketing System.
4. To give the opportunity to a business customer for using occasional high bandwidth.

1.4 Possible Outcome

The following outcomes are possible from WiMAX Customer Relationship Database Management System:

1. Any WiMAX Service providing organigation which can use the software to keep records of their customers.
2. Service provider can have access within a network.
3. Administrator will be able to log into the system using given password.
4. Administrator will be able to create a range number of prepaid card.
5. In this database management software, service provider will be able to
    1) Keep records of the customer information
    2) Add, edit, view, update and delete of the customer information
    3) Serve customer through WiMAX customer care service.
6. User will be able to
    1) Authenticate their account by using given user ID and password.
    2) View the package information and update their personal information.
    3) Recharge their account and change the password also.

1.5 Organization of the Project Report

1. Chapter 1 describes the overview and objectives of the project.
2. Chapter 2 describes about the project database management system, Concept of Information Modeling and Procedures.
3. Chapter 3 describes the methodology to develop the project. It includes the features of the system.
4. Chapter 4 describes the data collection and working procedures of WiMAX Customer Relationship Management System.
5. Chapter 5 describes the Software and Hardware interface of the database management system and also describes the basic design of the database software
6. Chapter 6 finally, describes the conclusion and recommendations for future works of the system.

CHAPTER - II

Database Management System

2.1 Database

Database systems are design to manage large bodies of information. Management of data involves both defining structures for storage of information and proving mechanisms for the manipulation of information. In addition, the database system must ensure the safety of the information stored, despite system crashes attempts to unauthorized access. If data are to be shared among several users, the system must avoid possible anomalies result.

2.2 Definition of Database

A database management system (DBMS) is a collection of interrelated data and a set if program to access those data the collection of data, usually refer to as the database, containing information relevant to an enterprise. The primary goal of a database is to provide a way to store and retrieve database information that is both convenient and efficient.

2.3 Types of Database

There are two types of database:

i. Desktop Based
   - Standalone
   - Network Support

ii. Web Based

2.4 Database System versus File System

The typical file system is supported by a conventional operating system. The system stores permanent record in various files and it needs different application programs to extract records from it and add records to the application file. Before database

management system came along, organization usually stored information/data in such system.

Keeping data/information in file processing system has number of major disadvantages:

1. Data redundancy and inconsistency
2. Difficult in data access
3. Data isolation
4. Integrity problem
5. Atomicity problem
6. Concurrent access anomalies
7. Security problem

2.5 Procedures of Database

There are various procedures for database Design. Some of the database procedures are shown below:

1. Create Database Tables
2. Normalization
3. Relationship
4. Implement with Oracle/MySQL
5. Coding
6. Debugging and Testing
7. Database level Modification
8. Finalization
9. Implementation

2.6 Information Modeling

Whenever understanding of a real world phenomenon or interaction desired the first step is to build a simple model representing the phenomenon and perform study and evaluation of the model rather than actual interaction. In building model the ambiguity and complexity in the real world is avoided totally or compensated with valid approximation. In fact a systematic study of any phenomenon whether economic, industrial or scientific is done through modeling. Information modeling pertains to development of model in information generation, storage, destruction, evaluation, manipulation, synthesis and utilizations. These models help in systematization of information generation, flow, interpretation synthesis of more information.

2.7 Concept of Information Modeling

The first step of information modeling is to precisely choose that part of reality, which is of interest. This is known as Entity. Entity defines other parameter. Entities are atomic that is they are invisible. The parameters if as entity are known as attributes. Attributes are known as quantum of information, which describe the entity entirely.

The second step in information modeling is relationship among entities. It is most important in making sense if the entity and inter-entity relationship. The relationship is the information, which links two entities. The relationship can be of four categories:

1. One-to-One (1:1) – One instance of the first entity can correspond to only one instance of the second entity. It is known as binary relationship.

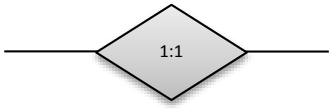


Fig-2.1: One-to-One Relation

2. One-to-Many (1:M) – One instance of the first entity can correspond to more than one of the second entity.

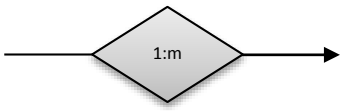


Fig-2.2: One-to-Many Relation

3. Many-to-One (M:1) – More than one instance of the first entity can corresponds to the same one instance of the second entity

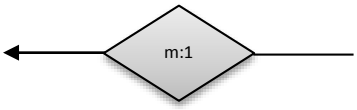


Fig-2.3: Many-to-One Relation

4. Many-to-Many (M:M) – More than one instance of the first entity can correspond to more than one instance of the second entity.

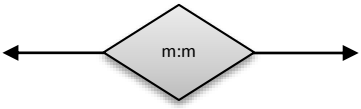


Fig-2.4: Many-to-Many Relation

2.8 Procedures for Information Modeling

The steps for Information modeling and rules of data normalization were described below:

1. The universe of discourse or the part if real world should be selected properly with minimum redundancy but completely in terms of entities.
2. Entities are to be classified according to their attributes contents and merged, which have One-to-One (1:1) Relationship into composite entities.
3. Their relationship among entities should be defined and named.
4. Normalization should be done to reduce redundancy and increase integrity.

2.9 Data Modeling

A data model is a model describing the data in an organization. It provides frame work for abstracting the essential qualities or characteristics of data. Data modeling is the process of abstracting and documentation using a data model.

Data modeling creates hierarchies of abstraction along two dimensions: aggregation and generalization. Aggregation identifies data item as arts of higher-level, more aggregate descriptor. Generalization creates categories into which a data item may be classified.

There are two major classes of data models – logical data models and physical data models. These two classes reflects the fact that efficient physical storage and retrieval of data must be designed around the physical characteristics if storage media and devices, but user of data should be able to describe, think about and use data without being concentrated about its physical storage.

2.10 Types of Data Modeling

The data modeling consists of three interrelated pieces of information, the data object, the attributes that describe the data object and the relationship that connect data objects to one another. A data object is a representation of almost any composite information that must be understood by software. Composite information means something that has a number of different properties or attributes.

Six different types of data models are given below:

1. Entity-Relationship Model (E-R Model)
2. Relational Model
3. Object-Oriented Data Model
4. Object-Relational data Model
5. Hierarchical Data Model
6. Network Data Model

2.11 Chapter Summary

This chapter presents about the database model, organigation of the database, aggregation and generalization, different types of data modeling. There are various type of relationship that is one to one, one to many, many to one and many to many are also described and represent them graphically.

CHAPTER - III
Methodology

3.1 Methodology

Methodology of study portraits the way how to study is being completed. An organized methodology is the guidelines for successful completion of study. Following methodology is being used to complete this project.

3.2 Selection of the Project

In recent years many organizations have identified the need to become more customers facing with increased global competition. As a consequence, WiMAX CRM system has risen to the agenda of many organizational strategies.

3.3 Collection of Information for Developing Database

Customer is the main resource in WiMAX CRM system. Information such as Name, ID, Address, Email, Phone etc. that should be implementing to the database system. Every raw data have been captured and stored in a file for further analysis.

The workflow diagram of the WiMAX CRM system is given next page:

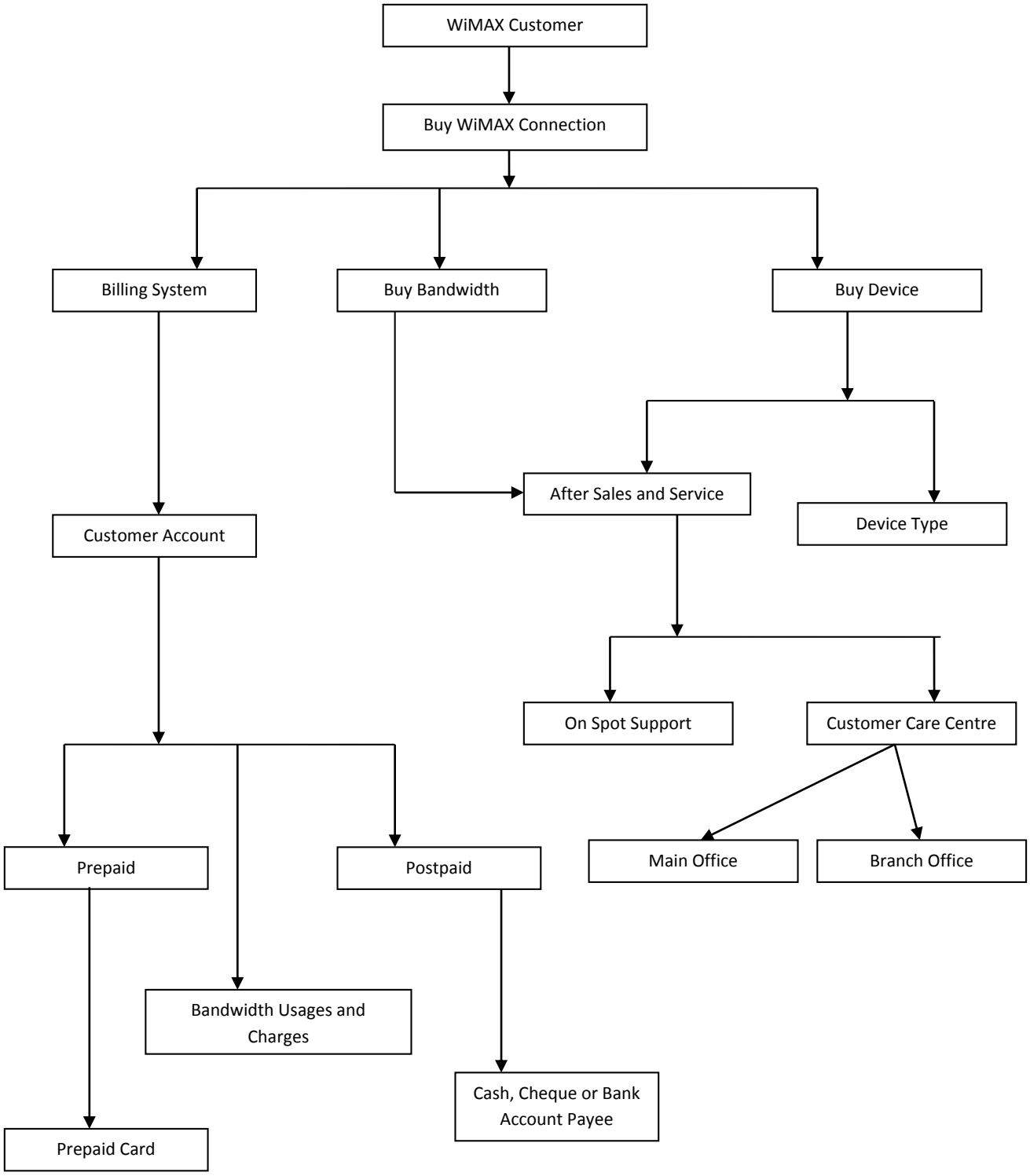


Fig-3.1: Work Flow Diagram of WiMAX CRM

3.4 Database Development

Relational database management system was used to manage the database. The database was developed in MySQL in eighteen tables. The total data have been normalized and then tables are obtained.

