



**INVENTORY MANAGEMENT SYSTEM  
FOR  
TELE SOON PHONE SHOP**

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# DECLARATION

I certify that this dissertation does not incorporate, without acknowledgement, any material previously submitted for a Degree or Diploma in any university and to the best of my knowledge and belief, it does not contain any material previously published or written by another person on myself except where due reference is made in the text. I also here by give consent for my dissertation, if accepted to be made available for photocopying and for inter-library loans, and for the title and summary to be made available to outside organizations.

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# ABSTRACT

Inventory Management System is important for any business organizations. It is vital important for organizations which are operating purchasing, stock control and sales. The Tele soon phone shop is functioning as a private business organization. And this is one of best phone shop in Jaffna. When providing the services, there should be a proper mechanism to manage their day to day activities, which has been handled with heavy paper work currently and which will be inefficient and time wasting. As a solution we can get an aid from the information technology. Inventory management system is emerged to reduce these problems and will increase the competency and efficiency of their work.

This system has provided many facilities such as sales, stock maintenance, orders for purchase and generating yearly, monthly, weekly and timely reports and preparing the summary details. This system will help to give an improved customer service to their customers.

The evolutionary development with waterfall method is used to develop methodology and it is an object oriented system design.

The Inventory Management system was developed using Microsoft Visual Studio.Net 2008 and Microsoft SQL Server 2008 Enterprise Edition. This combination ensures a high portability to develop the system. Microsoft visual studio has been selected as the IDE (integrated development environment).Further SQL server 2008 database has been selected as the database to store the data of the system. Further this system has provided automation of the processes and become an aid to face the competition and future forecasting about the business.

# ACKNOWLEDGEMENT

It is a great delight that I was able to complete my software project successfully by undertaking a project titled “Inventory Management System for Telesoon Phone Shop.”

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# LIST OF ACRONYMS

CD	<u>C</u> ompact <u>D</u> isk
CD Rom	Compact disk read only memory (Compact disk)
DB	<u>D</u> ata <u>B</u> ase
DBMS	Data Base Management System
ER diagram	<u>E</u> ntity <u>R</u> elationship diagram, Show the entities and relationship between them
GUI	<u>G</u> raphical <u>U</u> ser <u>I</u> nterface
GB	<u>G</u> iga <u>B</u> yte, unit of memory in a computer 1024MB = 1 GB
IMS	Information Management System
Prompt	A message displayed on a screen requesting a response from the user
ROL	Re-Order Level
SQL server 2008	Structured Query Language server 2008, is a database management system
VB.Net	Visual Basic .Net
Byte	Unit of memory storage in the machine needed to store one character of information

# CHAPTER 1 : INTRODUCTION

## 1.1 Overview

This chapter describes an Inventory Management System Development project for “Tele soon phone shop”. Maintaining of Inventory and Sales Management will be implemented by this IMS. IMS includes inventory, purchase, sales, and expenses with some basic accounting activities.

Inventory Management System is always having an ability of user friendliness. So, an authorized user with minimum computer knowledge may handle the system easily. By this reason system continuously validates user’s transactions and makes proper announcements through prompt message. Also the system provides effective services to maintain day to day transactions and inventory of the Tele soon Phone Shop.

It will be more capable and protected system than the current manual system. The Inventory Management System for Tele soon phone shop is primarily Inventory and some basic accounting activities, which will be used to automate the daily Inventory and basic monthly accounting activities, report generation, and decision making of Tele soon phone shop.

Inventory management system is providing the services, there should be a proper mechanism to manage their day to day activities, which has been handled with heavy paper work currently and which will be inefficient and time wasting. As a solution we can get an aid from the information technology. Inventory management system is emerged to reduce these problems and will increase the competency and efficiency of their work.

## 1.2 Motivation of the project

Now, all kinds of human needs are increased. At the same time, information technology is being developed very, very fast. In the competitive business world, people expect a very efficient, effective with quick and quality services from goods/service providers.

Now-a day, mobile phones are vital for everyone’s life. These mobile phones are available in market with different models, different facilities, and so on.

Therefore, this project is a small attempt to provide an efficient and effective with quick and quality services through Inventory Management System for Tele soon Phone Shop, which is a mobile phone business organization.

At present, available inventory, sold items, orders for purchase and other business related activities are entered and calculated manually with the consumption of a lot of man power. Therefore, it was decided to analyze, design and develop a system to automate the day to day transactions of Tele soon Phone Shop to give an efficient, effective with quick and quality services for their customers. Improved customer services lead to increase profitability of the organization.

### 1.3 Objectives

The objective of this project is to introduce a computer based Inventory Management system to the Tele soon phone shop, Jaffna. This system will perform the stock control and basic common accounting activities of the above Tele soon phone shop efficiently and effectively. The staff of the Tele soon phone shop will feel better to work with the system by comparing with the existing manual system. It will be an off line system, but can be extended to online at future according to the requirements. It will provide an efficient database and generate variety of reports that needed to the Administration of the Tele soon phone shop.

- To provide a user -friendly system for all employer and employees of the phone shop, this will make easy to carry out their day to day work.
- The system will provide updated details in an efficient manner for easy decision making of the managerial level staff.
- The system will provide the reports of current position of the inventory. Will help to identify the new requirements of the customers.
- This system will maintain the information correctly, that will help for day to day transactions and other works.
- Maintaining the Re order levels of the stock items by providing the alert and other guide lines through messages to the user.
- Searching facilities are to be given in the new system, such as search by product name, product type, product category and all other important needed searching facilities.
- To facilitate the employer and employees to work with a graphical user interface (GUI) system. By this, training time for system learning will be reduced.

## 1.4 Scope

The Scope of this project is to deliver an efficient and effective Inventory Management system for Tele soon Phone Shop to handle the day to day transactions such as sales, purchase, sales order, purchase order, product's details and generating yearly, monthly, weekly and timely reports and prepare the summary details. These are the main functionalities of the proposed system.

# CHAPTER 2 : ANALYSIS

## 2.1 Introduction

System analysis is one of the main phases in the software development life cycle. System analysts will help to get an overall image of the system and will be able to produce a high level description of the system through this phase. Main objectives of this phase are what services system should provide, required performance of the system. Before analyzing the system, first the requirements should be gathered by using the fact finding techniques, such as interviews, observations, sample documentations etc. [6].

## 2.2 Analyze the Existing Manual System

Inventory Management system for Tele soon Phone Shop is done by manually. The manual Inventory management system contains human errors as calculation errors. In this manual method, Inventory taking process is a very time consuming process with the need of considerable amount of man powers.

Report regarding the available Inventory items or for the purchase order are not easy to get immediately. This is a major problem of the management. Sometimes unknown the out of Inventory items, at the same time some of the items idle for a long period of time. This situation is not good for the shop. In business, customer's requests are fulfilled by the shop is an important factor. Therefore, the optimum levels of the Inventory have been maintained by business organization.

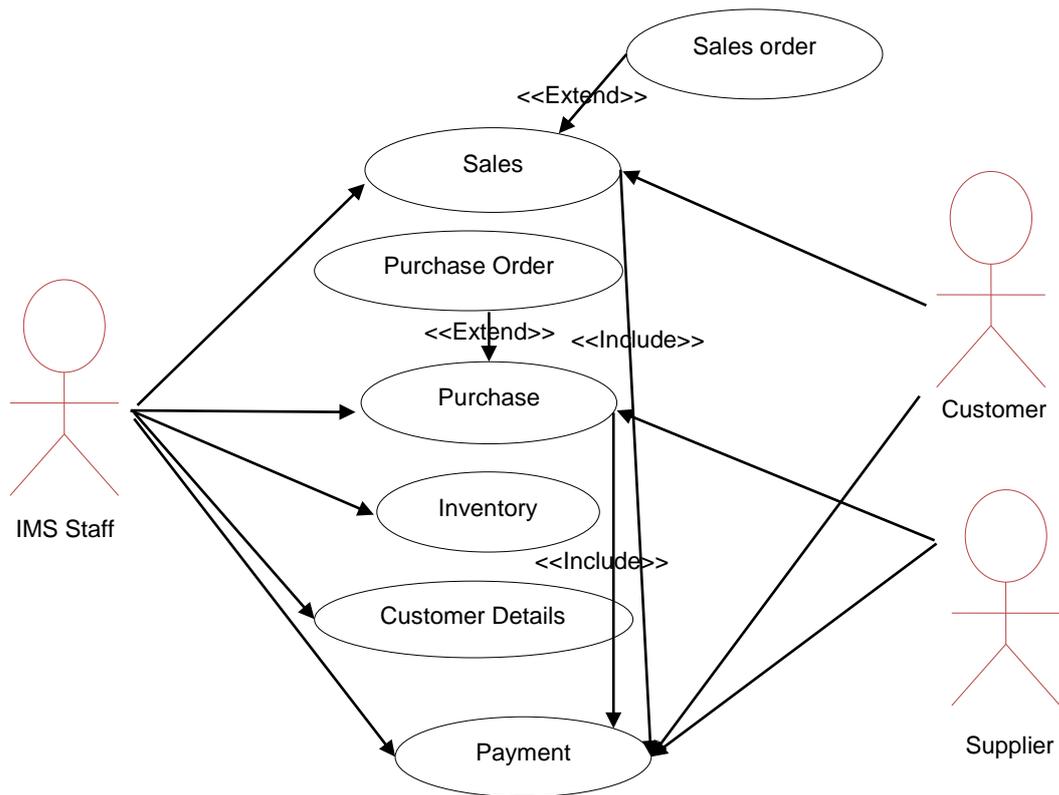


Figure 2-1: Use case diagram for Existing Manual System

### 2.3 Outline of Existing Similar System

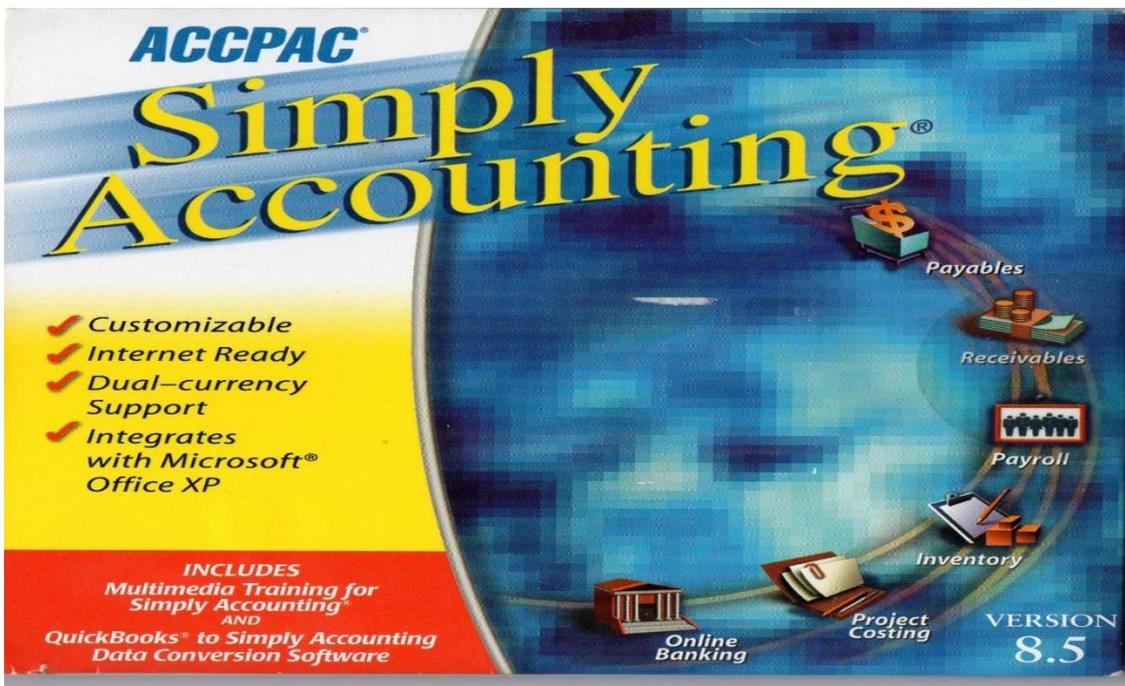


Figure 2-2: AccPac Simply Accounting Pro

Inventory has a lot of facilities and it is a Multi-user system. Here, the **AccPac Simply Accounting Pro** [8] user can assign different units of measure for buying, selling, and stocking items. But, it gives alert message only when a user sales an item. With that, the user has to make purchase order manually. And it also hasn't the supplier wise purchase order report facilities.



Figure 2-3: Tally 9

The **Tally 9.0** has many accounting and inventory facilities. But, there are no advance facilities with sales and purchase processes [9]. It has inventory voucher creation facilities when transaction happens. With that, it has ratio analysis (Quick ratio = current assets-stock-in-hand: current liabilities), balance sheet and profit & loss account facilities. However, only the Accounting & computer knowledge user can operate the above software two packages and have to customize the software for special needs.

## 2.4 Fact finding Techniques

Gathering client's requirements by using the fact finding techniques are the most critical part in the analysis phase. When gathering the requirements, there should be a proper way to handle these techniques. There are several fact finding techniques which can be used to collect the clear and accurate information. In this project facts were gathered by using following techniques.

1. Interviewing
2. Questionnaires
3. Observation.
4. Prototyping

**Interviews** – This method is used to collect the information from groups or individuals. Analyst selects the people who are related with the system for the interview. In this method the analyst sits face to face with the people and records their responses. The interviewer must plan in advance the type of questions he/ she is going to ask and should be ready to answer any type of question. He should also choose a suitable place and time which will be comfortable for the respondent.

The information collected is quite accurate and reliable as the interviewer can clear and cross check the doubts there itself. This method also helps gap the areas of misunderstandings and help to discuss about the future problems. Structured and unstructured are the two sub categories of Interview. Structured interview is more formal interview where fixed questions are asked and specific information is collected whereas unstructured interview is more or less like a casual conversation where in-depth areas topics are covered and other information apart from the topic may also be obtained.

**Questionnaires** – Here the analysts can collect data from large groups. Questionnaires could be Open-ended or Close questionnaires. Open-ended questionnaires are used to learn feelings, opinions, general experiences on process detail or problem. In it, questions are answered in their own words. Where as in closed questionnaires a set of prescribed answers are used and specific response have to be selected. This is a costly affair as the questions should be printed out.

**Observation** – This is a skill which the analysts have to develop. The analysts have to identify the right information and choose the right person and look at the right place to achieve his objective. He should have a clear vision of how each departments work and work flow between them and for this he should be a good observer. [WWW3]

Requirements of this system are gathered from the users of this system, who are involved in the day to day manual transaction works. Interviewed with the Director and staff, observed the stock books, ledgers and other relevant documents and discussed with them to gather the information. And questionnaire technique is also used to gather information regarding the system.

An analyst can typically apply more than one technique during a single system development project. In this project it was recommended that the Interviewing, questionnaires and observation methods are appropriate at the client environment.

## 2.5 Data Gathering Using Questionnaires

1. What is the main critical activity in your phone shop?
  - Inventory Management
2. What are the main activities do you want to computerize?
  - Inventory, Transactions, Products, Staff Details
3. Please give your detail activities you want to computerize?
  - Staff details
  - Staff payment
  - Sales
  - Sales order
  - Purchase
  - Customer details
  - Supplier details
  - Purchase order
4. Do you want to print sales invoice?
  - Yes
5. Do you want to print reports?
  - Yes
6. Do you need password system?
  - Yes, it is essential.
7. What are the expenses do you want to apply?
  - Electricity bill payment
    - Transport payment
    - Staff salary
    - Other payments
    - Telephone bill payment
8. Do you need automatically generate sales bill no and Product code?
  - Yes.
9. Do you need summarized and viewing reports?
  - Yes.