3.5 Description of the Database Development

For simplicity, twenty tables have been Designed namely customerinfo, customerpackeges, customerarea, customercategory, customerstatus, card, card_customer, packegeinfo, wimaxinfo, billinginformation, billingdetails, billingsummery, paymentmethod, staffinfo, department, help_topic, ticket, ticket_message. Brief description of the tables is given below:

1. **Customer Information Table:** This table contain eight columns (customer_id, name, addrsline1, addrsline2, phone, mobile, email, Security_amount) holding values for Customer ID, Customer Name, Address line 1, Address line 2, Customer Contact number, Mobile number, E-mail address and Security amount.
   customer_id –Auto Number
   name – Text
   addrsline1 – Varchar
   addrsline2 – Varchar
   phone – Integer
   mobile – Integer
   email – Varchar
   Security_amount – Integer
2. **Customer Packages Table:** It has three columns (packege_id, customer_id, registration_date).
   packege_id – Auto Number
   customer_id – Auto Number
   registration_date – Date
3. **Customer Area Table:** Area table has six columns (area_id, customer_id, zone_name, area_name, coverage_sqkm, completion_date).

area_id – Auto Number

customer_id – Auto Number

zone_name – Text

area_name – Text

coverage_sqkm – Integer

completion_date – Date

4. **Customer Category Table:** It has four columns (category_id, customer_id, category_name, priority_level).

   category_id – Auto Number

   customer_id – Auto Number

   category_name – Text

   priority_level – Text

5. **Customer Status Table:** It has five columns (customer_id, status, start_date, end_date, future_inactivedate).

   customer_id – Auto Number

   status – Text

   start_date – Date

   end_date – Date

   future_inactivedate – Date

6. **Package Information Table:** It has eight columns (packege_id, packeg_name, device_name, bandwidth, cost, packeg_starttime, packeg_endtime, security_amount).

   packege_id – Auto Number

   packeg_name – Text

   device_name – Text

   bandwidth – Varchar

   cost – Varchar

   packeg_starttime – Time

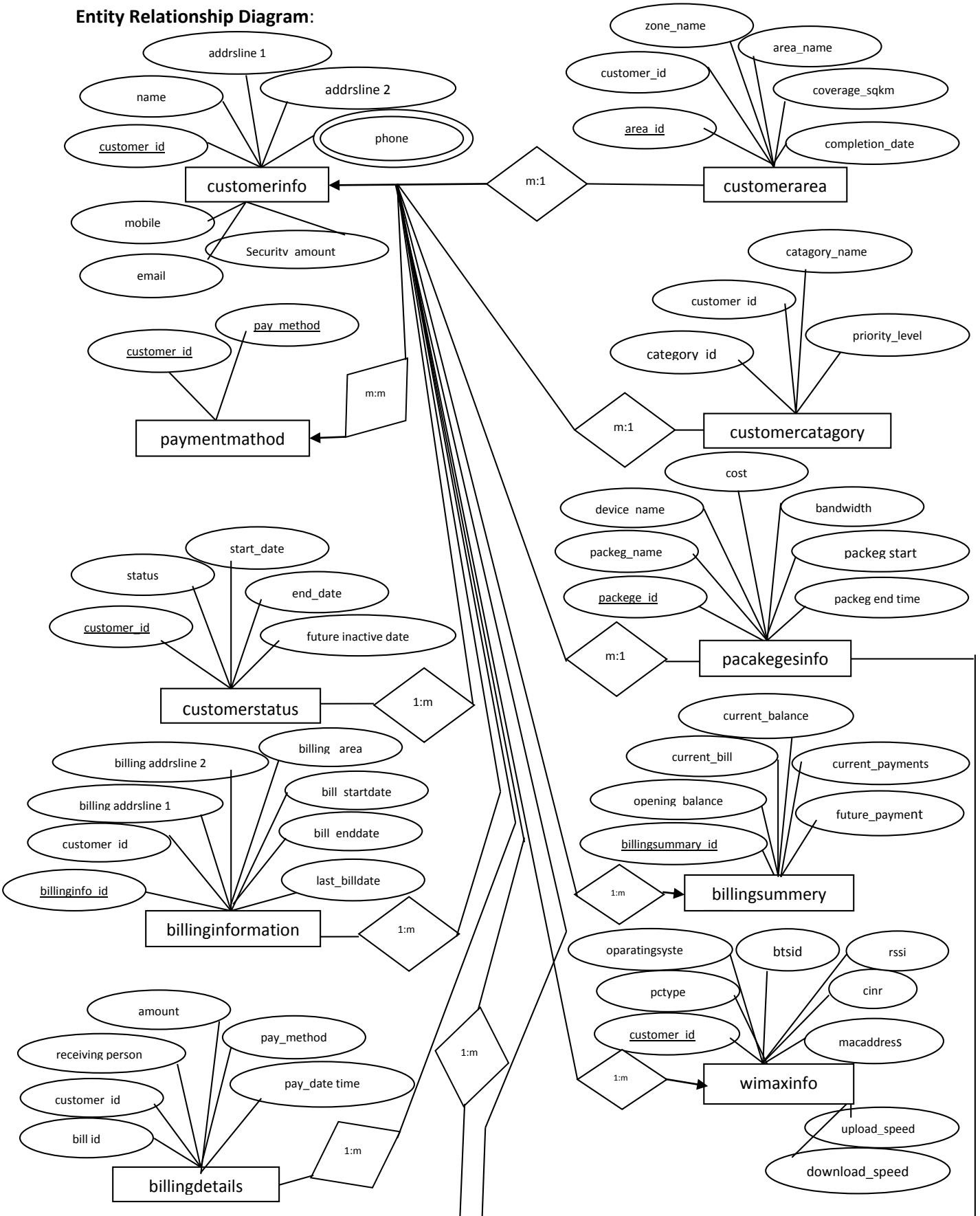
   packeg_endtime – Time

   security_amount – Varchar

7. **Wimax Information Table:** It has ten columns (wimaxinfo_id, customer_id, pctype, operatingsystem, btsid, macaddress, rssi, cinr, download_speed, upload_speed).
8. **Payment Method Table:** It has two columns (customer_id pay_method).
9. **Billing Information Table:** It has eight columns (billinginfo_id, customer_id, billing_area, billing_addrsline1, billing_addrsline2, bill_startdate, bill_enddate, last_billdate).
10. **Billing Details Table:** It has six columns (bill_id, customer_id, receiving_person, amount, pay_method, pay_datetime).
11. **Billing Summery Table:** It has six columns (billingsummery_id, customer_id, opening_balance, current_bill, current_payments, future_payments).
12. **Staff Information Table:** It has eight columns (staff_id, name, location, presentaddress, permanentaddress, mobile, email, designation).
13. **Department Table:** It has two columns (department_id, department_name).
14. **Help Topic Table:** It has seven columns (topic_id, isactive, priority_id, department_name, topic, created, updated).
15. **Ticket Table:** It has nineteen columns (ticket_id, customer_id, department_id, priority_id, topic_id, staff_id, email, name, subject, helptopic, phone, status, duedate, reopened, closed, lastmessage, lastresponse, created, updated).
16. **Ticket Message Table:** It has seven columns (message_id, ticket_id, message, headers, source, created, updated).
17. **Card Table:** It has six columns (card_id, serialnumber, pinnumber, type, status, validperiod).
18. **Card Customer Table:** It has four columns (customer_id, card_id, rechargedate, usesvalidation).

3.6 Entity Relationship Diagram

Entity Relationship Diagram:



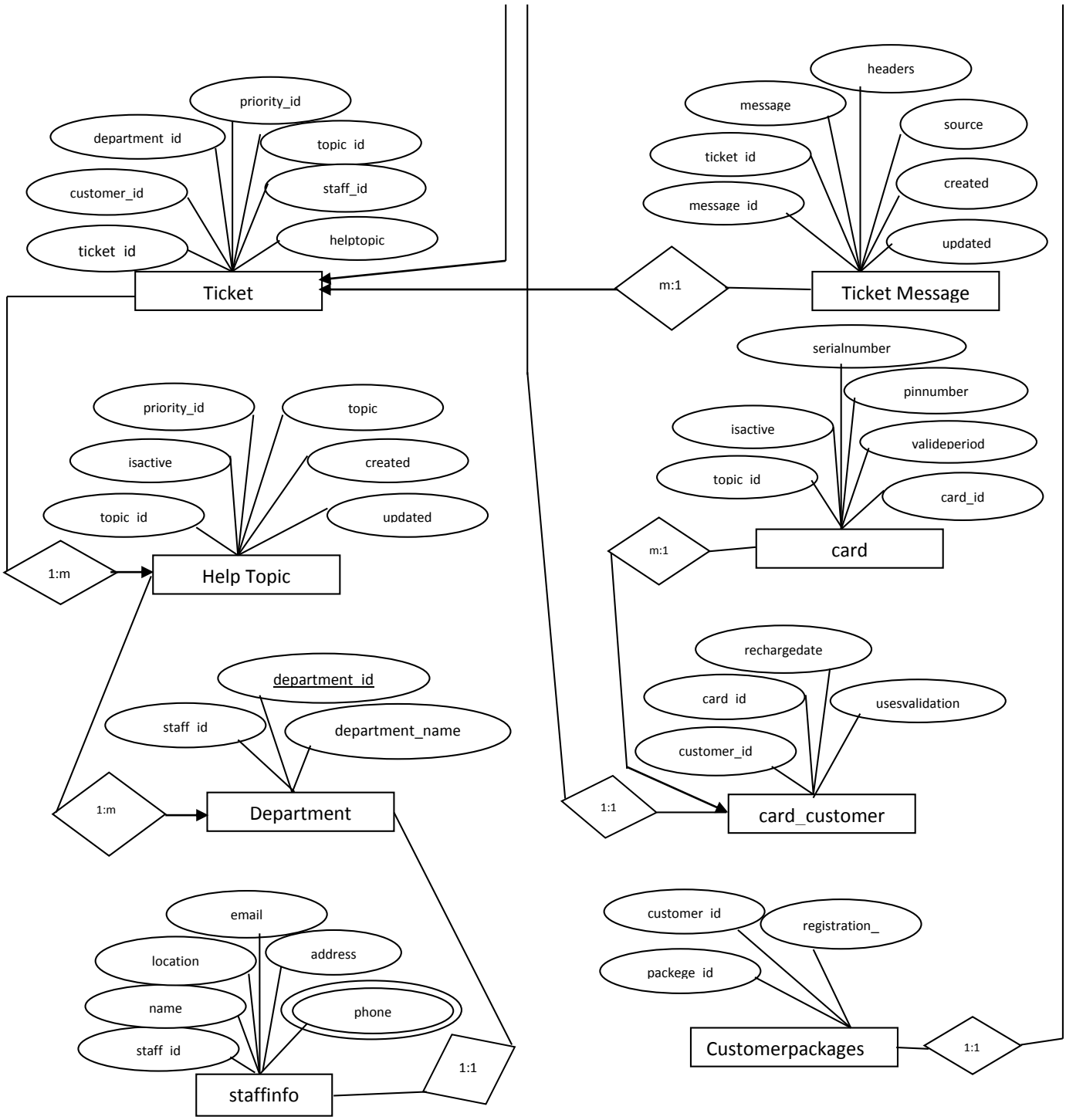


Fig-3.2: E-R Diagram of WiMAX CRM

3.7 Relationships

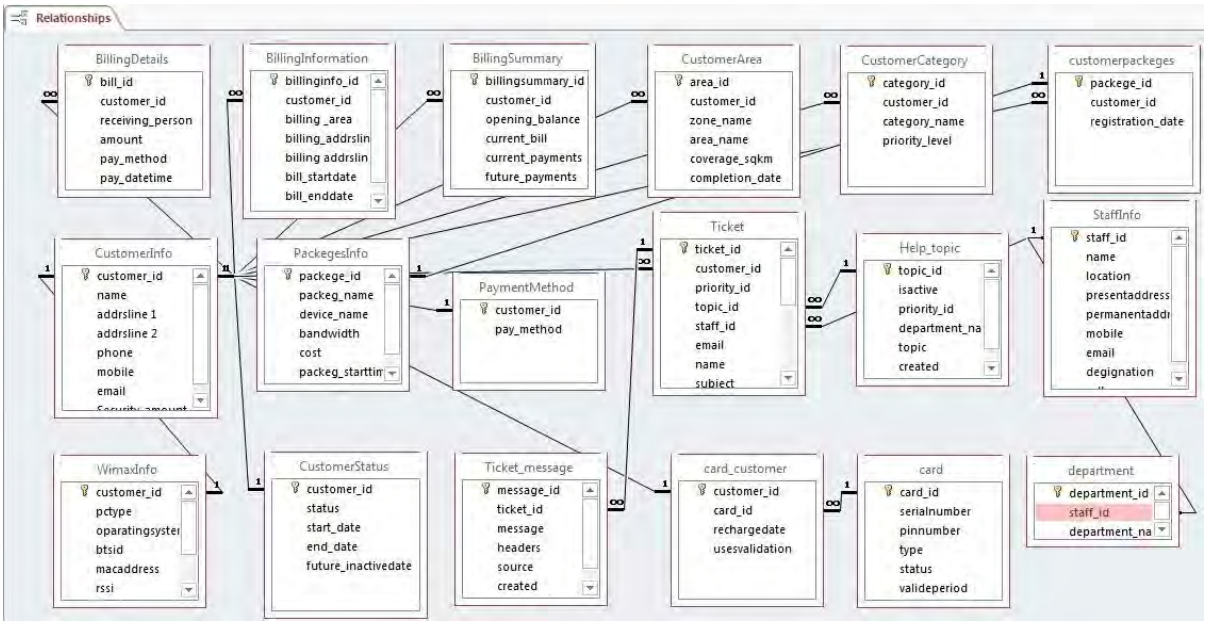


Fig-3.3: Relationship

3.8 Data used for the Development

Customer Information Table:

customer_id	name	addrsline1	addrsline2	phone	mobile	email	Security_amount	customer_lid	pass
1	Md. Shah Newaz	Dhanmondi, Dhaka	Do	02894268	01914920422	snz@gmail.com	3000 tk	wimax1	wimax1
2	Mr. Sonjoy	Mirpur, Dhaka	Do	-	01916143433	sanjoy@yahoo.com	3000 tk	Wimax2	Wimax2
3	Md. Arifur Rahman	Uttara, Dhaka	Do	02894395	01715185916	arif_r@hotmail.com	3000 tk	Wimax3	Wimax3