## 2.6 Requirements of the IMS

Consider the drawbacks of the existing manual system, the proposed Inventory Management system for Tale Soon phone Shop computerized system requirements can be categorized as functional requirements and non-functional requirements.

### 2.6.1 Functional Requirement

What the system is supposed to achieve, is known as functional requirements. Functional requirement can be a calculation, technical detail, etc. Following are the functional requirements that have been identified through the system analysis. The following functional requirements are identified in the IMS.

- Entering and storing the details of Customers and Sales, Purchase Item in the system.
- Calculating the bill amount payable according to the Items.
- Printing necessary bill with sequentially generated the particular customers
- Making discount payments for the customer's request
- Obtaining detailed printouts of day's transactions
- Reminders for low quantity Product details via Sales
- Updating the Customer profile
- Updating the Product details

Requirements of the customer

- Obtaining item outstanding via Advertisement
- Obtaining the details of Items such as outstanding amount and history of payments made.

### 2.6.2 Non Functional Requirement

Not only the functional requirements, but also the non-functional requirements are vital to the successful implementation of this project. Although they are not directly concerned, it was found out that there are many non-functional areas which have to address in order to complete this system in successfully. Main non-functional requirements which need to be achieved are described below.

- **Accuracy and consistency** of the system is very important. In this project there exist quite a few functionalities which accuracy is very vital. Entering data should be validated by the system.

- **Reliability** is another main non-functional requirement which is required by the users. Although it does not specified directly. Keeping database backup is important in this regard [5].
- **Software Security** of the system is a very important thing. Only the authorized persons should be allowed to operate the system with their own username and password only.
- **User friendliness** is another key factor to the success of the system. User interfaces should be designed in such a way that will help to handle the system easily with attractive look and feel and it should motivate the users to use it.
- **Provide help facility** for the users is important to enhance the user friendliness and the system will always assist the user during the operations that the user wants to perform using this system.
- **Portability** of the system – This system will work on all the Windows based operating systems well, which are above Windows 7.
- **Experiences of user** are another factor. Some experience in Windows Graphical User Interface and a considerable typing speed is enough to use the system. Otherwise user has to be trained in addition to the system handling training.
- **Response time & Processing time** –Although this was not specified by the users, in general it is needed that the system should give response to the user without much delay.

## 2.7 Entities of the IMS

The entities and their relationships were identified by having conversation with the user. Following entities have been identified and documented as follows.

1. Customer details
2. Supplier details
3. Staff details
4. Sales details
5. Sales order
6. Purchase details
7. Purchase order
8. Products

The entities, attributes and the relationship between them were identified and documented in the ER Diagram.

## 2.8 System Requirements

### 2.8.1 A Hardware Requirements: A standard PC with

	<b>Best performance</b>	<b>Minimum requirement</b>
Processor	Quart Core 1.2GHZ or above	Pentium IV 1.2GHZ or above
Memory	1GB or above	512 MB
Hard disk space	40 GB or above (also for backup)	20GB
Input	USP Keyboard & Optical mouse	Any keyboard and mouse
Out put	Color monitor, Laser printer	Color monitor, Dot-matrix printer
Disk Drives	CD/DVD-RW	CD writer
Power	High power UPS	Normal UPS
Printer	Dot matrix printer	Any A4 size printer

Table 2-1: Hardware Requirements

### 2.8.2 Soft ware Requirements

- Windows 7 professional or latest version
- Microsoft SQL server 2008
- Microsoft Visual Basic .Net 2008 framework 3.5

### 2.8.3 User Requirement of the IMS

1. Fundamental knowledge in handling Windows 7 operating system
2. Considerable typing speed to use the system for data entry.
3. Basic knowledge in database management system.
4. Basic knowledge to operate printers.

If users of the system do not have the experience mentioned above, special training should be arranged by the administration.

### 2.8.4 User training

The users of the proposed system are familiar with the current manual system. So, user training will be needed until the user will get enough experience to operate the new information system. Because the proposed system will be unfamiliar to the user even he/she already have any experience in using computers.

# CHAPTER 3 : DESIGN

## 3.1 Introduction

System design focused on the technical or implementation aspect of the system development project. System analysis phase of the system development project is implementation independent. Design is much more creative process than analysis. System designer converts the requirements from the requirement analysis phase into technical solutions. System design considers the software architecture, database design and interfaces design [7]. There are several techniques exist to design a system, Such as:

1. Structured design techniques
2. Object oriented design techniques
3. Prototyping
4. Rapid Application techniques
5. Joint Application Development

These techniques are used in relation to the scope and the goal of the project.

## 3.2 Techniques Used in the System

It was decided to follow the structured design techniques in the development of Inventory Management system for Tele soon Phone Shop. Hence guidance and ideas can be obtained easily.

1. Commonly developers have experience and familiarity in structured design techniques.
2. Client had a clear picture of their business requirements.

Other techniques such as prototyping are not essential. The proposed system is an average complex system. The project cannot be completed within a few days. So this project cannot be fit into Rapid Application Development (RAD) environment.

Finally, it was decided to follow the structured design technique which is a better decision for this project among other techniques. But in modern situation, it is not possible to follow the pure structured design concepts only. (i.e due to the usage of popular programming languages, such as C++, Visual Basic, Java and Visual Basic .Net. These programming languages based on object oriented based programming.)

### 3.3 System Development Life Cycle

When automating an Information System, it is needed to be developed in a methodical way to make it more robust and also to deliver a validated system to the client. A validated system is one that has no errors and also which satisfies the requirements of the client. So when an Information System is being developed, a system development methodology is used [2].

A system development methodology is a very formal and precise system development process that defines a set of activities, methods, best practices, deliverables and automated tools for system developers and project managers, to use to develop and maintain an information system.

There are several methodologies or models that can be used to guide the software development lifecycle. Some of these include:

- Linear or Waterfall model (which was the original SDLC method)
- Rapid Application Development (RAD)
- Joint Application Development (JAD)
- Prototyping model
- Fountain model
- Spiral model

Usually a few models are combined into a hybrid methodology to make the best fit for the project.

### 3.4 Alternate solutions

During this phase the detailed specification for the proposed software is created. The objects discovered during the analysis phase are refined, and the database is modelled. User interfaces are also designed. The design phase uses the information collected earlier in order to accomplish the logical design of the information system. This consists of designing of user interfaces, Database and Design outputs along with users, to meet their information needs.

IMS design focused on the technical or implementation aspect of the system development project. System analysis phase of the system development project is implementation independent. System designer converts the requirements from the requirement analysis phase into technical Solutions. System design considers the software architecture, database design and interfaces design.

### 3.4.1 Reason for choosing the windows based system

Many people like to use the structured design method according to its popularity, familiarity and the cost effective construction.

- It can be customized and extended easily based on the client's needs
- There is no problem arises based on the internet connectivity
- More secure than web based systems
- Can include more customized reports

## 3.5 Application architecture design

The important activity in the design phase is software architecture design. It describes how the functionality and duties of the system are segmented into sub systems and how they are organized.

The proposed IMS is a standalone software system. The functional environment of the software is described below.

- The software will be used in a Personal computer
- Microsoft windows 7 professional or latest versions of operating system will be used.
- The user of the system has a limited knowledge about information technology.

## 3.6 Interface design

The proposed IMS system was completely explained by the requirement specification in the above section. The Use Case diagrams are used to describe the system functionality. Following typical modules were identified.

1. Authentication module
2. Registration / Enter details module
3. Sales and marketing module
4. Purchase module
5. Tally the expenses module

## 3.7 Database design in the IMS

Data models, which were developed during the data modeling phase are translated into data structures suitable for the selected database technology [3].



### 3.7.2 Use case diagram for login

These help with understanding user requirements and provide a broad view of the primary functionality of the system. This is a way that non-functional people can understand the concept.

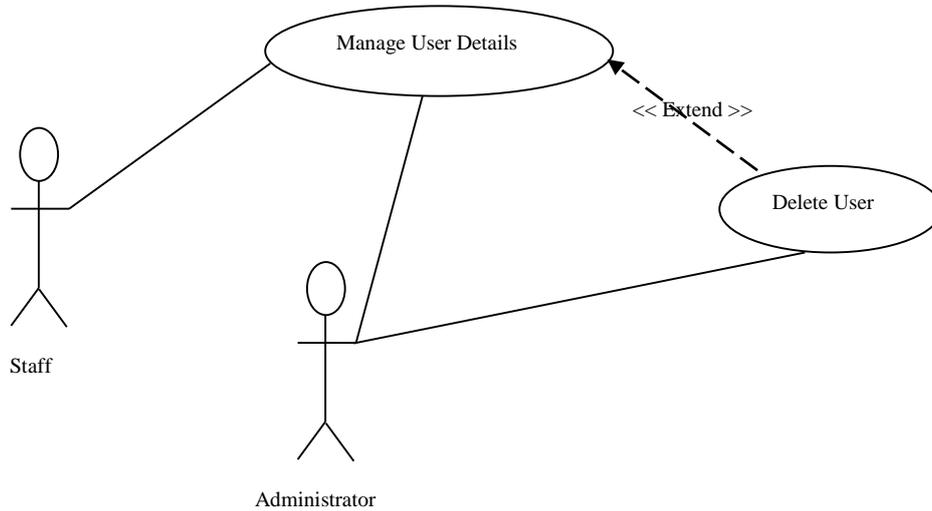


Figure 3-2: Use case diagram for Login of IMS

### 3.7.3 Context diagram

The Context Diagram shows the system under consideration as a single high-level process and then shows the relationship that the system has with other external entities (systems, organizational groups, external data stores, etc.).

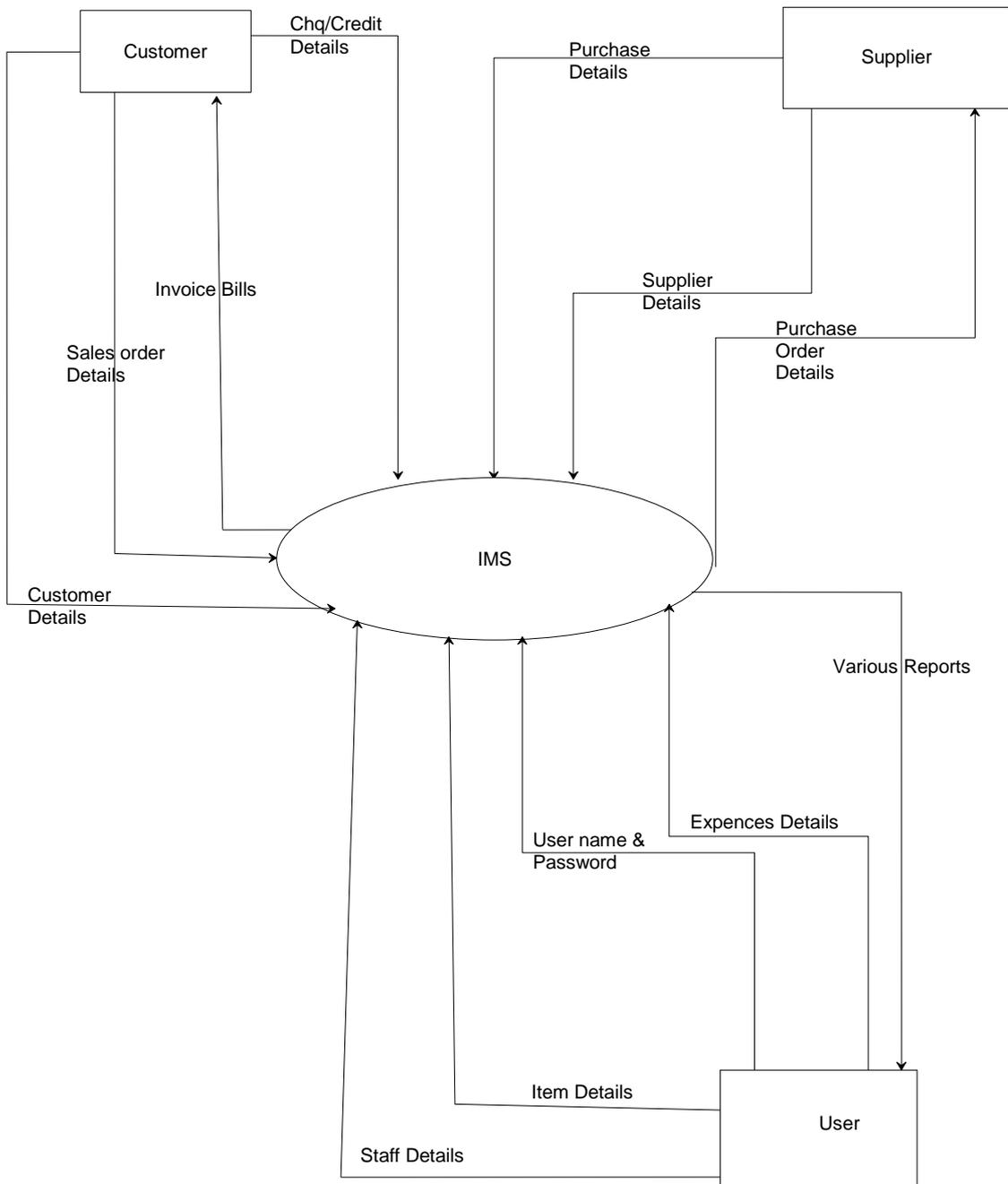


Figure 3-3: Context diagram of IMS

### 3.7.4 1<sup>st</sup> Level DFD

The first level DFD shows the main processes within the system. Each of these processes can be broken into further processes until reach pseudo code.

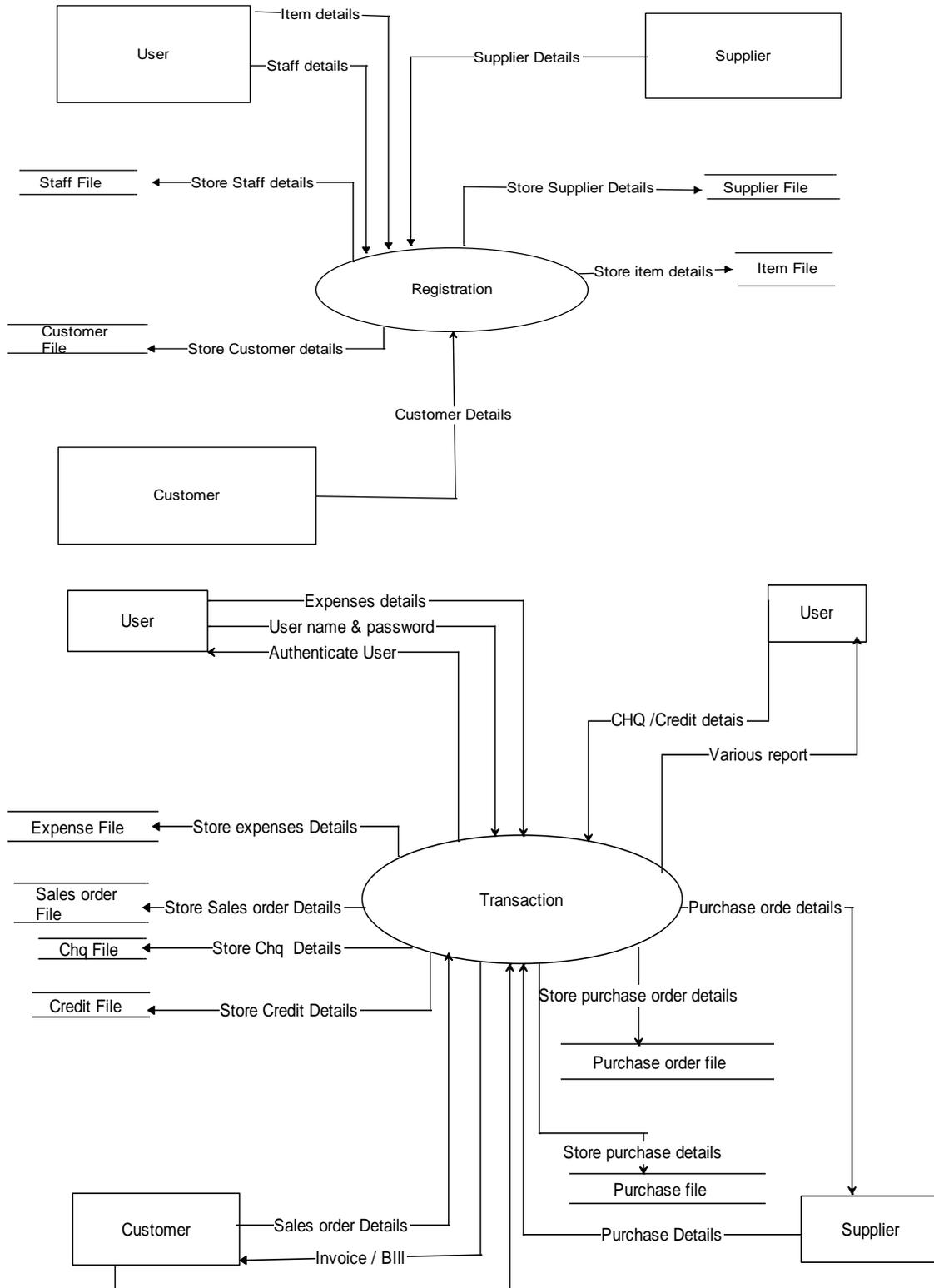


Figure 3-4: 1st Level DFD of IMS

### 3.7.5 Normalization

Normalization is a procedure of decomposing unacceptable relations into smaller relations. Purpose of the Normalization is to maintain consistence, Non redundancy and reduce data storage space of relations. There are several levels of Normalization.

#### First Normal Form (1NF)

First normal form (1NF) sets the very basic rules for an organized database:

- Eliminate duplicative columns from the same table.
- Create separate tables for each group of related data and identify each row with a unique column or set of columns (the primary key).

#### Second Normal Form (2NF)

Second normal form (2NF) further addresses the concept of removing duplicative data.

- Meet all the requirements of the first normal form.
- Remove subsets of data that apply to multiple rows of a table and place them in separate tables.
- Create relationships between these new tables and their predecessors through the use of foreign keys.

Table Name	Field Names
ChequeDetails	ChequeID, SalID, CusID, CusName, NetPayment, ChequeDate, ChequeNo, BankName, BranchName
CreditDetails	CreID, SalID, CusID, CusName, NetPayment, SalDate, CreDescription
Customer	CustomerID,FirstName,LastName,NICNo,Address,PhoneNo, EmailID
Login	UserName, Password, Usertype
Product	ItemCode, ItemName, Model, ModelNo, Discription, ProductCompany, ReOrder, SupplierID, SupplierName, Quantity, UnitPrice, SellingPrice
Purchase	PurchaseID, ItemCode, ItemName, Model, ModelNo, ItemDiscription, ProductCompany, Qty, PurchasePrice, SupplierID, SupplierName, PurchaseDate
PurchaseOrder	PurchaseOrderId, ProductCode, ProductName, Model, ModelNo, Quantity, PurchaseDate, SupplierID, SupplierName

SalesBill	SalBillNo, SalDate, CusID, CusName, Amount
SalesDetails	SalID, SalBillNo, SalDate, ItemCode, ItemName, Model, ModelNo, SerialNo, CusID, CusName, Price, Quantity, Discount, CashPayment, TotPrice, Balance
SalesOrder	SalesOrderID, ItemCode, ItemtName, Model, ModelNo, Quantity, CustomerID, CustmerName, OrderDate, SalesDate
Staff	StaffID, FirstName, LastName, NICNo, Sex, Address, DOB, Age, PhoneNo, WorkExperience, JoinDate
SupplierDetails	SupID,FirstName, LastName, NICno, Address, TelNo, Fax, EmailID
LoginFeedBack	LoginId, UserName, StaffID, LoginTime

Table 3-1 : 2<sup>nd</sup> Normal Form for IMS

### Third Normal Form (3NF)

- Third normal form (3NF) goes one large step further:
- Meet all the requirements of the second normal form.
- Remove columns that are not dependent upon the primary key.

## 3.8 Interface design

The proposed IMS system was completely explained by the requirement specification in the above section. The Data flow diagrams and flow charts are used to describe the system functionality. Following typical modules were identified.

1. Authentication module
2. Registration / Enter details module
3. Sales and marketing module
4. Purchase module
5. Tally the expenses module

### 3.8.1 Introduction on user Interface

A fundamental reality of application development is that the user interface is the system to the users. User interface design is important for several reasons. First of all the more intuitive the user interface the easier it is to use, and the easier it is to use and the less expensive to use it. The better the user interface the easier it is to train people to use it, reducing the training costs. The better user interface the less help people will need to use it, reducing the support costs. The better user interface the more users will like to use it, increasing their satisfaction with the work.

“Igor [ Igor Hawryszkieyez,2000] emphasizes the goal of user interface design is to provide the best way for people to interact with computers or what is commonly known as **Human Computer Interaction (HCI).**” There are two aspects to interface design. One is to choose the transaction in the business process to be supported by interfaces. This will define the broad interface requirements in terms of what information is input and output through the interface during the transaction. The second is the design of the actual screen presentation, including its layout, and in fact the sequence of screens that may be needed to process the transaction.

User interface design is a specification, which specifies the user – computer interaction method. The conventional style of user interface is command Line Interface (CLI). But now the most commonly used and popular user interface is graphical user interface (GUI). The user interface is designed to aspect the input from users and provides a well formatted output to the users.

### 3.8.2 IMS User Interface design

In the IMS system, graphical user interface design was used to create the interfaces. This system contains several interfaces according to the activities and processes involved. Main menu was designed in such a way that it provides easy and logical navigations throughout the system. The menu bar, tool bars and buttons are also used in this system. Further, shortcut keys and access keys were introduced for convenience. Utilities panel in the main window was provided to quick navigation for most commonly used interfaces in this system.

The system considers the factors like good look and feel start up position; alignments, icons, font color, font type, font size and tab order the user friendly environment of the system. Furthermore, panels and group boxes to achieve the consistency throughout the system. Further, user controls like textboxes, buttons, labels, checkboxes, option buttons, list view and data grids were suitably selected to enhance were used to group set of controls in logical manner.

### 3.8.3 Sample User Inter face of the IMS

- **Login Interface**

Login will ask users to select their user name and to enter their password. Only the system admin and user have the privileges to make any new logins.

With that, they can only delete an account or change username. Others can't delete an account or change user name. If the users does not enter correct password for selected user name they won't be able login to the system. After the user login to the system, the main interface is loaded.



Figure 3-5: Login Interface of IMS

- **Main Interface**

Once successfully logged into the system, the main interface of the system loaded. This contains menus with pull down sub menus, toolbar icons and button in utility panel for your quick access in order to perform various tasks of the system. The main menu also controls the facilities to restrict the access of unauthorized users.



Figure 3-6: Main Interface of IMS

- **Edit User Name or Password Interface**

Users can change their Password through this interface

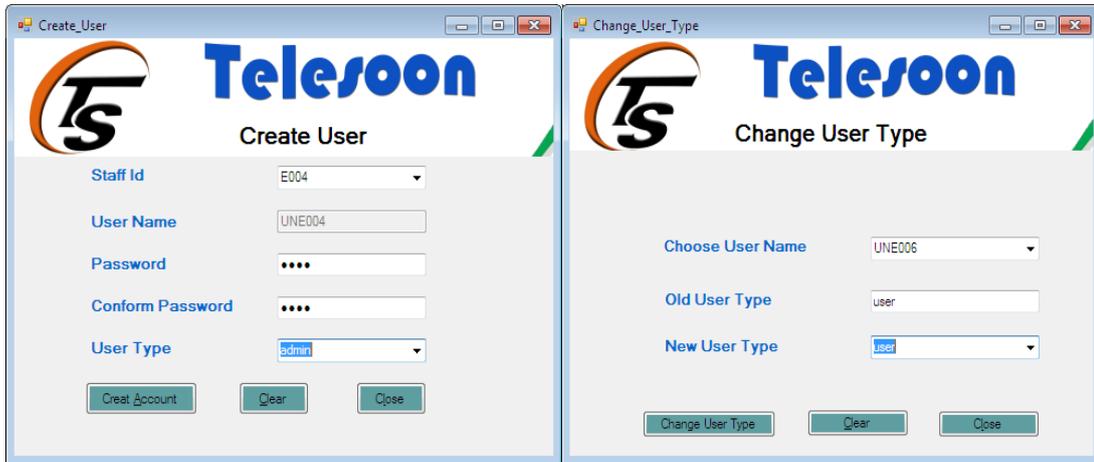


Figure 3-7: User Modification

- **Product Details Interface**

System user can enter a new record, delete a record, update a record, and search a record.

All current inventory items are entered before the system use.

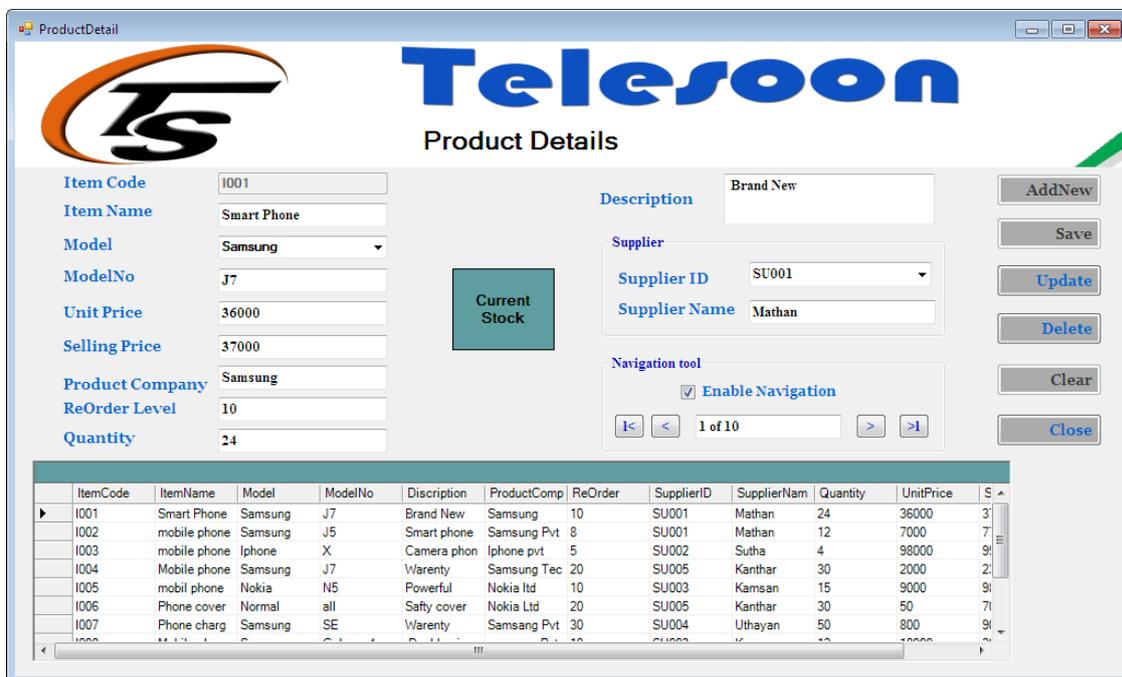


Figure 3-8: Product Details of IMS

- **Purchase Details Interface**

To add the purchased items for The Phone Shop, click on the “Purchase” button on the utility panel or go through *File – New – Purchase*. The following interface appears

Figure 3-9: Purchase Details of IMS

- **Sales Details Interface**

To sale the item of The Phone Shop, click on the “Sales” button on the utility panel or go through *File – New – Sale*. The following interface appears

Figure 3-10: Sales Details of IMS

# CHAPTER 4 : IMPLEMENTATION

## 4.1 Introduction

The scope of this IMS system is to deliver an efficient and effective Inventory Management system for The Phone Shop to handle the day to day transactions such as sales, inventory, and orders for purchase and generating timely, weekly, monthly, and yearly reports to give quick and quality services for their customers.

The implementation stage of software development is the process of converting the system specification into an executable system.

The purpose of System Implementation can be summarized as follows: making the new system available to a prepared set of users (the deployment), and positioning on-going support and maintenance of the system within the performing Organization (the transaction). At a final level detail, deploying the system consists of executing all steps necessary to educate the Consumers on the use of the new system, placing the newly developed system into production, confirming that all data required at the start of operations are available and accurate, and validating that business functions that interact with the system are functioning properly. Transitioning the system support responsibilities involves changing from a system development to a system support and maintenance mode of operation, with ownership of the new system moving from the Project Team to the performing Organization. A key difference between System implementation and all other phases of the lifecycle is that all project activities up to this point have been performed in safe, protected and secure environments, where project issues that arise have little or no impact on day – to – day business operations. Once the system goes live, however, this is no longer the case. Any miscues at this point will almost certainly translate in to direct operational and financial impacts on the performing Organizations. It is through the careful planning, execution, and management of System implementation activities that the Project Team can minimize the like hood of these occurrences, and determine appropriate contingency plans in the event of problem.

## 4.2 Implementation Environment in IMS

### 4.2.1 Programming language and the data base

The IMS can be stated as a Database Management system (DBMS), because it has collection of interrelated data and a set of programs to access that data. These programs were developed in Microsoft Visual Studio. The integrated development environment (IDE) of visual studio.net was very useful while developing interfaces.

The IMS project is used with Microsoft Visual Studio 2008 and SQL Server 2008 due to its popularity. Microsoft Visual Studio allows the user interface of the package to develop and incorporate applications that can run on the Micro Soft Windows XP platform (2002 or latest version). This application have the ability to provide a powerful, user friendly and pretty graphical user interface that have the possibility of exploiting typical, ease of use windows tools, if the developer wished this to be so. It allows any windows based package to have a virtually customized user interface, which can be standardized throughout the company, if desired. Microsoft Visual Studio also provides a tool that grants the application developer to display, edit and update any information residing in a wide range of existing database packages.

#### 4.2.2 The data base connectivity in the project

The Microsoft Visual Studio 2008 has several facilities to connect database, such as ODBC, ADO.Net. Here,

### 4.3 Data base Implementation

All computer programs share the databases when they are being tested after developed. So, to avoid future problems database implementation should be beginning first before program modules developed. The databases of the intended system are developed and tested at this phase. The major input of this activity is Database design specification. The production of this activity is a database structure with no data. The test data is also produced during this period and stored in project repository for future use.

### 4.4 Implementation Plan in the IMS

The implementation of new system includes

- Hardware installation
- Software installation
- Current inventory entering
- Staff Training

## Hardware installation

A personal computer with following configuration will be needed for the system hardware requirement.

<b>Processor</b>	Pentium III 1.2 GHZ or above
<b>Memory</b>	256 MB or above
<b>Hard disk space</b>	40GB or above (also for back up purpose)
<b>Input</b>	101/102 (USB/PS2) Keyboard & Optical/ normal mouse
<b>Out put</b>	Color monitor, Laser printer/ dot matrix printer
<b>Disk Drives</b>	CD writer or zip drive (for also back up purpose)
<b>Power</b>	UPS(600VA or above)

Table 4-1: Hardware Requirements

## Software installation

Following licensed software should be provided for the system software requirement.