Customer Packages Table:

packege_id	customer_id	registration_date
1	1	2011-07-24
2	2	2011-02-10
3	3	2011-02-09

Customer Area Table:

area_id	customer_id	zone_name	area_name	coverage_sqkm	completion_date
1	1	Bonani	Bonani	1000 sqkm	2011-07-24
2	2	Dhanmondi	Kalabagan	2400 sqkm	2011-02-10
3	3	Mirpur	Mrpur-1	1500 sqkm	2011-02-09

Customer Category Table:

category_id	customer_id	category_name	priority_level
1	1	Corporate	High
2	2	Business	Medium
3	3	General	General User

Customer Status Table:

customer_id	status	start_date	end_date	future_inactivedate
1	Active	2010-07-24	2010-08-24	2011-08-24
2	Block	2010-02-10	2011-03-10	2012-03-10
3	Active	2010-02-09	2011-03-09	2012-03-09

Package Information Table:

packege_id	packeg_name	device_name	bandwidth	cost	packeg_starttime	packeg_endtime
1	256kbps_prepaid	Standard Modem	256 kbps	3500 tk	2011-03-10	-
2	256kbps_postpaid	Standard Modem	256 kbps	3500 tk	2011-03-10	-
3	512kbps_prepaid	Standard Modem	512 kbps	4000 tk	2011-03-10	-

Wimax Information Table:

wimax info_id	customer_id	pctype	operatingsystem	macaddress	btsid	cinr	rssi	download_speed	upload_speed
1	1	Laptop	Windows-7	00-1F-FB-0C-55-1D	00-1F-F0-23-61-3D	21	53	253 kbps	82 kbps
2	2	Laptop	Windows-XP	00-1F-FB-24-8H-5O	00-1F-49-2K-11-9P	30	60	257 kbps	61kbps
3	3	Desktop	Linux	00-1F-FB-7V-38-2l	00-1F-FB-4O-5A-4I	25	82	522 kbps	102 kbps

Payment Method Table:

customer_id	pay_method
1	Cash
2	Check
3	Account Payee

Billing Information Table:

billinginfo_id	customer_id	billing_area	billing_addrsline1	Billing_addrsline2	bill_startdate	bill_enddate	last_billdate
1	1	Mirpur	R-2, Mirpu, Dhakar	Do	2010-07-24	2010-08-24	2011-08-24
2	2	Dhanmondi	H-60, R-13/a, Dhanmondi, Dhaka	Do	2010-02-10	2011-03-10	2012-03-10
3	3	Banani	Banana, Dhaka	Do	2010-02-09	2011-03-09	2012-03-09

Billing Details Table:

bill_id	customer_id	amount	pay_method	pay_datetime
1	1	3500 tk	Cash	2010-08-24
2	2	3500 tk	Card	2011-03-10
3	3	4000 tk	Card	2011-03-09

Billing Summery Table:

billingsummery_id	customer_id	opening_balance	current_bill	current_payments	future_payments
1	1	3000 tk	1000 tk	1000 tk	2000 tk
2	2	3000 tk	2000 tk	2000 tk	1000 tk
3	3	4000 tk	1500 tk	1500 tk	2500 tk

Staff Information Table:

staff_id	name	location	presentaddress	permanentaddress	mobile	email	designation
1	Md. Sayem	Banani	Mirpur, Dhaka	Do	01914920422	sayem@gmail.com	Officer
2	Md. Rasel	Banani	Banani, Dhaka	Do	01916143433	rasel@yahoo.com	Support Officer
3	Md. Sanim	Banani	Kalabagan, Dhaka	Do	01715185916	snm@hotmail.com	Manager Marketing

Department Table:

department_id,	department_name
1	Sell Department
2	Marketing Department
3	Support Department

Help Topic Table:

topic_id	department	topic	created	updated
1	Help and Support	-	2010-07-24	-
2	Sels and Service	-	2010-02-10	-
3	Marketing	-	2010-02-09	-

Ticket Table:

ticket_id	customer_id	department	priority	name	email	phone	subject	staff name	status	created
1	1	Help and Support	High	Md. Shah Newaz	newaziictbuet@gmail.com	+880-1914920422	Custome Service & Support	Md. Reaz Uddin	Open	2011-08-02
2	2	Sels and Service	Medium	Shahriar Shehab Joy	shehab.joy@gmail.com	+880-29871347	Custome Service & Support	Md. kamal Hossain	close	2011-08-02
3	3	Marketing	High	Md. Khorshed Alam	khorshedalam@yahoo.com	+880-1814405200	Custome Service & Support	Md. Sarwar Shuvo	close	2012-10-25

Ticket Message Table:

message_id	ticket_id	message	source	created	updated
1	1	Connection Problem. Contact Name Md. Khorshed Alam(01814405200), 25th oct 2012.	Over Phone	2010-07-24	-
2	2	This Connection is Out of Range and needs to refund the modem immediately. Thanks	By Mail	2010-02-10	-
3	3	Bandwidth Problem.Contact Name Md. Rifat(01914949494),01 november 2012	Over Phone	2010-02-09	-

Card Table:

card_id	serialnumber	pinnumber	type	status	valideperiod
1	1	447f68	prepaid	UNUSED	2012-08-29
2	2	de80f3	prepaid	UNUSED	2012-08-29
3	3	3a1760	prepaid	UNUSED	2012-08-29

Card Customer Table:

customer_id	card_id	rechargedate	usesvalidation
1	1	2012-08-11	2012-09-11
2	2	2012-08-11	2012-09-11
3	3	2012-08-11	2012-09-11

3.9 Chapter Summary

This chapter presents the database development, creation of the database table, graphical representation of the entity relationships. This chapter introduce the step by step working procedure of WiMAX CRM system. We also learn about the collection of database table, normalization and also description of the attributes of the CRM database system.

CHAPTER - IV

Data Collection and Working Process

Working with step by step data manipulation is known as working procedure. There are some criteria to storing and updating of customer profile, payment system and customer care service by WiMAX Customer Relationship Management system. The working process is described below:

4.1 Collection and update Process of Basic Information

As customer buys a WiMAX connection, he/she have to maintain some official procedure. Customer has to fill up a Customer Information Form (CIF) which customer provides all of his information (name, address, phone number, email, bandwidth, device and so on). Customer also includes some other documents such as passport size photograph, photocopy of national ID card and sells receipts. A sample copy of Customer Information Form (CIF) is given to the next page:

Instructions:
1. Please fill in each box with one character and leave an empty box after each word.
2. Only use CAPITAL letters in English.
3. Passport size photographs, copy of money receipt and National ID should be attached.

35mm X 45mm
Borderless Color photo

1. Customer Name (English):
2. Father's Name (English):
3. Phone Number:
4. Present Address:
5. Permanent Address:
6. Email:
7. National ID No:
8. Connection Type:
   ☐ Prepaid ☐ Postpaid
9. Bandwidth:
   ☐ 256 kbps ☐ 512 kbps ☐ 1 MB ☐ 2 MB
10. Device Type:
    ☐ Wimax524m ☐ Wimax523m ☐ Wimax524r

11. Bandwidth Price: ……

12. Device Price: ……

13. Grand Total: ……

Sold by: …….

……
Customer Signature with date

Mobile Broadband Internet Service WiMAX bd Ltd.
Dhaka, Bangladesh.

Fig-4.1: Customer Information Form (CIF)

After successful completion of Customer Information Form (CIF), the administrator then receives CIF and updates their customer profile by filling up the required field of the WiMAX CRM system. If customer wants to update their own profile, which is also possible. For this, user has to authenticate their WiMAX connection first by user id and password. After that a user interface appears to the customer end and then user can able to edit or update their profile online.

4.2 Payment System

There are two type of WiMAX packages, postpaid and prepaid. Both postpaid and prepaid customer pays their payments according to the payment rules of the company. These two types of payment systems are described below:

1. **Prepaid customer:** Prepaid user recharges their account by WiMAX prepaid card. There are different rates of prepaid card. Every prepaid card has limited bandwidth for a period of time as 400 Tk prepaid card is valid for one month which has 1GB of usages limit and 700 Tk prepaid card is valid for one month but 2GB of usages limit. Customer has to collect prepaid card from WiMAX outlet for recharging purpose. After that login to the user interface and insert the serial number and pin number of the prepaid card then a confirmation message appear that the account is successfully recharge or not. For example, some of the prepaid cards are shown here-

Fig-4.2: 400 Tk prepaid card

Fig-4.3: 700 Tk prepaid card

2. **Postpaid Customer:** Postpaid customer has various type of payment system. First of all postpaid customer have to paid conditional security money at the

time of buying a WiMAX postpaid connection. Then follows the pair usages policies. Postpaid customers are notified about their bill through a sms or by an email. The WiMAX organization has a large number of outlets in the local area of the customer where the Internet service provider sell their WiMAX packages, modems, prepaid cards and also receive postpaid bill which is known as billing point. Postpaid user paid their cash payment through this specific billing point and administrator updates customer billing. Another process of postpaid bill payments system is banking transaction where postpaid user paid their bill in the specific bank account.

4.3 Customer Care Service

Customer faces various kinds of problems when they are using the WiMAX connection. Organization has many procedures to solve their problems. Customers are classified according to their category and serve them by the technical support team of the organization.

In this process user is recognized by the auto generated ticket number. For every user, this unique ticket number is generated with the help of WiMAX Customer Relationship Management database system software. When customer faces a problem, he/she may send a short message describing the problem to the official cell number. Then the admin people of the organization update the customer ticket number describing the problem and save it to their database system. This saved ticket number is identified as an open ticket until a proper solution made by technical support team. When the technical support team solves their customer problem then the ticket number is define as a close ticket.

Another process of customer service is customer care center. The outlets of the WiMAX organization playing an important role of customer care. Where user goes to the customer care center and describes their problems. Customer care people then provide service to the user's solving their problems and update the database system.

As customer is classified in different categories so they needs different bandwidth in different period of times. WiMAX Customer Relationship Management (WCRM) is a database system which allows this type of service instantly and more securely. Service provider also helps the customer to migrate their packages from the current bandwidth to another bandwidth and update their database. If any customer needs such a bandwidth which he can make a video conference for business or any other purpose that also serve by the service provider of customer care. This service is only for the postpaid customer and the user have to pay a fixed amount for every minute.