- Windows 7
- Microsoft SQL server Enterprise edition 2008
- Crystal report (This available in .NET frame work)
- Microsoft Word 2007/2010

## Current inventory entering in the system

The Phone Shop all current inventory items details should be enter first before the system use. Anyhow the supplier details should be entering first before it. The accurate data should be provided here; otherwise it will increase the work load for inexperienced users.

## Staff training to use the system

The next important step concerned in the implementation process is staff training. The purpose of training is to eliminate the fear and misunderstandings surrounding the system, and to create a feeling of user involvement. This can be carried out efficiently by first giving consideration to the user's level of knowledge in computers. Likewise the staff can be divided accordingly.

### Methods of training will include:

- Give a lecture to users for overall understanding of the system.
- Give a computer-assisted training to the system users
- System users will also be provided with a user manual guide for quick reference.
- Allow the users to see the software when it is running in the show room with actual inputs.

## 4.5 Module Structure and Code

### 4.5.1 Module Structure of the TIMS

#### **Login form**

The User can enter the username and password through this interface. If the user enters wrong username or password the error messages will appear. This form has two buttons such as Ok and Cancel.

#### **Main window with menu**

This window is used to manage all the user requirement functionalities and it has Left panel and Menu bar (**Figure 4.1**).

##### **1. Left panel**

Left Panel divides in to two parts there are User information area, Quick Access panel.

##### **2. Menu Bar**

Left Panel divides in to nine parts there are Admin tools, Product, Purchase, Sales, Reports, Find, User account, Help and View.



Figure 4-1: Main Screen of System

## 4.5.2 Functions and Procedures of the IMS

### 1. **Autono() As String**

This function is used to display auto number when the user enters a new record. The table name and dataset name will vary with every interface.

Eg: `'auto number function`  
`Function autono() As String`  
`Dim LR As DataRow`  
`If (DataSet11.Tables("Product").Rows.Count = 0) Then`  
`Return ("I001")`  
`Else`  
`LR =`  
`DataSet11.Tables("Product").Rows(DataSet11.Tables("Product").Rows.Count -`  
`1)`  
`Return Format(Val(Mid(LR("ItemCode"), 2)) + 1, "\I000")`  
`End If`  
`End Function`

### 2. **Sub Main ()**

The sub procedure that is executed first when a visual basic program is run is the Main procedure.

The syntax of this procedure is

`Sub Main ()`

`'Code here`

`End Sub`

The Sub Main procedure is the starting point of every application. Every Visual Basic .Net application must contain a Sub Main procedure. All can include any initialization code that they might have in the Sub Main procedure, such as connection to a database or authenticating a user.

### 3. **Clear ()**

This function is used to clear the current record from every interface. These contents will vary with every interface.

Eg: `'clear procedure`  
`Public Sub clear()`  
`TxtItcode.Text = ""`  
`TxtItemname.Text = ""`  
`CmbModel.Text = ""`  
`TxtModelNo.Text = ""`  
`TxtDescription.Text = ""`  
`TxtItprocompany.Text = ""`  
`TxtReorder.Text = ""`  
`TxtQty.Text = ""`  
`TxtUnitprice.Text = ""`  
`TxtSellingprice.Text = ""`  
`End Sub`

This function is used to display the details in a List View. These contents also vary with every interface. This control is typically used to list items and this control Inherits directly from the Control class.

### 4.5.3 Major code Modules for IMS

#### 1. Code for welcome form

```
Private Sub Welcome_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
Label1.Text = "LOADING"
If Val(TimeString) < 12 Then Label2.Text = "Good Morning"
ElseIf Val(TimeString) < 16 Then Label2.Text = "Good After noon"
Else
Label2.Text = "Good evening" End If
End Sub
Private Sub Timer1_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer1.Tick
If ProgressBar1.Value <100 Then ProgressBar1.Value +=1
Else : Timer1.Enabled = False Dim log As New Login Me.Hide()
log.Show() End If
End Sub
Private Sub Timer2_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer2.Tick
Dim i As Integer
Dim a() = {"Checking System Configuration", "Checking Status",
"Checking UserStatus", "Checking database", "Please wait",
>Loading"}
Label1.Text = a(i) i += 1
If i = 6 Then
Timer2.Enabled = False Timer3.Enabled = True
End If End Sub
Private Sub Timer3_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer3.Tick
Label1.Text += "."
End Sub
```

#### 2. Code for Login form

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button1.Click
Dim i As Integer
For i = 0 To DataSet11.Tables("UserLogin").Rows.Count - 1 If
txtusername.Text =
DataSet11.Tables("UserLogin").Rows(i).Item(0) And txtpassword.Text
= DataSet11.Tables("UserLogin").Rows(i).Item(1) Then
MsgBox("Welcome to you As " &
DataSet11.Tables("UserLogin").Rows(i).Item(2))
Main.Show() Me.Hide()
Exit For End If
Next
If i = DataSet11.Tables("UserLogin").Rows.Count Then
MsgBox("Username and Password does not match")
EndIf End Sub
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button1.Click
```