4.4 Chapter Summary

Service providing organigation needs customer information first to create customer database. That's why have to collect customer information form the customer end that the customer filled up the form at the time of buying WiMAX Connection. This chapter described about the payment system, their uses and also described about the customer care service.

CHAPTER - V

System Design

System design known as the graphical representation of the software. Software design is a process through which requirements are translated into a "blueprint" for constructing software. Initially the blueprint depicts a holistic view of software. That is, the design is represented at a high level of abstraction. The level that can be directly traced to the specific system objective, detailed data, functional and behavioral requirements.

5.1 Basic Design of the PC Software

The WiMAX administrator can manipulate data with the help of this software. It assists administrator to keep information of the Customer, their payment records and provides customer support with more comfortably, safely and securely. There are two interfaces of the CRM system which are described below:

1. **Administrator Interface:** The software is connected with company server database, thus no more connection with other systems is needed. No system interface is needed during the development of this project.
2. **User Interface:** The software shall be designed as a web based that has a main user interface. Format of main screen shall be standard and flexible. The system shall be user friendly. Pages shall be connected to each other in a consistent way. Operations to be done with the system shall be repeatable.

5.1.1 Hardware Requirement

There is no need any hardware interface for online Customer Relationship Management System.

5.1.2 Programming Language and Software Platform

Programming language is very much important because it helps to Design interface and run the application smoothly. The server and the language that used in this project is described below:

Software Interfaces:

1. Name: Microsoft Internet Explorer

Version number: 7, 8 or later

Source: Microsoft Corporation

Purpose: The web browser specified above is required in order to execute the user side of the software.

Definition of the Interface: The Microsoft Internet Explorer provides easier, faster, safer, flexible and reliable browsing experience with enhanced web privacy features for all users.

2. Name: Apache HTTP Server

Version number: 2.2.14

Source: The Apache Software Foundation

Purpose: The web server specified above is required as the provider of the client software at the server site.

Definition of the Interface: The Apache HTTP server project is a combined software development effort aimed at creating a strong, commercial-grade, featureful, and freely-available source code implementable with operating systems including UNIX and Windows NT.

3. Name: PHP

Version number: 5.3.1

Source: PHP Group.

Purpose: PHP is used for server-side web development PHP generally runs on a web server which work with MySQL database and Apache server.

Definition of the Interface: PHP is a mostly-used general-purpose scripting language that has improved object-oriented capabilities especially suited for web development and can be embedded into HTML.

4. Name: MySQL
Version number: 5.1.41
Source: MySQL.
Purpose: Required as relational database server.
Definition of the Interface: MySQL is the world's most popular and powerful open source relational database software, with over 100 million copies of its software downloaded or distributed throughout its history. With flexibility, superior speed, reliability, and ease of use, MySQL has become the preferred choice of corporate IT managers because it eliminates the major problems associated with downtime, maintenance, administration and support.

5. Name: Macromedia Dreamweaver MX
Version number: 8
Source: Macromedia Inc.
Purpose: The web development tool specified above is required for designing and coding of the software.
Definition of the Interface: Macromedia Dreamweaver is professional HTML editor tool, enabling users to efficiently design, coding, develop and maintain standards websites and applications.

5.1.3 Communication Interfaces

The default communication protocol for data transmission between server and the client is Transmission Control Protocol/ Internet Protocol (TCP/IP). At the upper level hypertext transfer protocol (HTTP) will be used for communication between the web server and client.

5.1.4 Memory Constrain

There is not a specific memory constraint for this software.

5.1.5 Software System Attributes

a) Reliability

The software must operate 100% of the time.

b) Security

The authorization mechanism of the system will block the unwanted attempts to the server and also let the system decide which privileges may the user should have. The system has different types of users so there are different levels of authorization. There will be also a firewall installed on the server so the incoming transactions can be filtered. Data integrity for critical variables will also be checked.

c) Maintainability

The requirements, modules that are explained in this document are enough to satisfy the project goal. So, the maintainability shall be easily done by the admin of the system.

d) Portability

This Software is an online service. So, anyone can use the service. Only the server of the system must have the required software including MySQL, Apache. The interface is designed with the help of PHP as it provides easy abstract window toolkit and used widely. PHP is an extremely rich programming language and it contains the basic components of developing user's interface. It is an integrated development environment in which we can develop, run, test and debug our application. The programmer can easily use the buildup tool kits for any application software. It has evolved into a major development environment that covers every aspects of programming, from education applications to database and from financial applications to Internet components. In future the platform independent Language Java can be used.

5.2 Architecture Overview

The basic functionality of the software involves the WiMAX Customer Relationship Management system over the Internet at a minimal cost. The fundamental requirement of the project is a web application built in Apache, MySQL and PHP. The basic architecture of web application is described below:

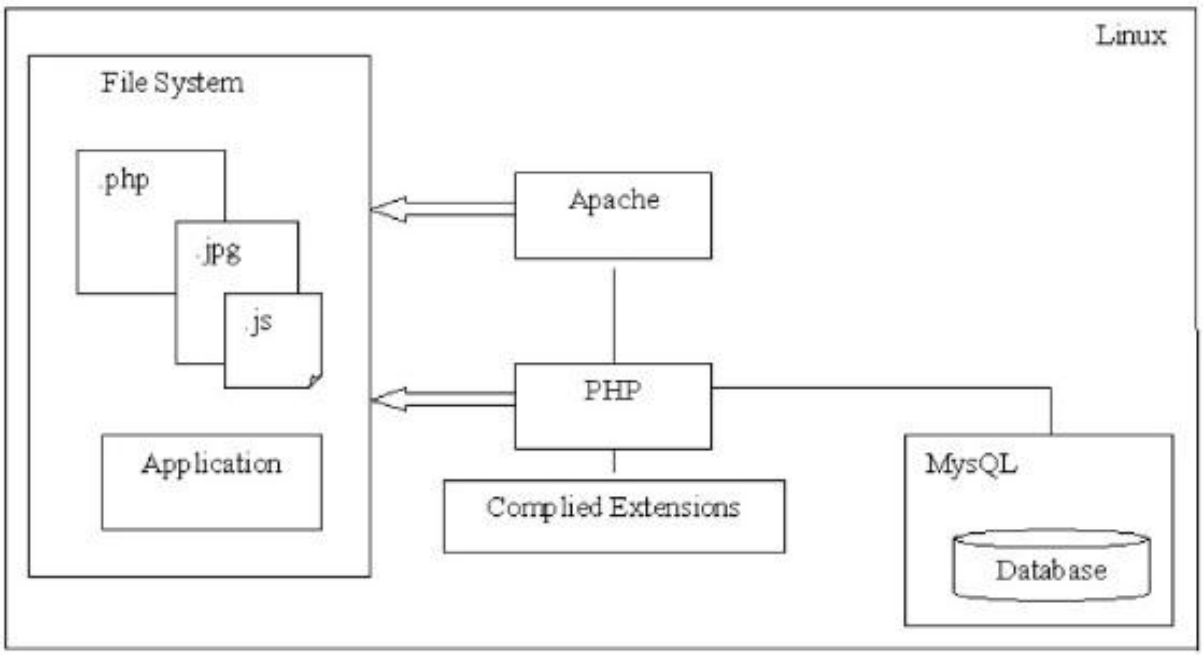


Fig. 5.1: Architecture of web application

5.2.1 The Client Side

A client, i.e. the computer, laptop, mobile etc. which requests the resources, through the internet with a user interface (typically a web browser) for presentation purposes.

5.2.2 The Admin Side

Admin also another client, i.e. the computer, laptop, mobile etc. which requests the resources, through the internet with a user interface (typically a web browser) for creating, updating and deleting information.

5.2.3 The Web Server

Almost all of the works of web application take place on the server. A specific application, called a web server, is responsible for authentication, authorization and secure communication channel with the browser. A relational-database server stores whatever information the application requires.

5.2.4 The Application Server/Middleware

The application server is also called middleware, whose assignment it is to provide the requested resources, but by calling on another server. PHP belongs to a class of languages known as middleware. These languages work closely with the Web server to interpret the requests made from the World Wide Web (WWW), process these requests, interact with other programs on the server to fulfil the requests, and then pass to the web server exactly what to serve to the client's browser.

5.2.5 Functional Requirement Analysis

Functional requirement defines a set of general requirements that can be identified as shown below. They are clustered into the following categories:

a) Network specific requirements

SL	Title	Description
01.	Server	System requires a streaming server

b) File and database management requirements

SL	Title	Description
01.	System allows for creation of profiles	User can view their demographic data and edit their personal information. Admin can modify customer database and the privilege to user access.
02.	User Authentication	User has the unique user ID and Password to authenticate their Connection.
03.	System file	System contains many file for storing information.
04.	Image file	Files can store image (e.g. .jpeg, .gif, etc) content on the user side and admin can view the image file.
05.	Save data	Stored information is clustered to categories
06.	Data available	Receive content from fixed/wireless public networks.

C) Query and retrieval requirements

SL	Title	Description
01.	User identification	System can select user (Customer, administrator)
02.	View user info	User can view his/her personal info, packages, bandwidth that are he currently using.
03.	Sorted	Stored information is clustered to categories
04.	Enable systems	Systems are enabling for browsing and navigate.

D) User Interface requirements

SL	Title	Description
01.	Platform allows	Platform allows users for the admin and the users.
02.	Runs on	Use Interface runs on pc, mobile devices
03.	Authentication	User is informed about the authentication by email or SMS.
04.	Provide data	User can provide profile data. Admin can provide package information, their validity and the WiMAX coverage area etc.
05.	Update data	User and admin can update their provide data.

E) Security requirements

SL	Title	Description
01.	Authentication mechanism	System requires authentication mechanisms for user identification.
02.	User category	Users are classified in three categories (Silver, Gold and Platinum).
03.	Access information	Users can access to specific content based on their username and password.
04.	Encryption	System uses data encryption

5.2.6 Other Non-Functional Requirement Analysis

The restrictions on the types of solutions that will meet the functional requirements. This section presents the nonfunctional requirements, which should be considered during the development of the web based customer relationship management system. This summarization is given below:

SL	Title	Description
01.	Performance	This requirement has to do with QoS characteristics, such as high speed internet availability for data intensive transmissions. It also concerns to the time required for performing the operations allowed by the system.
02.	Scalability/ Expandability	The system should be able to scale and expand the dispatch center to be able to handle more traffic. The system's performance attributes should be maintained independent of the number of nodes or documents. A dramatic increase in the number of nodes or documents will have minimal effect on performance and availability.