```

Dim i As Integer
For i = 0 To DataSet11.Tables("UserLogin").Rows.Count - 1 If
txtusername.Text =
DataSet11.Tables("UserLogin").Rows(i).Item(0) And txtpassword.Text
= DataSet11.Tables("UserLogin").Rows(i).Item(1) Then
MsgBox("Welcome to you As " &
DataSet11.Tables("UserLogin").Rows(i).Item(2))
Main.Show() Me.Hide()
Exit For End If
Next
If i = DataSet11.Tables("UserLogin").Rows.Count Then
MsgBox("Username and Password does not match")
End If
Private Sub btncancel_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles btncancel.Click
SqlDataAdapter1.Fill(DataSet11, "UserLogin") txtusername.Text = ""
txtpassword.Text = "" End Sub
End Class

```

## 4.6 Acknowledgement of reused code

The above two `autono()` and `listview()` code were written with the help of previously BIT passed out students dissertation from the University Library of UCSC. So, it is customary to thank the UCSC and the BIT passed out students to help this system to generate some customized auto number and list view. As the source codes are with full comments, it was very useful to implement in this system. With that, Visual studio **MSDN** online code help also used in this effort. So, another thank to Microsoft for the help to produce the system [10].

# CHAPTER 5 : EVALUATION

## 5.1 Introduction to Testing Software

Testing is critically important to the success of any project that aims to deliver working software. Testing is a process used to help identify the correctness, completeness and quality of developed computer software. With that in mind testing can never completely establish the correctness of computer software [4].

There are many approaches to software approaches to software testing, but effective testing of complex products is essentially a process of investigation, not merely a matter of creating and following rote procedure. One definition of testing is “the process of questioning a product in order to evaluate it”, where the “questions” are things the tester tries to do with the product, and the product answers with its behavior in reaction to the probing of the tester. The quality of the application can and normally does vary widely from system to system but some of the common quality attributes include reliability, stability, portability, maintainability and usability. Testing helps in Verifying and Validating if the Software is working as it is intended to be working

- Verification – This is to find out whether the system is without errors
- Validation – This basically focuses on whether the system satisfies all the user requirements.

System that is without errors, but does not satisfy all the user requirements is known as a System Right. It is verified, but not validated. A system that is without errors and satisfies all the user requirements is known as a Right System. It is verified as well as validated. The verification and validation process (V & V) that the particular system will satisfy the customer requirements.

## 5.2 Software Testing Fundamentals

Testing objectives include.

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

Testing should be systematically uncovering different class of errors in minimum time and with a minimum amount of effort. A secondary benefit of testing is that it demonstrates. That the software appears to be working as stated in the specification. The data collected through testing can also provide an indication of the software's reliability and quality but testing cannot show the absence of defect – it can only show that software defects are present.

### 5.3 Types of Testing

#### **Acceptance Testing**

This is done by the customer to see whether the system is satisfying customer requirements given in the specification. When it satisfies user will accept the system and use it for the operational work in the business. In the IMS, it was achieved.

#### **System Testing**

Once the integration of the modules to get the final system is completed successfully checks whether the system is working properly as a whole during system testing. Some attributes such as performance, security, Robustness & Stress level were tested.

#### **Unit Testing**

During this stage each program module is tested to see whether it is performing its function properly .This is done by comparing the module enveloped with its specification. In the IMS it was tested successfully.

#### **Functional Testing**

Validating an application or web site confirms to its specifications and correctly performs all its required functions. This entails a series of tests which perform a feature by feature validating of behavior, using a wide range of normal and erroneous input data. This can involve testing of the product's user interface, APIs, database management, security, installation, networking, etc.

Functional testing can be performed on an automated or manual basis using black box or white box methodologies.

#### **Integration Testing**

In unit testing, focuses on the smallest unit of software design the module. Once each module has been tested, we can begin the integration of each module in an incremental manner.

Integration testing can proceed in a number of different ways, which can be broadly characterized as top down or bottom up testing. We have used bottom up testing where individual modules are tested. Once sets of individual modules have been tested they are then combined into a collection of modules, known as builds, which are then tested by a second test harness. This process can continue until the build consists of the entire system.

After the integration of modules have been completed and tested, we moved on to testing of the entire program, in which validation is tested. This is, in effect, testing of functional expectations, i.e. that the software works in the way that the imperial reasonably expects it.

Few of the factors that can be looked into are

- Modularity –the functional interdependence of the program.
- Operability- the ease of operation of the system.
- Security –the security mechanism that protects sensitive information.
- Simplicity –overall understanding of the program.
- Accuracy –accuracy of transmission of the sensitive information from data entry to saving it into the database.
- Efficiency – the run time efficiency of the performance.
- Error tolerance – the extent of damage that occurs.

The above mentioned black box testing have been shown in the test cases in detail. The objective is to determine the system's effectiveness.

It's important to high light whether the Test plans set up is capable to test all the parts of the software program and able to discover the errors. Thus the time taken to do the test coverage mean time failure of the program, time required to solve the defects and time required test the comparison.

### **White - box Testing**

White-box testing is also called structural testing. White Box Testing: knowing the internal workings of a product, tests can be conducted to ensure that "all the gears mesh", that is, that the internal operation of the product performs according to specification and all internal components have been adequately exercised. In white box testing, the software implementation itself is used to guide testing. A common white box-testing criterion is to execute every executable statement during testing, and verify that the output is correct for all tests. In the intense testing of our system, every decision outcome must be executed during testing.

A corresponding weakness is that if the software does not implement one or more requirements, white box testing may not detect the resultant errors of omission. Therefore, both white box and requirements-based testing are important to an effective testing process. All white box tests have the disadvantage that the program's source code is needed to run the tests.

### **Black - box Testing**

Black box testing, aims to test the program's behavior against its specification without making any reference to the internal structures of the program or the algorithms used. Therefore the source code is not needed the programs just get a certain input, and its functionality is examined by observing the output.

The tested program gets a certain input or the input is observed. Testing generates a certain output which is collected by a second interface. This result is then compared to the expected output which has been determined before the test.

Advantages of black box testing:

- Black box tests are reproducible.
- The environment the program is running is also tested.
- The invested effort can be used multiple times.

## 5.4 Testing Activities in IMS

The following testing activities are performed during the phase:

1. Requirement analysis
  - Determine correctness
  - Generate functional test data.
2. Design
  - Determine correctness and consistency
  - Generate structural and functional test data.
3. Programming / constructions
  - Determine correctness and consistency
  - Generate structural and functional test data
  - Apply test data.
  - Refine test data
4. Operation and Maintenance
  - Reset

## 5.5 Tests plan and Test cases

### 5.5.1 How Plan to your test

To plan your tests you should carry out a simple step by step planning process, as follows.

- List the things that you need to test. Document these as objectives or scenarios in a test plan.
- Decide what test data you will need to set up in order to test all the relevant conditions. Some of the data will be input data, and some will need to be the database before the test. Each set of data, designed to test one or more test conditions, is known as a test case. It is important to test every condition, or combination of data conditions, but as a minimum you should attempt to test valid data that are well within the normal range, invalid data and data that are on the boundary. For example, if in a unit you were testing the input of data into a field with a valid range of 1-10, you should probably test something like 0, 1,5,10 and 11
- Produce a script for each test, detailing the steps that you will need to carry out.
- Define the expected results.
- Set up the test data. At this point you should always take a copy of data, so that you can restore data and re-run the tests as necessary. It is inconceivable that all your tests will be successful first time. If you do not take copies of your test data, you will have to set the data up from scratch every time you re-run the tests. Test data can be generated in spreadsheets, input manually, or imported from existing systems.
- Conduct the tests, and document the actual results. [WWW7]

## 5.6 Testing with results

Test Complete generates detailed test logs of all the actions performed during automated test runs. The logs give you deep analysis of test results and help you quickly locate and fix errors.

<b>Test log No</b>	<b>Test Data</b>	<b>Purpose</b>	<b>Expected Result</b>	<b>Actual Result</b>
01	Select user name and enter the password	To test the access to the application with correct	Should display the main form	As expected
02	Enter user name as error instead of select it.	To test the access to the application With the incorrect username	Should display an error message	As expected
03	Enter password As wrong	To test the application with incorrect password	Should display the error message	As expected
04	Enter wrong confirm password when we create the new account	To test the feedback of the application if both password differ from the user	It should display the error message	As Expected
05	Click the close button	To close the program	Close the program	As expected
06	Click the Log in button	It check Authorization for changing the username and password	Should logon to the system to the main form	As expected
07	Click on the calculator toolbar button	To display the calculator	It should display calculator	As expected
08	Click on the notepad tool bar button	To display the notepad	It should display the notepad	As expected
09	Click on the user account tool bar button	To display the user account form	It should display user account the form	As expected

10	Click on the customer menu bar button	It should display the customer form	It should display the customer	As expected
11	Click on the Supplier menu bar button	To display the supplier form	It should display the supplier form	As expected
12	Click on the item menu bar button	To display the item form	It should display the item details form	As expected
13	Click on the staff menu bar button	To display the staff details form	It should display the staff form	As expected
14	Click on the purchase menu bar button	It should display the purchase form	It should display the purchase form	As expected
15	Click on the purchase order menu bar button	To display the purchase order form	It should display the purchase order form	As expected
16	Click on the sales menu bar button	To display the sales form	It should display the sales form	As expected
17	Click on the sales order menu bar button	To display the sales order form	It should display the sales order form	As expected
18	Click on the sales button	To display the sales form	It should display the sales form	As expected
19	Click on the purchase button	To display the purchase form	It should display the purchase form	As expected
20	Click on the find button	To display the find form	It should display find form	As expected
21	Click on the product button	To display the item form	It should display item form	As expected
22	Click on the Staff button	To display the Staff details form	It should display staff form	As expected

Table 5-1: Test log with testing results of IMS

## 5.7 Test data and Test results

Specially identified test data were used to execute the test scripts and were used to verify the expected results obtained. Some sample test results are given below.

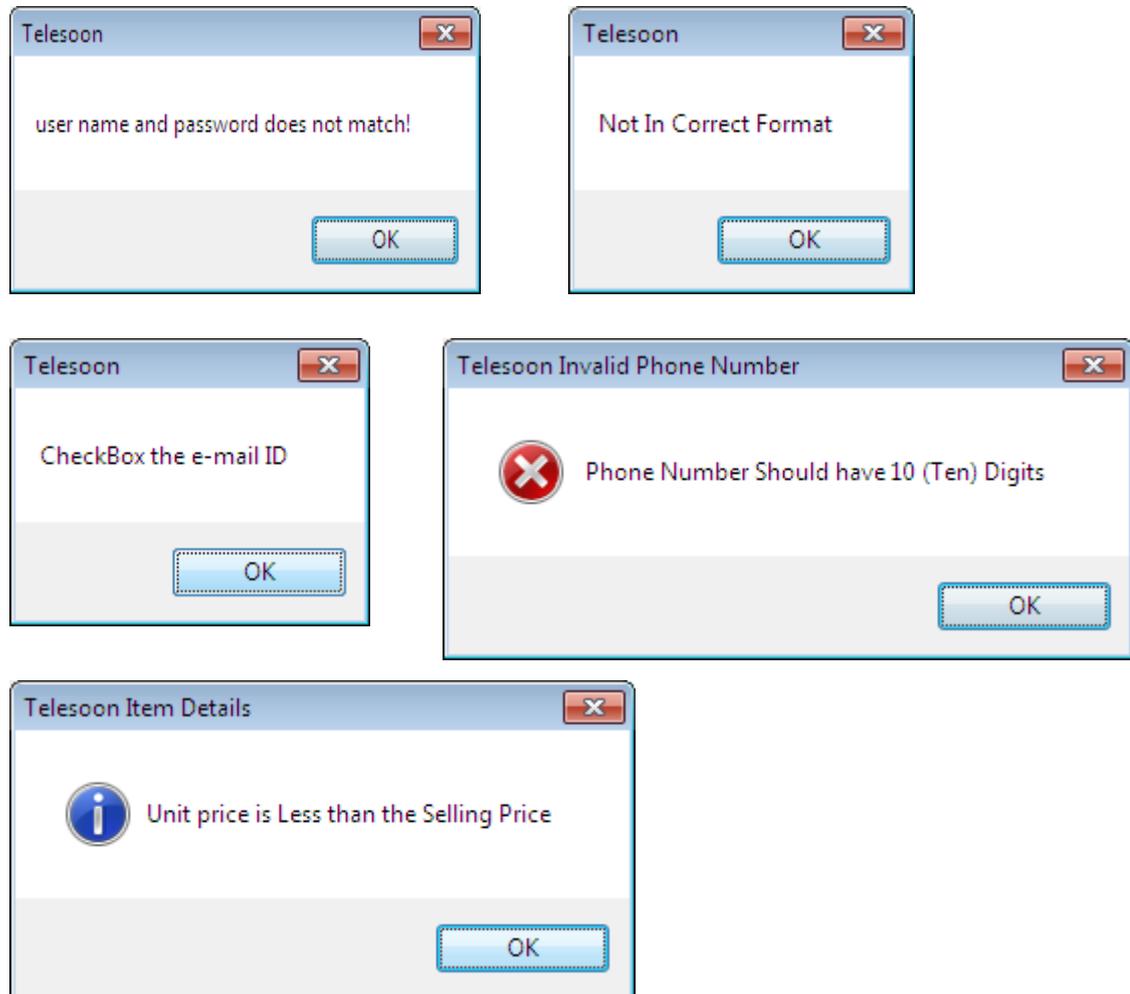


Figure 5-1: Test Result

Further information about test data and some of the relevant messages are provided in Appendix.

In the IMS System was tested in the real environment using real test data. The users of The Phone Shop were selected for test the functionalities of the system. Each category of user, a list of tasks was given to perform the functionalities. The test proved that the system was user friendly and can be employed in efficient and effective manner. Overall achievements of this project were agreeable and it was felt that all the objectives of the project have been met. The feedback from user testing was mostly positive with just a few suggestions for improvements. The feedback and suggestions given by the users helped to improve the software.

## 5.8 User Evaluation

The developed system is a single user system and customized specially for The Phone Shop. In future, a large scale system has to be developed to The Phone Shop. This will contain the multi user facilities. But now, it is an offline and single user system because of no branch.

No	Task	Satisfied?					
		Administrator		Staff		Customer	
		yes	no	yes	no	yes	no
1	Data insertion	✓		✓			✓
2	Data deletion	✓			✓		✓
3	Data updating	✓			✓		✓
4	Calculation	✓		✓			✓
5	View Report	✓		✓		✓	
6	Item distribution details	✓		✓		✓	
7	Details of staffs	✓			✓		✓
8	Details of Customer	✓		✓			✓
9	Details of Item	✓		✓			✓
10	Low quantity alert	✓			✓		
11	Generating reports	✓		✓			✓

Table 5-2: Evaluation

# CHAPTER 6 : CONCLUION

## 6.1 Critical functions of the project

In this section, reviewed all aspects of the proposed project carefully, whether all the objectives were achieved or not, the reasons for the unsuccessful objectives are discussed and analyzed. If there were any variations from the original objectives, it will also be discussed. Identifying the user requirements would be the very difficult part of this project. But it would be solved by using different fact finding methods. Inventory maintenance is also a critical aspect of the system, which is also achieved successfully.

The IMS system was a success project, because most of the objectives of the system were achieved. All the functional requirements of the proposed system were implemented effectively. Login to the system was successfully designed and implemented as required by the client and given the necessary security aspect to the system.

Inventory updating feature in the tabular format is also a required feature by the client, which were implemented according to the client's needs. Further, all the features available in the IMS system were verified and validated successfully. The reporting facilities available in the system were also a success, especially the weekly sales report, monthly sales reports expected from the managerial level users. This system is very helpful to overcome the problems in manual paper based system.

User-friendly interfaces of the system give good look and feel for users to work with relax mind and decrease the work load. The feedbacks regarding IMS system of users, after using this system are as follows:

- Its ability to assess large amount of data.
- It reduces data redundancy and increases integrity, which leads to efficiency in managing data and information.
- It's user-friendly.
- Its variety of reports facilities.
- It makes information available when needed.
- Its fast search facilities.

- Its suitable alert and message prompt facilities
- Its basic accounting facilities.

Not only it assists the decision making of the management but also speeds up the daily accounting work. To fulfill, this development should have the features of management information system.

The Classification on the information system does not imply that the real world computer systems must belong to only one category. Nevertheless, the effective management of the information is the key to the success of the today's organization. So, Inventory Management System is common to any organizations. But this dissertation describes the necessity, analysis and development of Inventory Management System for Telesoon Phone Shop.

Here, the item code was introduced by me and that was considered in the current inventories calculation of The Phone Shop. With that, variety of reports was introduced by me for the Store's accounting and decision making activities.

The project satisfies the Inventory management requirements of Telesoon Phone Shop and also satisfies the fundamental software standards. But some considerable facts may be failed to include at the end of the project. Any other income details and employee's EPF & ETF as in the requirement definition. These are also the client's wish. But it will not change the overall system functionality and quality.

Anyhow, it can be corrected in future. And the 95% of the project is success here. With that, the IMS has the database backup facilities for consistency and the variety of reports facilities for decision making. The developed system is a single user system and customized specifically for Telesoon Phone Shop.

## 6.2 Future development of IMS

The developed system is a single user system and customized specially for The Phone Shop. In future, a large scale system has to be developed to The Phone Shop. This will contain the multi user facilities. But now, it is an offline and single user system because of no branch.

The system can be improved in a number of ways by enhancing the functionality, such as giving a calculation for the seasonal discount for the item sales.

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# APPENDIX A. SYSTEM DOCUMENTATION

## Introduction

This section includes important information the user should read before installing IMS system version 1.0. It is use full to the user for installation and future maintenance.

It is implemented as an IMS for Telesoon Phone Shop, to maintain the Inventory management. This phone shop contains most of the famous company's Phones and phone related items. And this includes the inventory management, purchase, sales, expenses and some basic accounting details. I am to implement very secure system to control unauthorized access to the system or to avoid hacking of information from the system. Through this system the user can save lots of time and can find data with less human efforts. It was planned to provide very user friendly system by me to my client. Though, a non-computer literate person should be able to handle my system. Concerning this primary consideration my system validates each and every interaction of the user and helps them with appropriate message. It provides effective services to maintain day to day transactions and inventory management of The Phone Shop and obtain customized reports. It also has database backup facilities and dynamic help (F1 help) facilities to the user.

## System requirements

For development

- Microsoft Visual Studio 2008
- Microsoft SQL server 2008
- Crystal Report (This is available in .NET Framework)

For Implementation

- Microsoft Windows 07
- Microsoft SQL Server 2008
- Microsoft Visual Studio 2008

## Hardware Requirements

- Pentium IV
  - 128 MB or Higher RAM
  - 20GB or Higher Capacity Hard Disk
  - Key board and Mouse
  - Color Monitor, Laser Printer/ Dot-Matrix printer
  - CD writer or ZIP drive
  - UPS

## **Installation of IMS Software**

This installation is suitable for Windows XP

- First, close all applications running on your PC
- Insert the IMS CD Rom into the CD drive.
- Open the CD drive and open the IMS folder
- Find the setup.exe or IMS windows installer package file and double click it to open
- The installation wizard will be appearing on the screen.
- Name the location to place the system.
- After complete of installation, restart the computer. (Recommended)
- Now, the user can run the system via start menu as well as desktop.
- The user has to wait while the system gets loaded.

1. IMS System installation Steps in details.
2. Figure A. 1 Windows Installer of IMS
3. Windows Installer of IMS Setup wizard
4. Windows Installer of IMS Folder Selection wizard
5. Windows Installer of IMS Confirm installs
6. Windows Installer of IMS Installing

# APPENDIX B. DESIGN DOCUMENTS

## Application diagram

In Application Designer, can define, configure, and connect applications that provide or use services.

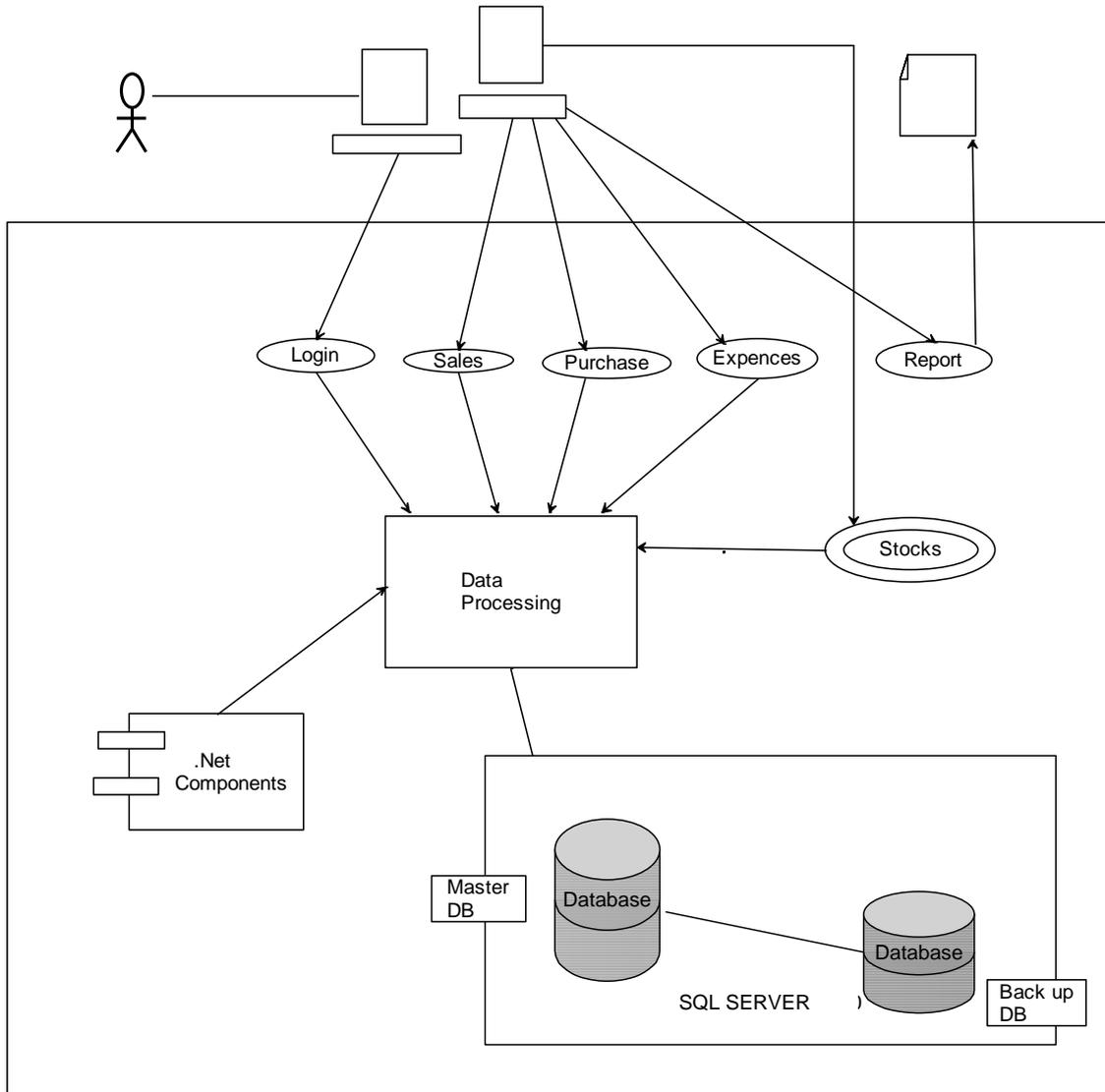


Figure B-1: Application diagram of IMS

## Context diagram

The Context Diagram shows the system under consideration as a single high-level process and then shows the relationship that the system has with other external entities (systems, organizational groups, external data stores, etc.).

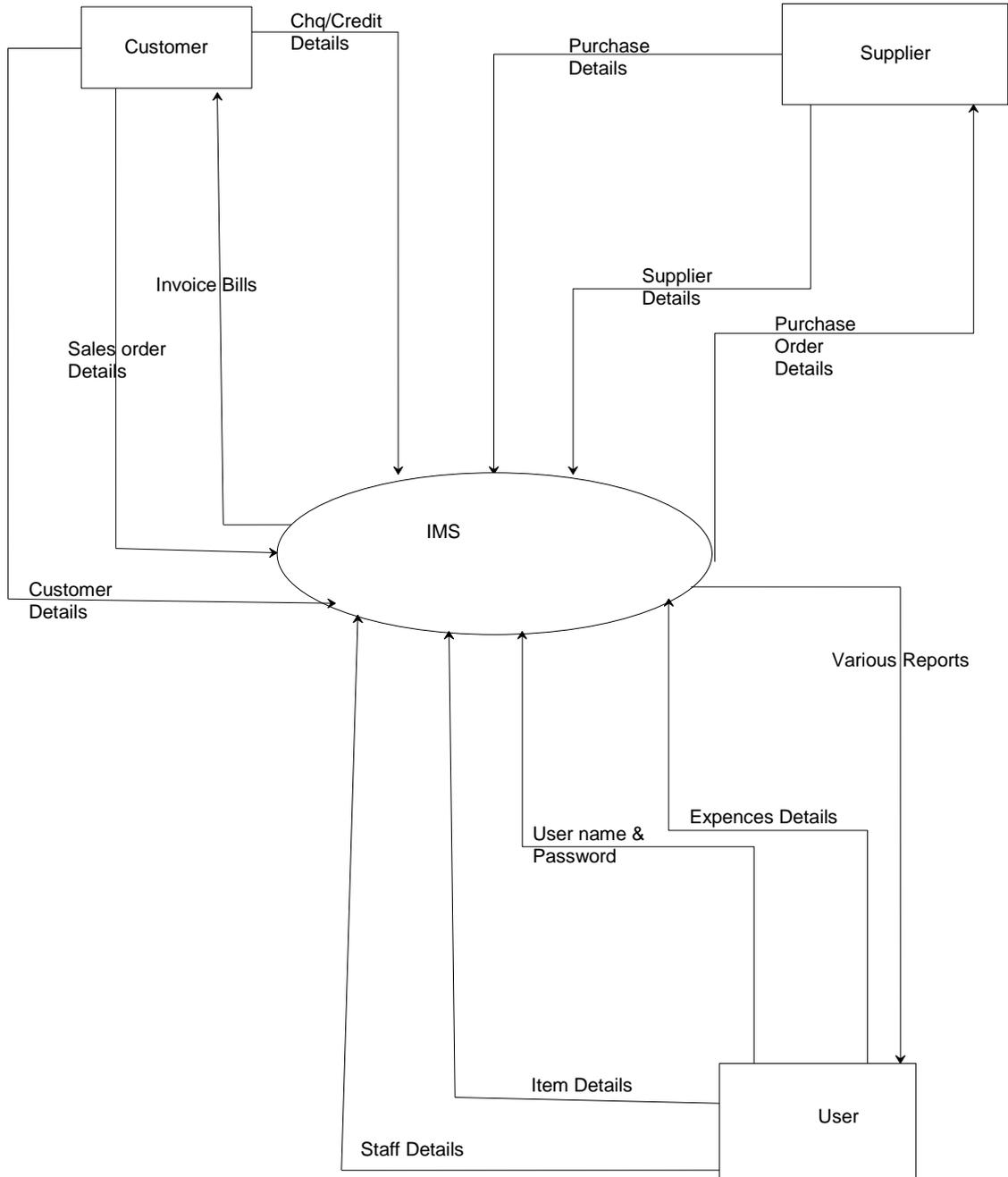


Figure B-2: Context diagram of IMS

## Relationship Diagram

An entity relationship diagram is a graphical representation of an organization's data storage requirements.

Entity relationship diagrams are abstractions of the real world which simplify the problem to be solved while retaining its essential features

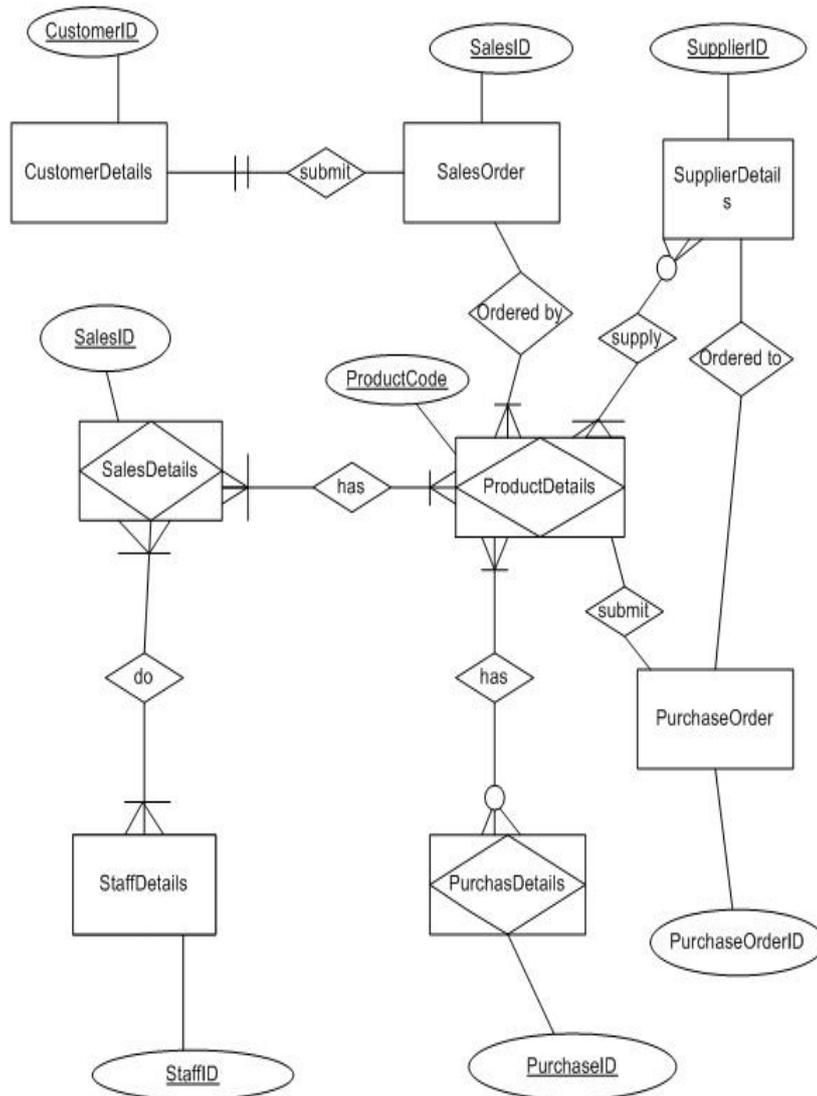


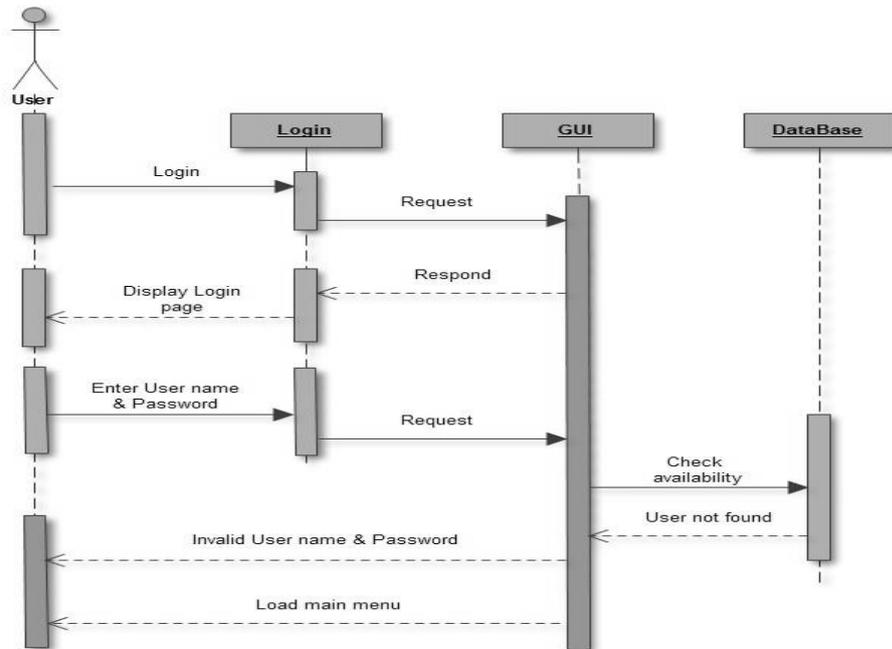
Figure B-3: ER Diagram of IMS

Note: Here only the Primary keys are shown in the above diagram **Entity**

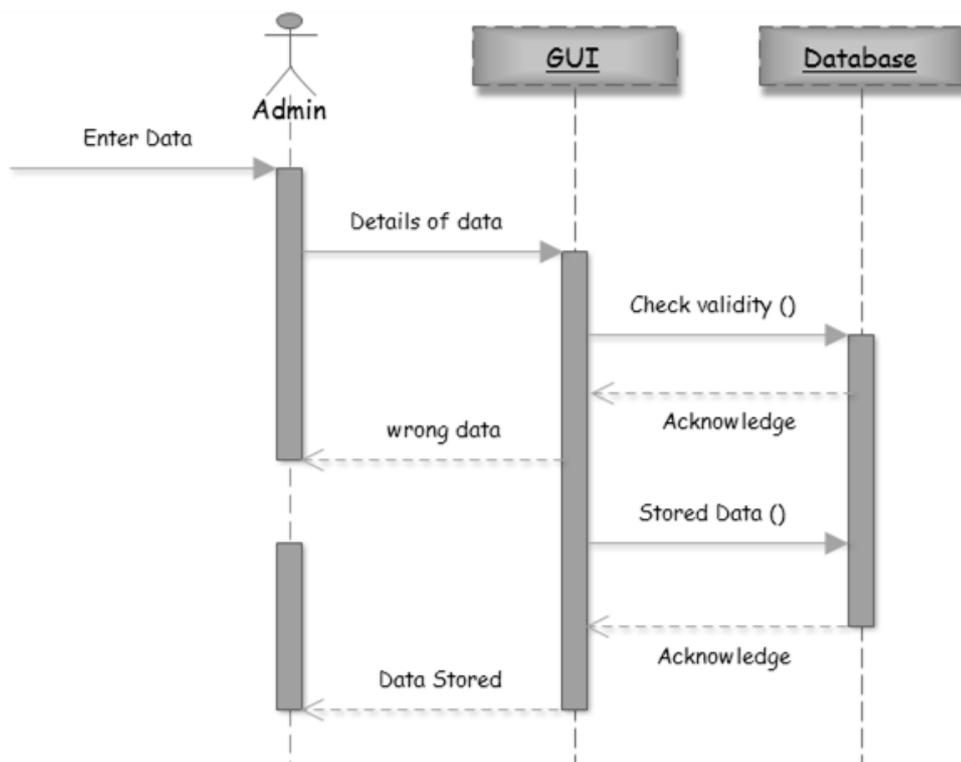