03.	Availability	Ensure that authorized users have always access to data and associated assets 24/7 with 100% reliability.
04.	Robustness, Fault Detection and Recovery	It should be ensured that content and content delivery services are available at any time even if some hardware or software components fail to function
05.	Maintainability	If a service has been upgraded, then the old version of the service must be available for some time in order for the IT personnel to upgrade the software to use the new version of the service.
06.	Usability	Easy to use

5.4 Basic View of Administrator Interface

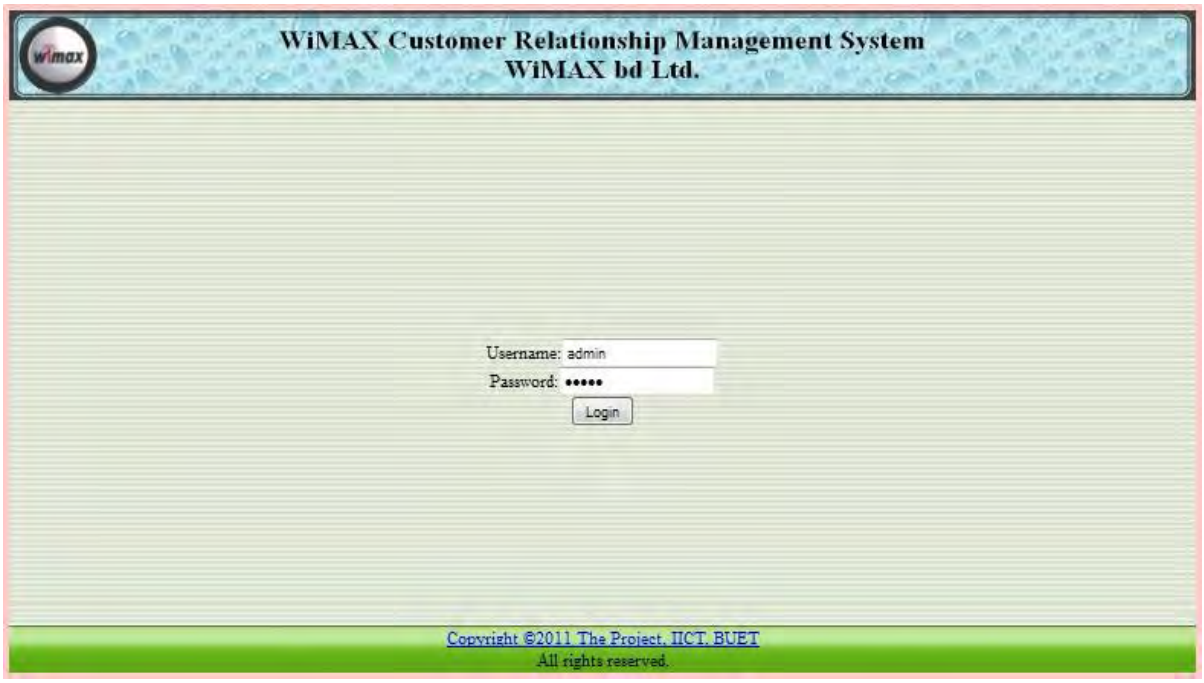


Fig-5.2: Administrator Login Page.

5.3.1 Function of the Administrator Interface

Administrator interface is graphically designed for the administrator to manipulate their customer's information. Graphically the interface is consist of four parts. These are described below:

1. **Top Bar:** Top bar graphically contains the company logo and the company's platform banner.
2. **Left Bar:** System Modification, Card Generation and Notice are graphically includes in the left bar.
3. **Right Bar:** Right bar contains the software main menu and the company's coverage map.
4. **Bottom Bar:** Bottom bar contains the software copy right message.

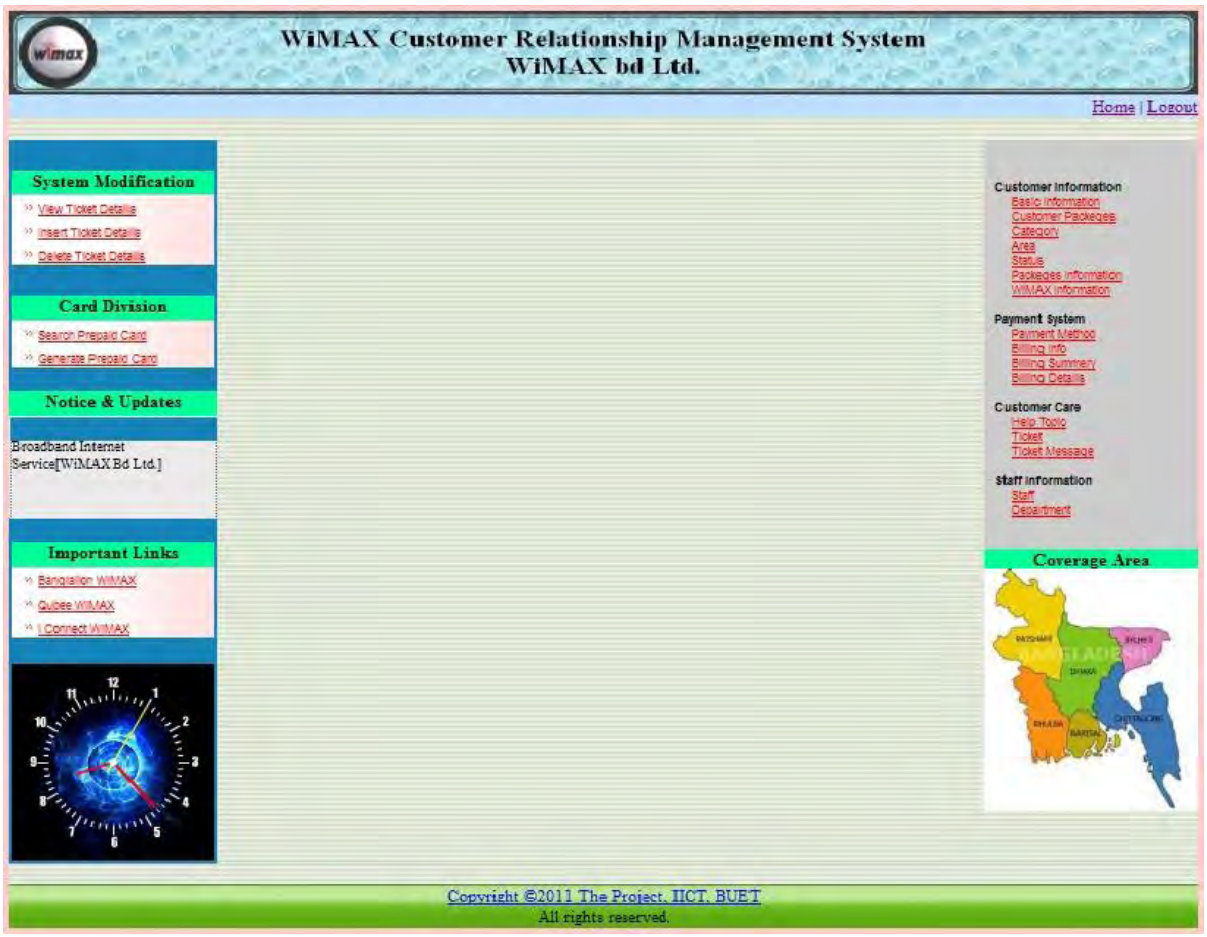


Fig-5.3: Software Home Page.

First of all administrator needs user name and password to login to the software. After that he or she may able to store and update of their customers profile. For example, if you want to insert customer information into the customer management database software you have to select customer information table from the right bar then select insert customer information from the left menu. After selection then a form appear and you have to fill up the required field and submit it to the database software.

5.3.2 Data Insert Process

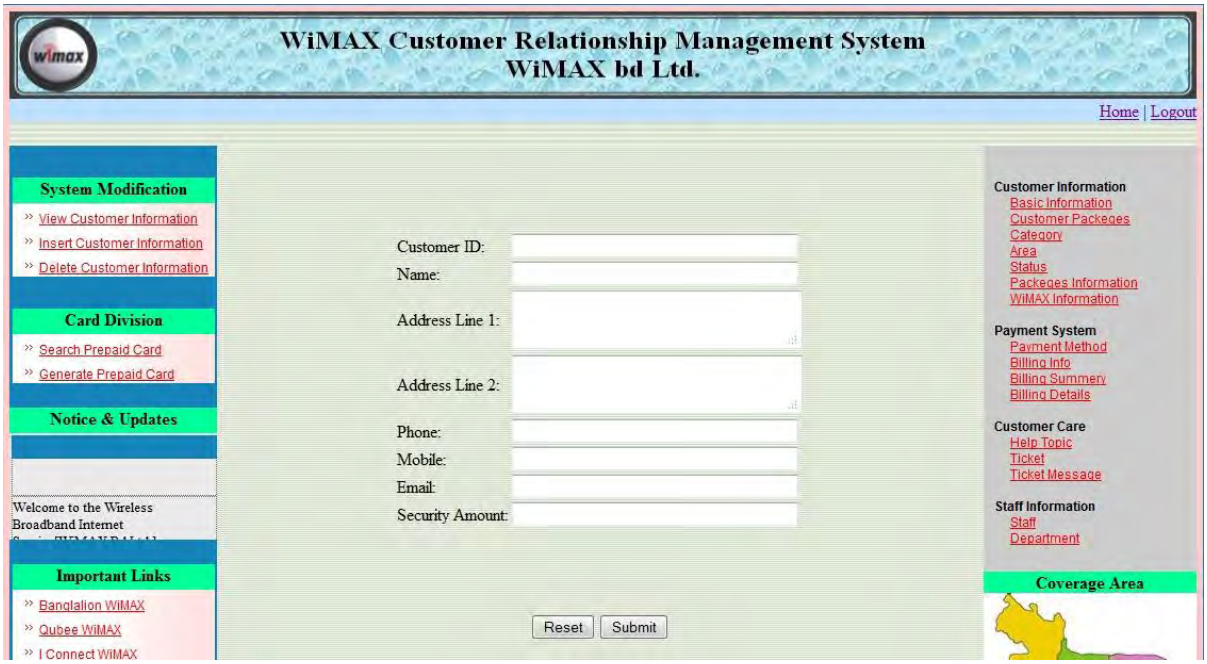


Fig-5.4: Data Insert Process.

Data Insert Steps:-

1. Select an item from right menu.
2. Click on insert from the left bar and fill up the required field.
3. Finally press the submit button.

5.3.3 Data View and Update Process

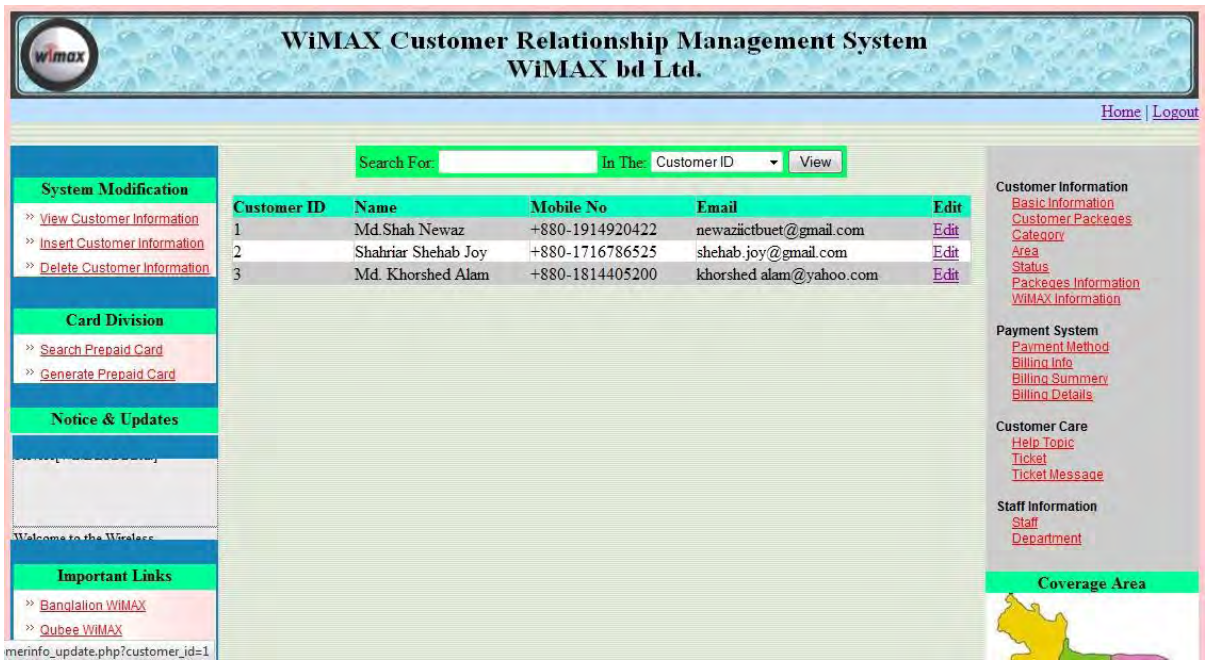


Fig-5.5: Data View and Update Process.

Data View and update Steps:-

1. Select an item from right menu.
2. Click on view from the left bar.
3. Search the customer which you want to view from the combo box.
4. Then click on to the edit button and correct the required field.
5. Finally press the update button.

5.3.4 Basic View of Data Remove Process

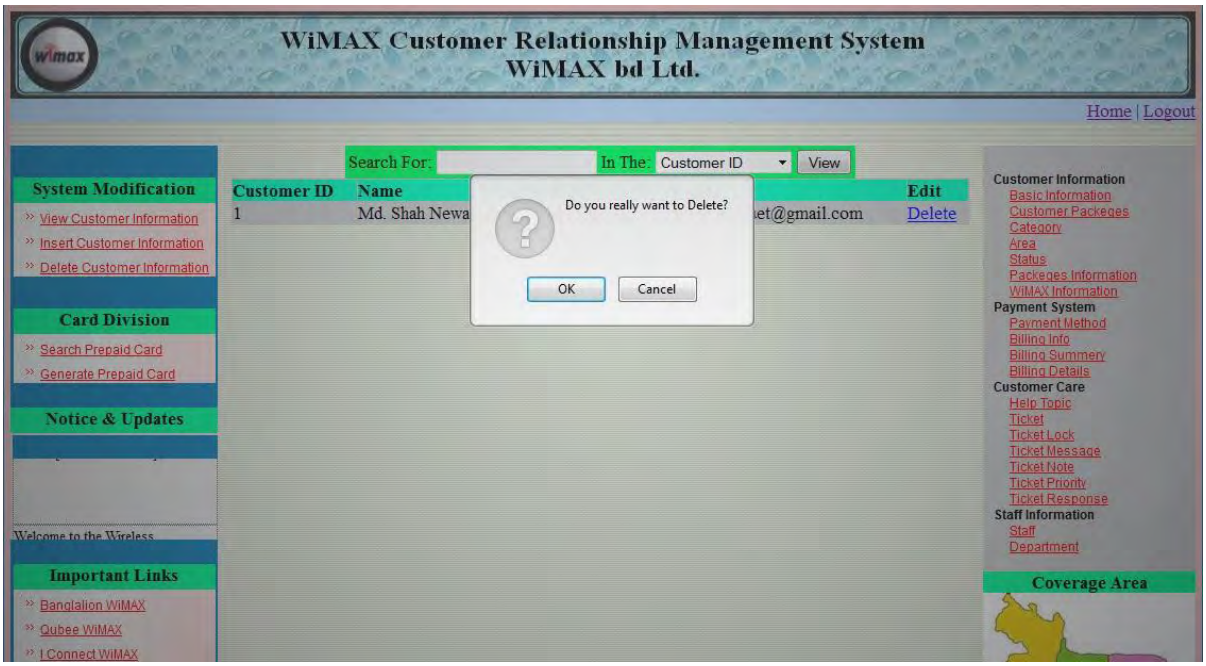


Fig-5.6: Data remove Process.

Data Remove Steps:-

1. Select an item from right menu.
2. Click on delete information from the left bar.
3. Search the customer which you want to delete from the combo box.
4. Then click on to the delete button.
5. Finally press ok button to delete or cancel to abort.

5.3.5 Customer Care with Ticket System

When a customer buy a WiMAX package, he/she will identified a unique ticket number. The service providing organization update customer ticket with a status message and also fill up the required field such as customer ID, Name, Phone, Priority, Email, Dept., Subject, Message Source etc. A sample pages shown here:-

Fig-5.7: Ticket Information Insert Process

5.3.6 Ticket View and Update Process

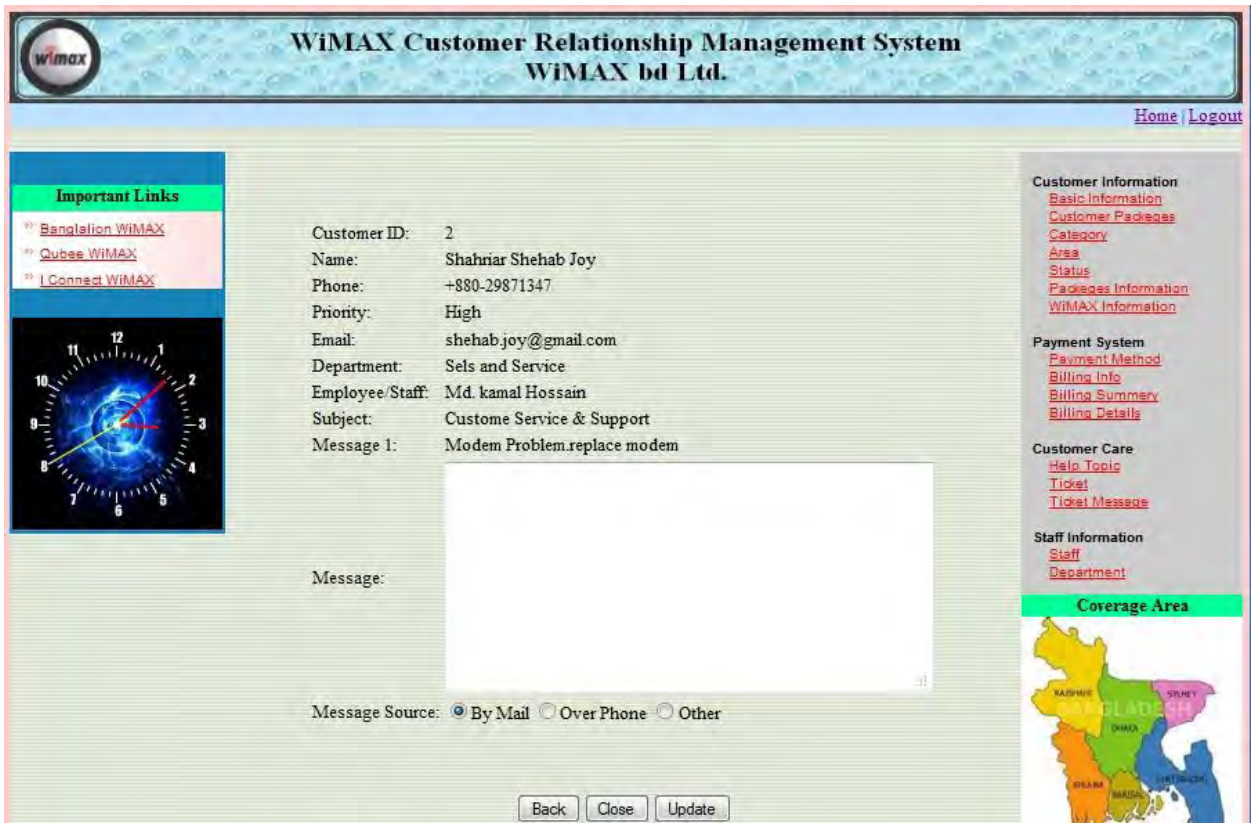


Fig-5.8: Ticket View and update process

After successful generation of ticket then the service providing organization serve their customer by the following steps:-

1. Fill up the message field by customer updates with full address and a phone number also.
2. Fill up the message source field by where you get the customer problems i.e. by mail, over phone or other source.
3. Then press the update button to update the ticket message.

If the service provider solves their customer problems then press the close button. The ticket number is then shown as a close ticket. A sample of closed ticket shown to the next page:-

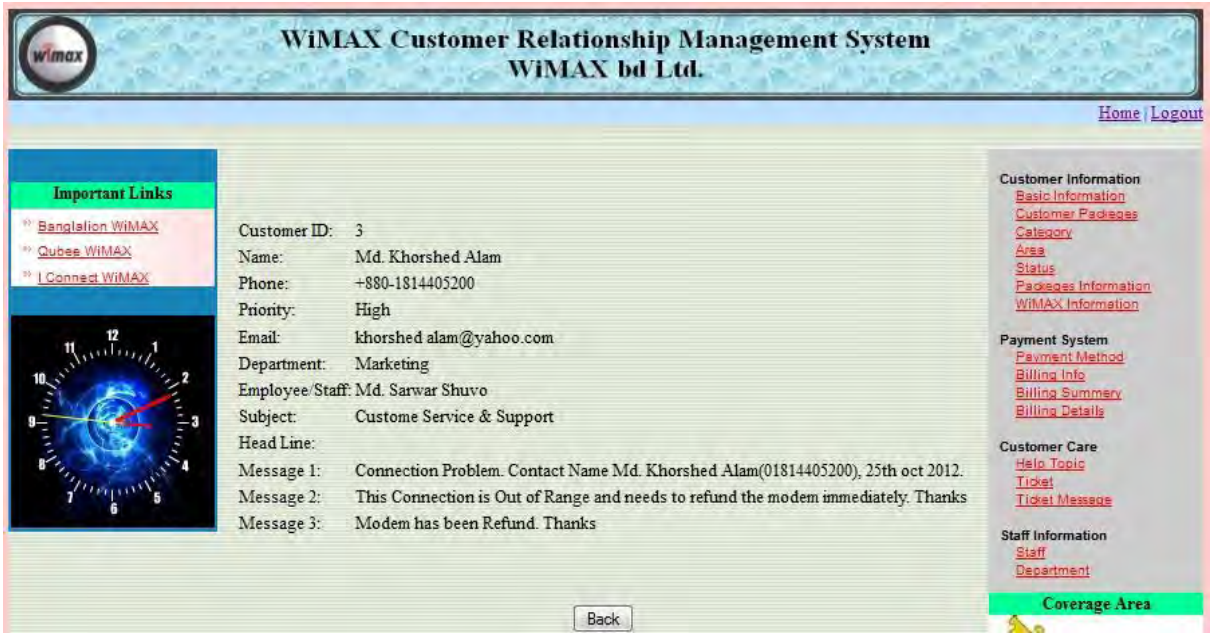


Fig-5.9: Closed Ticket

5.4 Basic View of User Interface

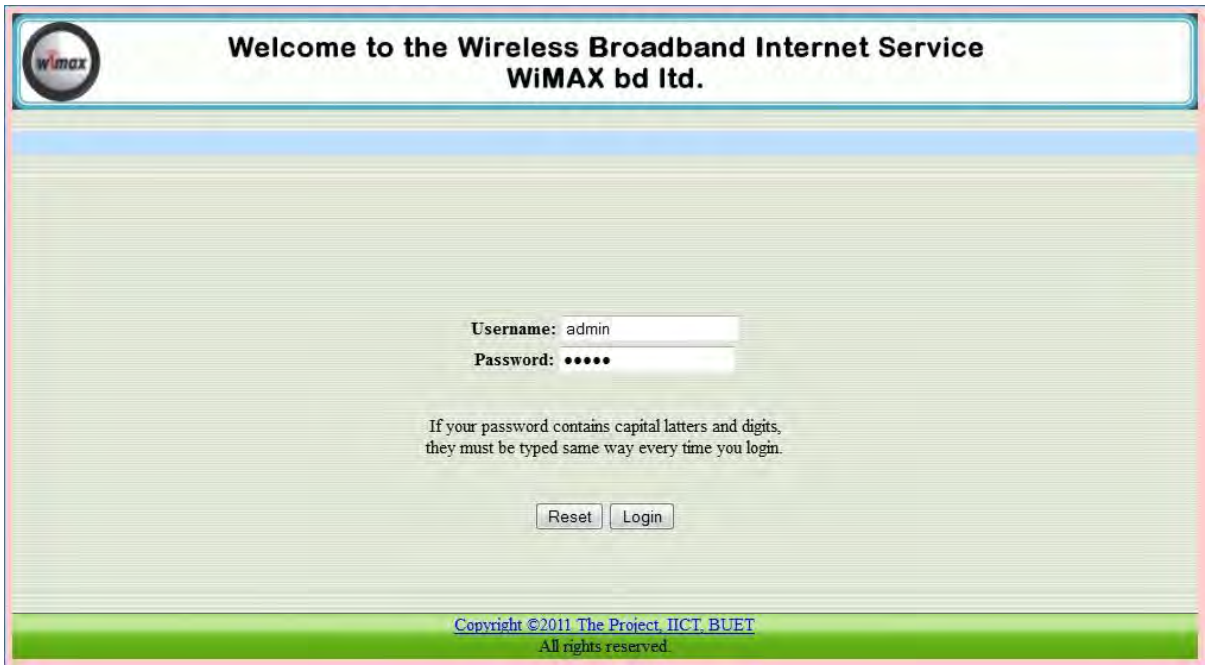


Fig-5.10: User Login Page.