## Sequence Diagram for TIMS

Sequence diagram show how several objects collaboration in single use case. This is most widely used interaction diagram. Arrows illustrate the flow of control. The above sequence diagrams are sample Diagrams for user understandings (**Figure B.4**).

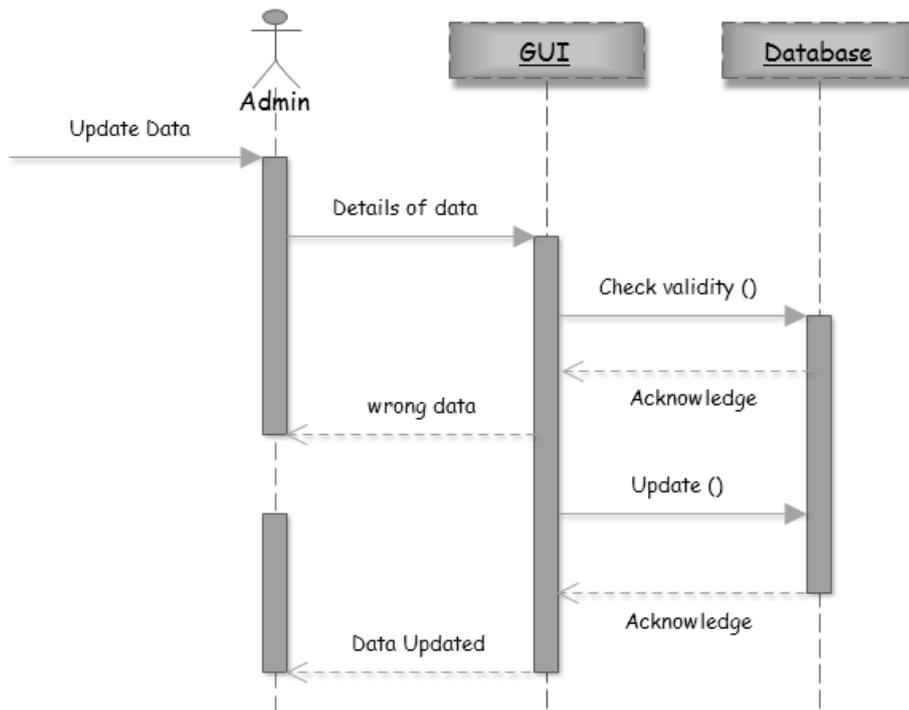
### User login



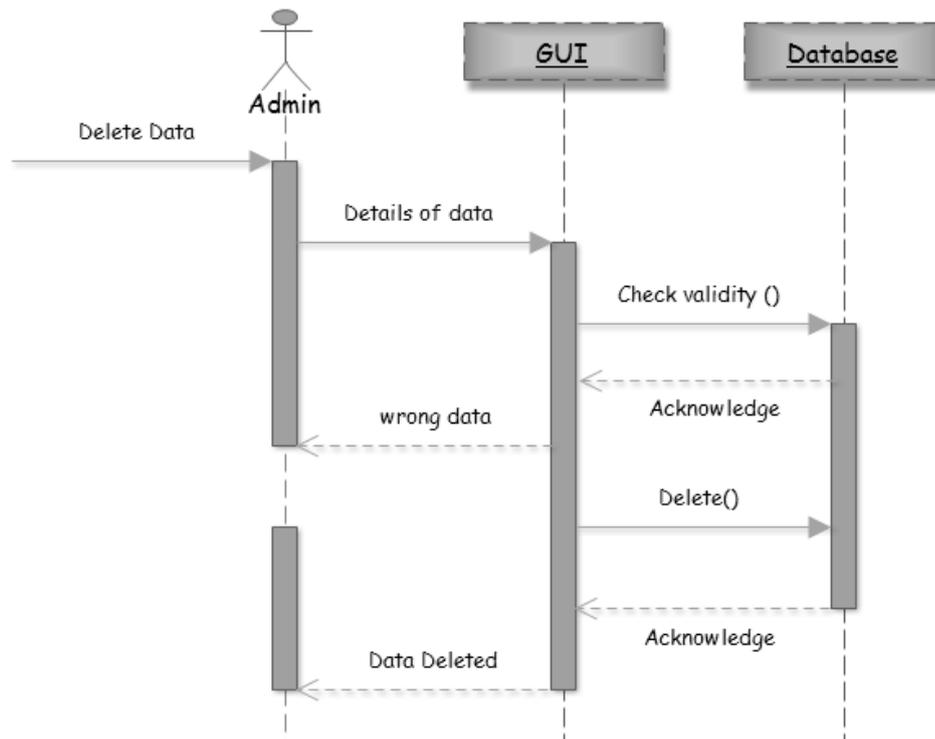
### Adding data



### Update the data.



### Delete the data.



## Generating reports

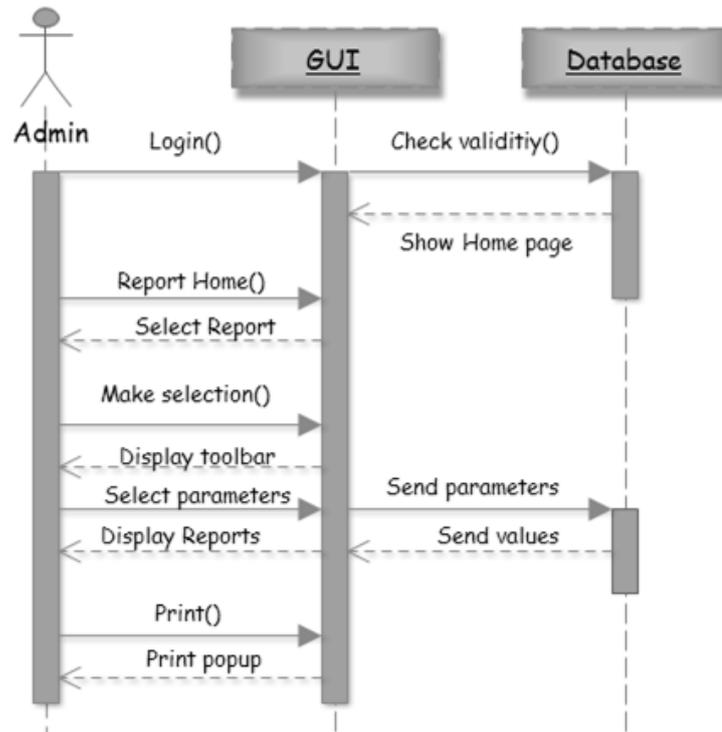


Figure B-4: Sequence Diagram

# APPENDIX C. USER DOCUMENTATION

## Introduction

This document is prepared to guide the users of the Inventory Management System for Telesoon Phone Shop, with appropriate user friendly screen shots explanations. This describes step by step operational guidelines of this system to the users. Most of the interfaces contain add new, save, update, delete, and navigation facilities. This user documentation covers all the aspects with selected interfaces of the developed system. Further information is available regarding the system in the help menu. Therefore refer the help facilities provided in the system to get more help when using this system.

## How to use the System?

- After the installation of IMS Software, it will create the shortcut on the desktop.
- Double click on it, then could be able to access the system.
- Then the welcome interface displays, after that, login interface displays.

## Login to the System



Figure C-1: User Login

Login will ask users to enter their user name and their password. Only the system Administrator and Owner have the privileges to make any new Logins. With that, they can only delete an account or change user name. Others cannot delete an account or change user name.

If the users does not enter correct password for selected user name they won't be able to login to the system. Then, the user has to discuss with the system administrator to make any amendment to that particular login. It contains suitable user friendly messages to the user. If the user enters incorrect password as 3 times, the system will automatically close with access denied message.

**Note:** According to the logins the access level amendment is restricted. Therefore it provides more security to the system.

After the user login to the system, the Main interface is loaded.

File menu contains the sub menu items to perform actions such as: new, open and close. Edit menu contains the sub menu item such as User registration, cut, delete, copy and paste. View menu contains available stock, reorder levels and registered users.

Then the tools menu contains calculator, notepad, explorer, search, users, database backup and exit.

The utility panel in the main interface contains the important activities of application, which are very helpful to the users, for their quick and easy access of the facilities they want to do.

The system user can do all the activities through the appropriate buttons, toolbar buttons and menu bar. Also the user can do their activities by using appropriate shortcut keys of menu item or by pressing Alt + 'underscore character' of buttons.

## Main Interface

Once successfully logged in to the system, the Main interface of the system is loaded. This contains menus with pull down sub menus, toolbar icons and utilities panel for the quick access in order to perform various tasks of the system. The Main Menu also controls the facilities to restrict the access of the unauthorized users.



Figure C-2: Main Interface

File menu contains the sub menu items to perform actions such as; new, open and exit. Edit menu contains the sub menu items such as user registration, delete purchase, and delete sales. View menu contains sub menu items such as reports, available stocks re-order level and registered users.

Then the tools menu contains calendar, calculator and IMS database backup. Help menu contains sub menu items such as IMS Help, Search and about IMS.

The utility panel in the main interface contains the important activities of the application, which are very helpful to the users, for their quick and easy access of the facilities they want to do.

The system user can do all the activities through the appropriate buttons, toolbar buttons and menu bar. Also the user can do their activities by using appropriate short cut keys of menu items or by pressing Alt + 'underscore character' of buttons.

### Create New User

To create a new user click on the User Accounts button on the utility panel or go through Tools – User Accounts. Then create a new user.



The screenshot shows a window titled "Create\_User" with the Telesoon logo and "Create User" text. The form contains the following fields and controls:

- Staff Id:** A dropdown menu showing "E004".
- User Name:** A text input field containing "UNE004".
- Password:** A text input field with masked characters (dots).
- Conform Password:** A text input field with masked characters (dots).
- User Type:** A dropdown menu showing "admin".

At the bottom of the form are three buttons: "Creat Account", "Clear", and "Close".

Figure C-3: Create User

## Product

To add a new item to the item table, click on the “Items” button on the utility panel or go through Item. The following interface appears.

ItemCode	ItemName	Model	ModelNo	Discription	ProductComp	ReOrder	SupplierID	SupplierNam	Quantity	UnitPrice
1001	Smart Phone	Samsung	J7	Brand New	Samsung	10	SU001	Mathan	24	36000
1002	mobile phone	Samsung	J5	Smart phone	Samsung Pvt	8	SU001	Mathan	12	7000
1003	mobile phone	Iphone	X	Camera phon	Iphone pvt	5	SU002	Sutha	4	98000
1004	Mobile phone	Samsung	J7	Warenty	Samsung Tec	20	SU005	Kanthar	30	2000
1005	mobil phone	Nokia	N5	Powerful	Nokia ltd	10	SU003	Kamsan	15	9000
1006	Phone cover	Normal	all	Safy cover	Nokia Ltd	20	SU005	Kanthar	30	50
1007	Phone charg	Samsung	SE	Warenty	Samsang Pvt	30	SU004	Uthayan	50	800

Figure C-4: Product Details

## Suppliers' Details

SupID	FirstName	LastName	NICno	Address	TelNo	Fax	EmailID
SU001	Mathan	Mathanann	832547978V	N031, Alady,	0215287932	0215287932	mayhan@gm
SU002	Sutha	Karan	789034567V	Raja veethi,	0772345670	0212231253	sutha@gmail.
SU003	Kamsan	Maran	894567840V	Karanthan,	0212234523	0212234523	maran12@g
SU004	Uthayan	Jana	874567430V	Uduvil,	0212051181	0212051181	uthayaja@gm
SU005	Kanhar	Ingaran	789087345V	Nallur,	0213456709	0213456709	ingaran@gm

Figure C-5: Suppliers' Details

## Search

To Search the information, direct users to go to ‘search’ button on the tool bar or go through **View – Search**. By using this, user can find the data from the tables’ which are listed on the combo list such as item code, item name, category and manufacturer. The data filtered from the tables according to the selection criteria given by the users.

Figure C-6: Search Details

## Sales Order details

To sale the item of The Phone Shop, click on the “Sales Order” button on the utility panel.

Figure C-7: Sales Order

## Staff details

To sale the item of The Phone Shop, click on the “Staff” button on the utility panel

StaffID	FirstName	LastName	NICNo	Sex	Address	DOB	Age	PhoneNo
E001	Ranjith	Kumar	842125479V	Male	Thirunalvely,	8/25/1984	33	077825498
E002	Vishnu	Kanthan	893456780V	Male	Nallur temple	5/1/1989	28	077505132
E003	Anne	Nirojini	895942570V	Female	Station rd,	6/6/1989	28	077498717
E004	Thusi	Tharsan	784563930V	Male	Kondavil Wes	2/22/1978	39	071235480
E005	Kugan	Robin	793967870V	Male	Point Pitto,	1/19/1979	38	077345692
E006	Aarun	Nila	833942580V	Male	Iirupallai Sout	9/28/1982	35	077564320
E007	Yogan	Maari	853452780V	Male	Neervely Sout	5/5/1986	31	077345628

Figure C-8: Staff Details

# APPENDIX D. MANAGEMENT REPORTS

## Introduction

Reports are used to make a decision about any organization. This process enables the system user to generate a view reports, timely, weekly and monthly summary reports. With that the user can create show room's income report. These reports are used for printing purposes and show room's future decision makings.

This can be done through the **Main** screen (interface) of the system. And user can also print his report as easy. Here, the most of Report generation can be done through the Report Menu of the Main interface.

To view the reports another way is, go through Report on the main menu bar and select the report name and get that report.

## Sample Reports

### 1. Staff Details Report

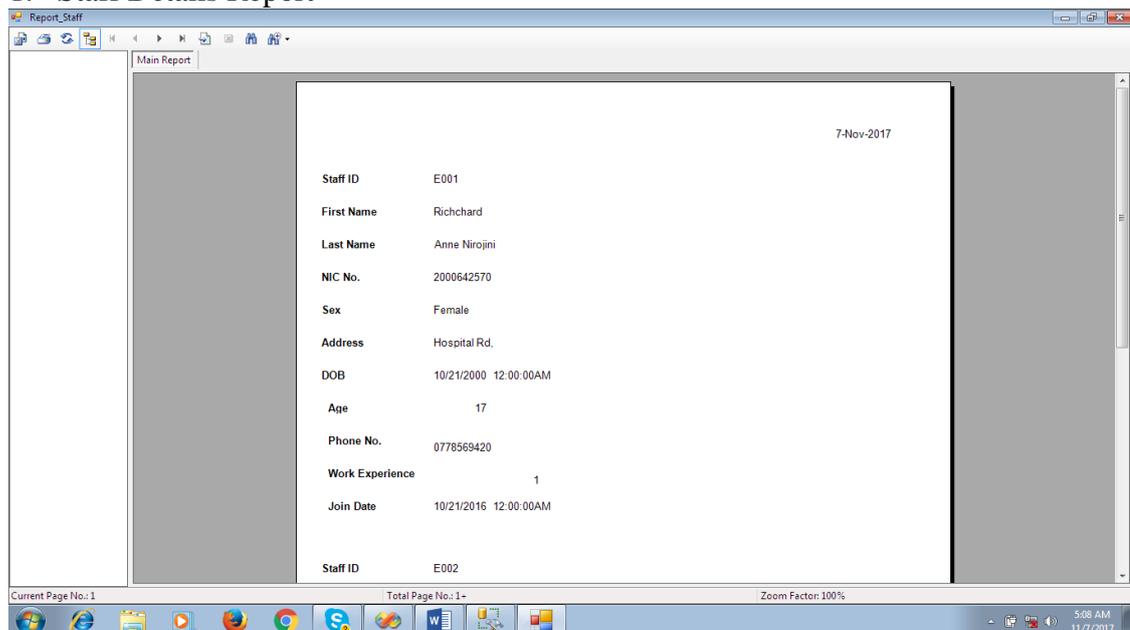


Figure C-1: Staff Details Report

The above report is used to have all the staff details of the Phone Shop. This can be printed through Report menu of the Main interface

## 2. Product Details Report

12/9/2017

**Product Details**

ItemCode	ItemName	ProductCompany	SupplierID	Quantity	UnitPrice	SellingPrice
I001	Smart Phone	Samsung	SU001	24	36,000.00	37,000.00
I002	mobile phone	Samsung Pvt	SU001	12	7,000.00	7,700.00
I003	mobile phone	Iphone Pvt	SU002	1	98,000.00	99,500.00
I004	Mobile phone br	Samsung Technologies	SU005	36	2,000.00	2,300.00
I005	mobil phone	Nokia Ltd	SU003	15	9,000.00	9,800.00
I006	Phone cover	Nokia Ltd	SU005	30	50.00	70.00
I007	Phone charger	Samsang Pvt	SU004	50	800.00	900.00
I008	Mobile phone	samsang Pvt	SU003	12	18,000.00	20,000.00
I009	Phone battery	Huawei Technologies	SU006	15	1,800.00	2,000.00
I010	Mobile Phone	Sony	SU007	10	50,000.00	52,000.00

Current Page No: 1      Total Page No: 1      Zoom Factor: 100%

Figure C-2: Product details

## 2. Customer Details

12/9/2017

**Telesoon**  
Customer Report

Customer ID	First Name	Last Name	NIC No.	Address	Phone No.	Email ID
C0001	Umaa	Suthan	774689540V	Kopay South, Jaffna	773422635	suthan77@gmail.com
C0002	Kava	Mugan	904567390V	Dutch Rd, Irupalai	212231253	kmugan23@yahoo.com
C0003	Yarl	Santh	903456890V	Kalvinkadurd, Jaffna	212231134	yarlsanth@gmail.com
C0004	Roshan	Denen	894635270V	Kokuvilsouth, Jaffna	773456900	denen123@hotmail.com
C0005	Loaan	Sugir	872978450V	Kaddappiraird, Jaffna	774567450	suga@yahoo.com
C0006	Rai	Mohan	904567834V	Uruthirapuram Kilinochchi,	712345902	mohanraj@gmail.com
C0007	Patheesh	Kumar	785438908V	Chunnaqam, Jaffna	779293900	patheesh@yahoo.com
C0008	Uma	Shankar	824537890V	Kokuvil East, Jaffna	775051327	purnashankar@plc.lk
C0009	Kaia	Laxman	926734509V	Kaithadi East, Jaffna	754378990	kajalaxman@gmail.com
C0010	Para	Paran	834569670V	Atchulu, Neervely	712345890	paraparan5@gmail.co

Current Page No: 1      Total Page No: 1      Zoom Factor: 100%

Figure C-3: Customer details

# APPENDIX E. TEST RESULTS

## Introduction

Various Kinds of tests cases and test results, conducted, are provided in chapter 5. Both positive and negative measures were taken into consideration to minimize the errors.

All the aspects of the system have been tested and identified specifications have been met. Many erroneous and difficult situations were avoided by disabling user controls suitably, providing help facility, providing appropriate message boxes, etc...

In this section some more test results, in the form of message boxes are provided.

## Enter an invalid User name or Password

When the user name and password enters, the system accepts correct login details; otherwise the following error message displays.

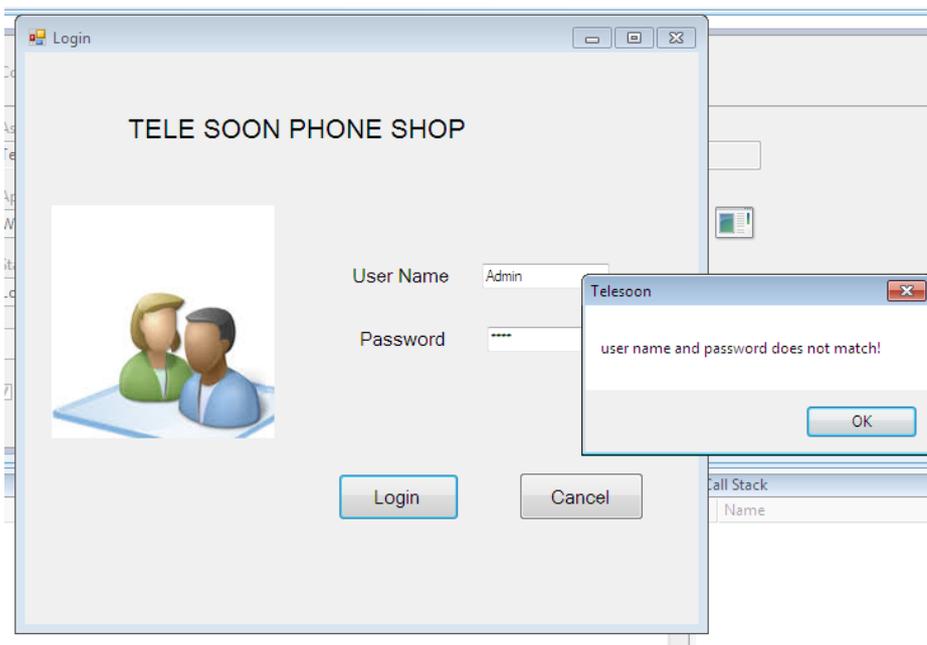


Figure C-1: To enter missing Data

## Quantity validation

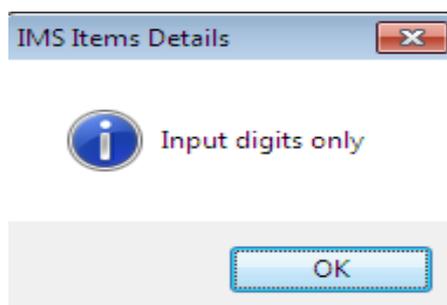


Figure C-2: Quantity validation

# APPENDIX F. CODE LISTING

## Introduction

Some of the selected codes from the important coding components are listed in this section. In order to provide them in an effective way, only some interesting code sections are included.

Refer the CD for the coding of the entire systems Codlings

## Here are some of the important code parts of IMS

To see the full code refer to CD.

### 1) Login form ' Login button click