User interface is mainly designed for the customer to authenticate their connection to the network. For login Customer needs user name and password which is provide by the service providing organization. The service providing organization generate user id and password for every individual WiMAX packages.

5.4.1 Function of the User Interface

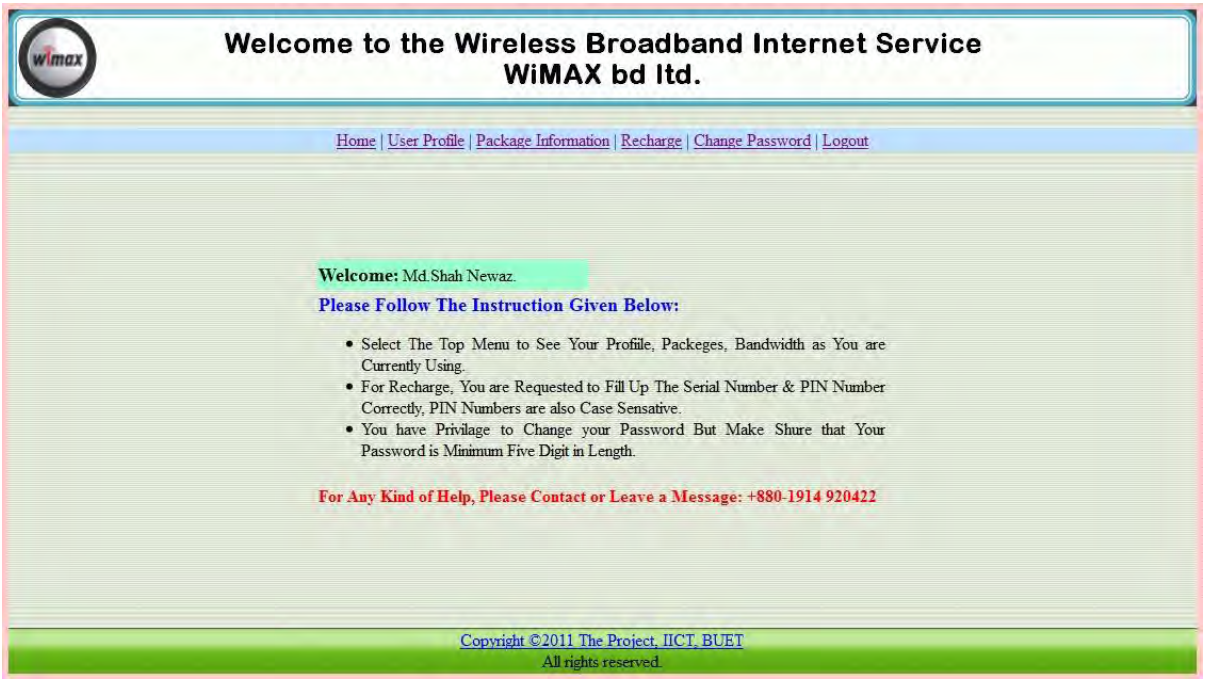


Fig-5.11: User Interface Home Page.

After successful login a menu appear in the user interface. The menu contains six topics item which are known as Home, User Profile, Package Information, Recharge, Change Password and Logout. Though customer provides their personal information by fill up of CIF form, he or she also view and update their profile with the help of this interface. Just click on the edit button, fill up the required field and save permanently.

There are some other functions, Package Information options shows the packages they are currently using. Customer can easily recharge their account through this user interface. If users wants to change their password which is also possible with the help of this user interface.

5.6 Chapter Summary

This chapter presents the basic graphical design of the WiMAX CRM interfaces. There are two interface which is used by the service provider and the user. Software platform, the programming language of the pc software and the interface which is described in this chapter. This chapter also presents how the service provider interact with their customers and how the customer benefited by the service provider. The total working procedure of the WiMAX CRM systems are illustrated in this chapter with example.

CHAPTER - VI

Conclusion and Recommendation

6.1 Conclusion

WiMAX CRM is developed for the service provider and for the WiMAX users to make a communication bridge for interaction, where service provider store their customer's information and serve them through the customer care point. Users are able to authenticate their connection, view and update of their personal information. WiMAX CRM system also developed for the following facilities:

1. The system which we have developed is more flexible and the service provider can easily access to the system, store customers details and retrieve relevant information in a very short time.
2. Service provider use this development to view and update their customer's details instantly.
3. WiMAX CRM system has the real time problem solution and update system.
4. Customers have the opportunity to view their profile, package information, recharge their account and to change password through the user interface.
5. Finally, this developed WiMAX CRM system is a reliable and secured customer database management system which helps the service providing organigation to achieve their customer satisfaction and also fulfill the company needs.

6.2 Recommendation and Future Works

Any Internet service providing organization can use this software with little care. If he/she needs any modification or any other facilities he/she is most welcome to suggest so. The other recommendations on this developed systems are:

1. Java programming language can be used instead of PHP programming due to its platform independency.
2. This software is only tested for some medium scale of Internet service providing organization. If anyone wants to implement it in a large scale organization Oracle can be used instead of MySQL for better performance.

3. Security matters certainly constitute a serious problem for electronic merchants. Many Internet users and even security experts are concerned enough about Internet crime and potential violations of personal privacy. SSL security may be implemented in different modules of the developed software.

4. Some organizations are also being selective about how they use the Internet to communicate with their users e.g. making personal contact by phone after a certain stage in the process even as still using their web based customer relationship database system. Service providing organization can be used alternative technology such as SMS messaging and Interactive voice response (IVR) technology to communicate with the WiMAX customers. Customers have the opportunity to view their profile, package information, recharge their account and to change password through the user interface.

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Appendix

The PHP Source Codes of data insertion are given below:

```
<?php include("session.inc.php");
		if($_POST["submit"]=="Submit"){
		$hostName="localhost";
		$userName="root";
		$password="";
		$dbName="crm";
		$sql_statement="INSERT INTO customerinfo (customer_id,name,addrsline1,addrsline2,phone,mobile,email,security_amount) VALUES ('', '" .$_POST["name"]."', '" .$_POST["addrsline1"].", '" .$_POST["addrsline2"].", '" .$_POST["phone"].",'" .$_POST["mobile"].",'" .$_POST["email"].",'" .$_POST["security_amount"].")";
		mysql_connect($hostName, $userName, $password) or die("Unable to connect to host $hostName");
		mysql_select_db($dbName) or die("Unable to select database $dbName");
		$result=mysql_query($sql_statement) or die("Unable to run query $sql_statement ");
		$id=mysql_insert_id();
		//$row=mysql_fetch_object($result);
		header("location:op_success.php?s=id $id customerinfo_insert");
		//echo "Customer Information Entered.\n";
		//exit();
		}
		?>
<HTML>
<HEAD>
<TITLE>WIMAX</TITLE>
<link rel="stylesheet" media="all" type="text/css" href="images/style.css">
</HEAD>
<BODY bgcolor="#1684B9">
<div align="center">
<table width="1036" bgcolor="#FFCCCC">
<tr>
		<td width="1028" align="center"><table width="1027" bgcolor="#FFCCCC">
    <tr>
```

```
<td align="center" bgcolor="#FFCCCC">
                <table width="100%" border="0" cellspacing="0" cellpadding="0">
  <tr>
   <td align="center" valign="top"><?php include_once "top.php"; ?></td>
  </tr>
                <tr>
 <td height="22" width="1115" background="images/shape.gif"><div align="right"><a href="index.php">Home</a> | <a href="logout.php">Logout</a></div></td>
  </tr>
                <tr>
                 <td height="22" width="1115"><img src="images/back.gif" width="1115" height="22" border="0"/></td>
                 </tr>
  <tr>
   <td align="center" valign="top"><table width="100%"" border="0" cellspacing="0" cellpadding="0" background="images/back.gif">
    <tr>
     <td align="left" valign="top"><?php include_once "left_bar.php"; ?></td>
     <td align="left" valign="top"><table width="100%" border="0" cellspacing="0" cellpadding="0">
      <tr>
       <td width="650" valign="top">
<div align="center">
<form method="post" action="customerinfo_insert.php"><br><br><br><br>
<TABLE>
<TR>
        <TD>Customer ID:</TD>
        <TD><input type="Text" name="customer_id"></TD>
</TR>
<TR>
        <TD>Name:</TD>
        <TD><input type="Text" name="name"></TD>
</TR>
<TR>
        <TD>Address Line 1:</TD>
        <TD><input type="Text" name="addrsline1"></TD>
</TR>
```

```
<TR>
		<TD>Address Line 2:</TD>
		<TD><input type="Text" name="addrsline2"></TD>
</TR>
<TR>
		<TD>Phone:</TD>
		<TD><input type="Text" name="phone"></TD>
</TR>
<TR>
		<TD>Mobile:</TD>
		<TD><input type="Text" name="mobile"></TD>
</TR>
<TR>
		<TD>Email:</TD>
		<TD><input type="Text" name="email"></TD>
</TR>
<TR>
		<TD>Security Amount:</TD>
		<TD><input type="Text" name="Security_amount"></TD>
</TR>
</TABLE><br><br><br><br>

<input type=reset name=reset value="Reset">
<input type=submit name=submit value="Submit">
</form></div></td>
		  </tr>
		 </table></td>
		 <td align="right" valign="top"><?php include_once "right_bar.php"; ?></td>
		</tr>
	   </table></td>
	  </tr>
	  <tr>
	   <td align="center" valign="bottom"><?php include_once "bottom.php"; ?></td>
	  </tr>
	 </table>
			</td>
    </tr>
```

```
   </table>
  </td>
</tr>
</table>
</div>
</BODY>
</HTML>
```

The PHP Source Codes of data view are given below:

```
<?php include("session.inc.php"); ?>
<HTML>
<HEAD>
<TITLE>WIMAX</TITLE>
<link rel="stylesheet" media="all" type="text/css" href="images/style.css">
</HEAD>
<BODY bgcolor="#1684B9">
<div align="center">
<table width="1036" bgcolor="#FFCCCC">
<tr>
<td width="1028" align="center"><table width="1027" bgcolor="#FFCCCC">
    <tr>
     <td align="center" bgcolor="#FFCCCC">
        <table width="100%" border="0" cellspacing="0" cellpadding="0">
       <tr>
        <td align="center" valign="top"><?php include_once "top.php"; ?></td>
       </tr>
        <tr>
      <td height="22" width="1115" background="images/shape.gif"><div align="right"><a
href="index.php">Home</a> | <a href="logout.php">Logout</a></div></td>
       </tr>
        <tr>
        <td height="22" width="1115"><img src="images/back.gif" width="1115" height="22"
border="0"/></td>
        </tr>
       <tr>
```

```
        <td align="center" valign="top"><table width="100%"" border="0" cellspacing="0"
cellpadding="0" background="images/back.gif">
          <tr>
            <td align="left" valign="top"><?php include_once "left_bar.php"; ?></td>
            <td align="left" valign="top"><table width="100%" border="0" cellspacing="0"
cellpadding="0">
              <tr>
                <td width="650" valign="top">
<FORM method="get" action="customerinfo_view.php">
<TABLE align="center" bgcolor="#00FF66">
<TR align="center">
        <TD>Search For:</TD>
        <TD valign="middle"><input type="Text" name="customer_id"></TD>
        <TD>In The:</TD>
        <TD><label>
  <select name="cmbTn" id="cmbTn">
    <option value="customer_id" selected>Customer ID</option>
    <option value="name">Customer Name</option>
    <option value="mobile">Mobile No</option>
          <option value="email">Email</option>
  </select>
        </label></TD>
 <td valign="middle"><input type=submit name=submit value="View"></td>
</TR>
</TABLE>
<p><?php
if($_GET["submit"]=="View"){
$hostName="localhost";
$userName="root";
$password="";
$dbName="crm";
if($_GET["cmbTn"]=="customer_id")
$sql_statement="select * from customerinfo where customer_id='" .$_GET["customer_id"]."'";
else if($_GET["cmbTn"]=="name")
$sql_statement="select * from customerinfo where name like '%" .$_GET["customer_id"]."%'";
else if($_GET["cmbTn"]=="mobile")
$sql_statement="select * from customerinfo where mobile like '%" .$_GET["customer_id"]."%'";
```

```
else if($_GET["cmbTn"]=="email")
$sql_statement="select * from customerinfo where email like '%" .$_GET["customer_id"]."%'";
else
$sql_statement="select ticket_id customer_id, message name from ticket_message";// where
customer_id='" .$_POST["customer_id"]."'";
mysql_connect($hostName, $userName, $password) or die("Unable to connect to host $hostName");
mysql_select_db($dbName) or die("Unable to select database $dbName");
$result=mysql_query($sql_statement) or die("Unable to run query $sql_statement ");
echo '<table width="100%" bgcolor="#cccccc" border="0" cellpadding="0" cellspacing="1"
bordercolor="#F0F0F0">
 <tr bgcolor="#045FCFC">
  <td><strong>Customer ID</strong></td>
  <td><strong>Name</strong></td>
  <td><strong>Mobile No</strong></td>
        <td><strong>Email</strong></td>
        <td><strong>Edit</strong></td>
 </tr>';
while($row=mysql_fetch_object($result)){
?>
</p>
<tr>
  <td><?php echo $row->customer_id?></td>
  <td><?php echo $row->name?></td>
        <td><?php echo $row->mobile?></td>
        <td><?php echo $row->email?></td>
  <td><a href="<?php if($_GET["cmbTn"]=="customer_id" or $_GET["cmbTn"]=="name" ) echo
"customerinfo_update.php"; else echo"ticket_message_update.php"; ?>?customer_id=<?php echo
$row->customer_id ?>">Edit</a></td>
 </tr>
<?php
}
echo '</table>';
}
?>
        </FORM></td>
    </tr>
     </table></td>
```

```
        <td align="right" valign="top"><?php include_once "right_bar.php"; ?></td>
          </tr>
         </table></td>
        </tr>
        <tr>
         <td align="center" valign="bottom"><?php include_once "bottom.php"; ?></td>
        </tr>
       </table>
                    </td>
    </tr>
   </table>
 </td>
</tr>
</table>
</div>
</BODY>
</HTML>
```

The PHP Source Codes of data updates are given below:

```
<?php include("session.inc.php"); ?>
<?php
                $hostName="localhost";
                $userName="root";
                $password="";
                $dbName="crm";
                mysql_connect($hostName, $userName, $password) or die("Unable to connect to host $hostName");
                mysql_select_db($dbName) or die("Unable to select database $dbName");

                $sql_statement="SELECT * FROM customerinfo where customer_id='" .$_GET["customer_id"]."'";
                $result=mysql_query($sql_statement) or die("Unable to run query $sql_statement ");
                $row=mysql_fetch_object($result);

                if($_POST["submit"]=="Update"){
```

```
		$sql_statement="update customerinfo set name = '" .$_POST["name"]."', addrsline1 = '" .$_POST["addrsline1"]."', addrsline2 = '" .$_POST["addrsline2"]."', phone = '" .$_POST["phone"]."', mobile = '" .$_POST["mobile"]."', email = '" .$_POST["email"]."', Security_amount = '" .$_POST["Security_amount"]."'
		where customer_id='" .$_POST["customer_id"]."'";

		$result=mysql_query($sql_statement) or die("Unable to run query $sql_statement ");
		//$row=mysql_fetch_object($result);
		header("location:op_success.php?s=customerinfo_update");
		//echo "Customer Information updated.\n";
		//exit();
		}
		?>
<HTML>
<HEAD>
<TITLE>WIMAX</TITLE>
<link rel="stylesheet" media="all" type="text/css" href="images/style.css">
</HEAD>
<BODY bgcolor="#1684B9">
<div align="center">
<table width="1036" bgcolor="#FFCCCC">
<tr>
		<td width="1028" align="center"><table width="1027" bgcolor="#FFCCCC">
    <tr>
     <td align="center" bgcolor="#FFCCCC">
			<table width="100%" border="0" cellspacing="0" cellpadding="0">
        <tr>
          <td align="center" valign="top"><?php include_once "top.php"; ?></td>
        </tr>
			<tr>
      <td height="22" width="1115" background="images/shape.gif"><div align="right"><a href="index.php">Home</a> | <a href="logout.php">Logout</a></div></td>
        </tr>
			<tr>
			 <td height="22" width="1115"><img src="images/back.gif" width="1115" height="22" border="0"/></td>
			 </tr>
```

```
        <tr>
         <td align="center" valign="top"><table width="100%"" border="0" cellspacing="0" cellpadding="0" background="images/back.gif">
          <tr>
           <td align="left" valign="top"><?php include_once "left_bar.php"; ?></td>
           <td align="left" valign="top"><table width="100%" border="0" cellspacing="0" cellpadding="0">
            <tr>
             <td width="650" valign="top">
<div align="center">
<form method="post" action="customerinfo_update.php"><br><br>
<TABLE>
<TR>
            <TD>Customer ID:</TD>
            <TD><input type="Text" name="customer_id" value="<?php echo $row->customer_id; ?>"></TD>
</TR>
<TR>
            <TD>Name:</TD>
            <TD><input type="Text" name="name" value="<?php echo $row->name; ?>"></TD>
</TR>
<TR>
            <TD>Address Line 1:</TD>
            <TD><input type="Text" name="addrsline1" value="<?php echo $row->addrsline1; ?>"></TD>
</TR>
<TR>
            <TD>Address Line 2:</TD>
            <TD><input type="Text" name="addrsline2" value="<?php echo $row->addrsline2; ?>"></TD>
</TR>
<TR>
            <TD>Phone:</TD>
            <TD><input type="Text" name="phone" value="<?php echo $row->phone; ?>"></TD>
</TR>
<TR>
            <TD>Email:</TD>
```

```
                <TD><input type="Text" name="email" value="<?php echo $row->email; ?>"></TD>
</TR>
<TR>
                <TD>Mobile:</TD>
                <TD><input type="Text" name="mobile" value="<?php echo $row->mobile; ?>"></TD>
</TR>
<TR>
                <TD>Security Amount:</TD>
                <TD><input type="Text" name="Security_amount" value="<?php echo $row->Security_amount; ?>"></TD>
</TR>
</TABLE><br><br><br><br><br>
<input type=button value="Back" onClick="history.go(-1)">
<input type=reset name=reset value="Reset">
<input type=submit name=submit value="Update">
</form></div></td>
              </tr>
             </table></td>
             <td align="right" valign="top"><?php include_once "right_bar.php"; ?></td>
            </tr>
           </table></td>
         </tr>
         <tr>
          <td align="center" valign="bottom"><?php include_once "bottom.php"; ?></td>
         </tr>
        </table>
                        </td>
    </tr>
   </table>
  </td>
</tr>
</table>
</div>
</BODY>
</HTML>
```

The PHP Source Codes of data deletion are given below:

```
<?php include("session.inc.php"); ?>
<HTML>
<HEAD>
<TITLE>WIMAX</TITLE>
<script language="javascript" type="text/javascript">
function delConf(){
answer = confirm("Do you really want to Delete?")
                if (answer !=0)
                    return true;
return false;
}
</script>
<link rel="stylesheet" media="all" type="text/css" href="images/style.css">
</HEAD>
<BODY bgcolor="#1684B9">
<div align="center">
<table width="1036" bgcolor="#FFCCCC">
<tr>
                <td width="1028" align="center"><table width="1027" bgcolor="#FFCCCC">
    <tr>
     <td align="center" bgcolor="#FFCCCC">
                    <table width="100%" border="0" cellspacing="0" cellpadding="0">
        <tr>
          <td align="center" valign="top"><?php include_once "top.php"; ?></td>
        </tr>
                            <tr>
      <td height="22" width="1115" background="images/shape.gif"><div align="right"><a
href="index.php">Home</a> | <a href="logout.php">Logout</a></div></td>
        </tr>
                            <tr>
                             <td height="22" width="1115"><img src="images/back.gif" width="1115"
height="22" border="0"/></td>
                             </tr>
        <tr>
```

```
        <td align="center" valign="top"><table width="100%"" border="0" cellspacing="0" cellpadding="0" background="images/back.gif">
          <tr>
            <td align="left" valign="top"><?php include_once "left_bar.php"; ?></td>
            <td align="left" valign="top"><table width="100%" border="0" cellspacing="0" cellpadding="0">
              <tr>
                <td width="650" valign="top">


<FORM method="get" action="customerinfo_del.php">
<TABLE align="center" bgcolor="#00FF66">
<TR align="center">

                <TD>Search For:</TD>
                <TD valign="middle"><input type="Text" name="customer_id"></TD>
                <TD>In The:</TD>
                <TD><label>
  <select name="cmbTn" id="cmbTn">
    <option value="customer_id" selected>Customer ID</option>
    <option value="name">Customer Name</option>
    <option value="ticket_id">Ticket</option>
  </select>
                </label></TD>
                <td valign="middle"><input type=submit name=submit value="View"></td>

</TR>
</TABLE>

<?php
if($_GET["submit"]=="View"){
$hostName="localhost";
$userName="root";
$password="";
$dbName="crm";
if($_GET["cmbTn"]=="customer_id")
$sql_statement="select * from customerinfo where customer_id='" .$_GET["customer_id"]."'";
```

```
else if($_GET["cmbTn"]=="name")
$sql_statement="select * from customerinfo where name like '%" .$_GET["customer_id"]."%'";
else if($_GET["cmbTn"]=="mobile")
$sql_statement="select * from customerinfo where mobile like '%" .$_GET["customer_id"]."%'";
else if($_GET["cmbTn"]=="email")
$sql_statement="select * from customerinfo where email like '%" .$_GET["customer_id"]."%'";

else
$sql_statement="select ticket_id customer_id, message name from ticket_message";// where customer_id='" .$_POST["customer_id"]."'";
mysql_connect($hostName, $userName, $password) or die("Unable to connect to host $hostName");
mysql_select_db($dbName) or die("Unable to select database $dbName");
$result=mysql_query($sql_statement) or die("Unable to run query $sql_statement ");
echo '<table width="100%" bgcolor="#cccccc" border="0" cellpadding="0" cellspacing="1" bordercolor="#F0F0F0">
 <tr bgcolor="#045FCFC">
  <td><strong>Customer ID</strong></td>
  <td><strong>Name</strong></td>
  <td><strong>Mobile No</strong></td>
            <td><strong>Email</strong></td>
            <td><strong>Edit</strong></td>
 </tr>';
while($row=mysql_fetch_object($result)){
?>
<tr>
  <td><?php echo $row->customer_id?></td>
  <td><?php echo $row->name?></td>
            <td><?php echo $row->mobile?></td>
            <td><?php echo $row->email?></td>
  <td><a href="customerinfo_delete.php?id=<?php echo $row->packege_id?>" onClick="return delConf();">Delete</a></td>

 </tr>


<?php
}
```

```
echo '</table>';
}
?>
                </FORM></td>
     </tr>
      </table></td>
        <td align="right" valign="top"><?php include_once "right_bar.php"; ?></td>
          </tr>
         </table></td>
        </tr>
        <tr>
         <td align="center" valign="bottom"><?php include_once "bottom.php"; ?></td>
        </tr>
       </table>
                    </td>
    </tr>
   </table>
                </FORM></td>
     </tr>
      </table></td>
        <td align="right" valign="top"><?php include_once "right_bar.php"; ?></td>
          </tr>
         </table></td>
        </tr>
        <tr>
         <td align="center" valign="bottom"><?php include_once "bottom.php"; ?></td>
        </tr>
       </table>
                    </td>
    </tr>
   </table>
  </td>
</tr>
</table>
</div>
</BODY>
</HTML>
```