```
Private Sub BtnLogIn_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles BtnLogIn.Click
```

```
    Dim i As Integer
```

```
    For i = 0 To DataSet11.Tables("LogIn").Rows.Count - 1
```

```
        If TxtUName.Text = DataSet11.Tables("LogIn").Rows(i).Item(0) And
        TxtPassword.Text = DataSet11.Tables("LogIn").Rows(i).Item(1) Then
```

```
            MsgBox("Welcome you as" & DataSet11.Tables("LogIn").Rows(i).Item(2))
```

```
            Main.Show()
```

```
            Me.Hide()
```

```
            Exit For
```

```
        End If
```

```
    Next
```

```
    If i = DataSet11.Tables("LogIn").Rows.Count Then
```

```
        MsgBox("User Name and Password does not match!")
```

```
        TxtUName.Clear()
```

```
        TxtPassword.Clear()
```

```
    End If
```

```
End Sub
```

### Login cancel Click

```
Private Sub BtnCancel_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles BtnCancel.Click
```

```
    SqlDataAdapter1.Fill(DataSet11, "LogIn")
```

```
    TxtUName.Text = ""
```

```
    TxtPassword.Text = ""
```

```
End Sub
```

### Main's Toolbar button click

```
Private Sub ToolBar1_ButtonClick(ByVal sender As System.Object, ByVal e As System.Windows.Forms.ToolBarButtonClickEventArgs) Handles ToolBar1.ButtonClick
```

```
    Select Case e.Button.ImageIndex
```

```
        Case 0
```

```
            Shell("Notepad.exe", AppWinStyle.NormalFocus)
```

```
        Case 1
```

```
            Shell("Calc.exe", AppWinStyle.NormalFocus)
```

```
        Case 2
```

```
            Dim Sea As New Search
```

```
            Sea.Show()
```

```
        Case 3
```

```
            Try
```

```
                Shell("C:\Program Files\Internet Explorer\IEXPLORE.EXE", vbMaximizedFocus)
```

```
            Catch ex As Exception
```

```
                MsgBox("Sorry!, couldn't load....." & vbCrLf & "Though, TELESOON searching...", MsgBoxStyle.Information, "TELESOON")
```

```
                Process.Start("about:blank")
```

```
            End Try
```

```
        Case 4
```

```
            MsgBox("Press F1 or Click on Help menu", MsgBoxStyle.MsgBoxHelp, "TELESOON")
```

```
        Case 5
```

```
            If MsgBox("Are you sure to logout?", MsgBoxStyle.YesNo, "TELESOON") = MsgBoxResult.Ok Then
```

```
Me.Close()
```

```
End If
```

```
Case 6
```

```
If MsgBox("Do you want to exit from this system?", MsgBoxStyle.YesNo, "The  
Phone Shop, Manipay") = MsgBoxResult.Yes Then
```

```
NotifyIcon1.Visible = False
```

```
Dim shut As New Shutdown
```

```
shut.Show()
```

```
Me.Hide()
```

```
End If
```

```
End Select
```

```
End Sub
```

### Main form closing

```
Private Sub Main_Closing(ByVal sender As Object, ByVal e As  
System.ComponentModel.CancelEventArgs) Handles MyBase.Closing
```

```
NotifyIcon1.Visible = False
```

```
Dim ask As String
```

```
ask = MsgBox("Do you want to exit from this system?", MsgBoxStyle.YesNo, "The Phone  
Shop, Manipay")
```

```
If ask = MsgBoxResult.No Then
```

```
e.Cancel = True
```

```
Exit Sub
```

```
Else
```

```
Me.Hide()
```

```
Dim shut As New Shutdown
```

```
shut.Show()
```

```
End If
```

```
End Sub
```

### ‘to display the Delete purchase in the Main form’s menu bar

```
Private Sub MenuItem25_Click(ByVal sender As System.Object, ByVal e As  
System.EventArgs) Handles MenuItem25.Click
```

```

If TextBox1.Text = "a" Or TextBox1.Text = "b" Then
    Dim Delpur As New Delete_Purchase
    Delpur.Show()
Else : MsgBox(" Sorry! You do not have the proper priviledge level to use it.",
MsgBoxStyle.Information, "The Phone Shop, Manipay")
End If
End Sub

```

### Other interface's important code parts

#### 2) Function autoNo() code

This is used to display a specific number as automatically when user click on Add new button or menu

#### To define a function as string

```
Function autoNo() As String
```

#### To declare a data row to customer details table

```
Dim LR As DataRow
```

#### If there is no records in the table

```
    If (DataSet11.Tables("Customer").Rows.Count = 0) Then
```

#### To display the first record's id as like as below

```
Return ("C0001")
```

```
    Else
```

#### To display the next new record's number by adding 1

```
LR = DataSet11.Tables("Customer").Rows(DataSet11.Tables("Customer").Rows.Count - 1)
```

```
Return Format(Val(Mid(LR("CustomerID"), 2)) + 1, "\C0000")
```

```
    End If
```

```
End Function
```

#### button New click

```
Private Sub BtnNew_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles BtnNew.Click
```

```
    flag = 1
```

```
    BtnNew.Enabled = False
```

```
    BtnSave.Enabled = True
```

```
    BtnClear.Enabled = True
```

```
TxtCustID.Text = autoNo()
```

```
TxtFName.Focus()
```

```
End Sub
```

**‘to clear text boxes and combo boxes as define in the clear function**

```
Public Sub clear()
```

```
TxtCustID.Text = ""
```

```
TxtFName.Text = ""
```

```
TxtLName.Text = ""
```

```
TxtNICNo.Text = ""
```

```
TxtAddress.Text = ""
```

```
TxtPhoneNo.Text = ""
```

```
TxtEmailID.Text = ""
```

```
End Sub
```

**‘ Update button click**

```
flag = 2
```

```
TxtCustID.Enabled = False
```

```
BtnSave.Enabled = True
```

```
BtnNew.Enabled = False
```

```
BtnDelete.Enabled = False
```

**‘to make update when click on save button, digit 2 is assigned to flag.**

```
flag = 2
```

```
End Sub
```

**3) Save button or save menu click code**

**‘Save button click**

```
Private Sub BtnSave_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)  
Handles BtnSave.Click
```

**‘ if the Add new button is clicked, then for make save process**

```
If flag = 1 Then
```

**‘To check whether every items are fill up or not**

```
If TxtNICNo.TextLength <> 10 Then
```

```
MsgBox("NIC Number is not in correct format!", MsgBoxStyle.Information,  
"TELESOON Customer Details")
```

```

TxtNICNo.Text = ""
TxtNICNo.Focus()

Exit Sub

ElseIf Mid(TxtNICNo.Text, 10, 1) = "V" Or Mid(TxtNICNo.Text, 10, 1) = "v" Or
Mid(TxtNICNo.Text, 10, 1) = "X" Or Mid(TxtNICNo.Text, 10, 1) = "x" Then

    TxtAddress.Focus()

Else

    MsgBox("NIC Number is not in correct format!", MsgBoxStyle.Information,
"TELESOON Customer Details")

    TxtNICNo.Text = ""
    TxtNICNo.Focus()

End If

If flag = 1 Then

    If TxtCustID.Text = "" Then

        MsgBox("Please click on AddNew button before enter the new details", ,
"TELESOON Customer Details")

        Exit Sub

    ElseIf TxtFName.Text = "" Then

        MsgBox("Please enter the First Name!", , "TELESOON Customer Details")

        TxtFName.Focus()

        Exit Sub

    ElseIf TxtLName.Text = "" Then

        MsgBox("Please enter the Last Name!", , "TELESOON Customer Details")

        TxtLName.Focus()

        Exit Sub

    ElseIf TxtNICNo.Text = "" Then

        MsgBox("Please enter the NIC Number!", , "TELESOON Customer Details")

        TxtNICNo.Focus()

        Exit Sub

    ElseIf TxtAddress.Text = "" Then

        MsgBox("Please enter the Address!", , "TELESOON Customer Details")

        TxtAddress.Focus()

```

Exit Sub

ElseIf TxtPhoneNo.Text = "" Then

MsgBox("Plase enter the Phone Number!", , "TELESOON Customer Details")

TxtPhoneNo.Focus()

Exit Sub

ElseIf TxtEmailID.Text = "" Then

MsgBox("Plase enter the Email Address!", , "TELESOON Customer Details")

TxtEmailID.Focus()

Exit Sub

Else

Try

**‘to add a new row in customer table**

dr = dt.NewRow()

**‘To insert all particular details to customer table in their suitable columns**

dr(0) = TxtCustID.Text

dr(1) = TxtFName.Text

dr(2) = TxtLName.Text

dr(3) = TxtNICNo.Text

dr(4) = TxtAddress.Text

dr(5) = TxtPhoneNo.Text

dr(6) = TxtEmailID.Text

**‘this update is used to add a new row in customer table**

SqlDataAdapter1.Update(DataSet1, "Customer")

**‘if the new row updated successfully, to display the information to user**

MsgBox("Successfully saved...!", MsgBoxStyle.Information, "TELESOON Customer Details")

clear()

**‘if the update button is clicked, then for make update with database**

flag = 2

TxtCustID.Enabled = False

BtnSave.Enabled = True

BtnNew.Enabled = False

BtnDelete.Enabled = False

**‘To update all particular details to customer table in their suitable columns**

dr(0) = TxtCustID.Text

dr(1) = TxtFName.Text

dr(2) = TxtLName.Text

dr(3) = TxtNICNo.Text

dr(4) = TxtAddress.Text

dr(5) = TxtPhoneNo.Text

dr(6) = TxtEmailID.Text

**‘if the edited row updated successfully, to display the information to user**

MsgBox("Data Updated Successfully...", MsgBoxStyle.Information, "TELESOON Customer Details")

Catch ex As Exception

MsgBox("Cannot update at this time!", MsgBoxStyle.Critical, "TELESOON Customer Details")

End Try

TxtCustID.Enabled = True

BtnNew.Enabled = True

BtnDelete.Enabled = True

**4) Delete button or menu click code**

**‘Delete button click**

Private Sub BtnDelete\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)  
Handles BtnDelete.Click

**‘if the navigation ckeek box is checked**

If CheckBox1.Checked = True Then

**‘prompt the user for confirmation and if the user click on Yes then to make delete**

If MsgBox("Are sure to delete this record?", MsgBoxStyle.YesNo, "TELESOON Customer Details") = MsgBoxResult.Yes Then

**‘to delete the row from the customer table in the dataset**

bm.RemoveAt(bm.Position)

**‘to delete the row from the customer table**

SqlDataAdapter1.Update(DataSet11, "Customer")

**‘if the deleted row updated successfully, to display the information to user**

```
MsgBox("Successfully deleted...!", MsgBoxStyle.Information, "TELESOON Customer  
Details")
```

**‘to prompt the users that how they can delete a row**

```
SqlDataAdapter1.Update(DataSet11, "Customer")
```

```
MsgBox("Successfully deleted...!", MsgBoxStyle.Information, "TELESOON  
Customer Details")
```

```
TxtShow.Text = bm.Position + 1 & " of " & DataSet11.Customer.Rows.Count
```

```
Else
```

```
MsgBox("Access is denied", MsgBoxStyle.Critical, "TELESOON Customer  
Details")
```

```
End If
```

```
Catch ex As Exception
```

```
MsgBox(ex.Message)
```

```
End Try
```

**5) Validate the user with digits number**

```
Dim sn As String = "1234567890."
```

```
Function autoNo() As String
```

```
Dim LR As DataRow
```

```
If (DataSet11.Tables("Customer").Rows.Count = 0) Then
```

```
Return ("C0001")
```

```
Else
```

```
LR =  
DataSet11.Tables("Customer").Rows(DataSet11.Tables("Customer").Rows.Count - 1)
```

```
Return Format(Val(Mid(LR("CustomerID"), 2)) + 1, "\C0000")
```

```
End If
```

```
End Function
```

**‘when user enter customer phone number**

```
Private Sub TxtPhoneNo_KeyPress(ByVal sender As Object, ByVal e As  
System.Windows.Forms.KeyPressEventArgs) Handles TxtPhoneNo.KeyPress
```

**‘if the user press correct format**

```
If Asc(e.KeyChar) = 8 Then Exit Sub
```

**‘if the user enter non correct format other than as in the sn string then to prompt the ‘user**

```

If (InStr(sn, e.KeyChar) = 0) Then
    e.Handled = True

    MsgBox("Please input digits only", MsgBoxStyle.Information, "TELESOON Customer
Details")

End If

End Sub

```

6) **Find button code**

```

With DataSet11.Tables("PurchaseOrder")

    With DataGrid1

        .CaptionText = "Search by Purchase Oredr ID"

    End With

    If CmbSearch.Text = "<ALL>" Then

        .DefaultView.RowFilter = "PurchaseOrderId like '%"

    Else

        .DefaultView.RowFilter = "PurchaseOrderId like '" & CmbSearch.Text & '%"

    End If

    If .DefaultView.Count = 0 Then

        MessageBox.Show("Data not found !.", "TELESOON", MessageBoxButtons.OK,
MessageBoxIcon.Information)

    Else

        MessageBox.Show("Number of data : " & .DefaultView.Count.ToString(),
"TELESOON", MessageBoxButtons.OK, MessageBoxIcon.Information)

    End If

    If BindingContext(DataSet11, "PurchaseOrder").Position < 0 Then

        With DataGrid1

            .CaptionText = "Database is empty !"

        End With

    End If

    DataGrid1.DataSource = .DefaultView

End With

```

7) **Code for add items details to a List View**

```

Sub list()

    n += 1

```

**‘to display the times of sales in the List View’s first column**

```
TextBox1.Text = n
```

**‘to display particular wanted details in List View**

```
Try    ListView1.Items.Add("")
        ListView1.Items(ListView1.Items.Count - 1).SubItems.Add("")
        ListView1.Items(ListView1.Items.Count - 1).SubItems.Add("")
```

**‘this will display the number in first column**

```
ListView1.Items(x).SubItems(0).Text = TextBox1.Text
```

**‘this will display the Item code in second column**

```
    ListView1.Items(x).SubItems(1).Text = CmbItemCode.Text.Trim
```

**‘this will display the Unit price in third column**

```
ListView1.Items(x).SubItems(2).Text = FormatCurrency(TxtUnitPrice.Text.Trim)
```

**‘this will display the quantity in forth column**

```
ListView1.Items(x).SubItems(3).Text = Val(TxtQuantity.Value)
```

**‘this will display the total price in fifth column as currency format**

```
    ListView1.Items(x).SubItems(4).Text = FormatCurrency(txtNetpay.Text.Trim)
```

**‘this will display the discount amount in sixth column as currency format**

```
    ListView1.Items(x).SubItems(5).Text = FormatCurrency(TxtDiscount.Text.Trim)
```

```
    x += 1
```

**Catch** ex As Exception

```
    MsgBox(ex.Message)
```

**End Try**

**8) Code for print the sales bill**

**‘Sales bill Print button click**

```
Private Sub BtnPrint_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles BtnPrint.Click
```

**To print the sales bill**

**‘to call Sales details within dataset**

```
SqlDataAdapter1.Fill(DataSet11, "Sales")
```

**‘prompt the user to access the print option**

```
If MsgBox("Are you sure you want to print the bill?", MsgBoxStyle.YesNo, "TELESOON") =  
MsgBoxResult.Yes Then
```

**on then for make a print**

```
Try
```

**‘datatable4 is for SalesBill table and new row is added**

```
dr2 = datatable4.NewRow
```

**‘values are assigned to particular fields**

```
dr2(0) = TxtSaleBillNo.Text
```

```
dr2(1) = CmbCustID.SelectedItem
```

```
dr2(2) = TxtCustName.Text
```

```
dr2(3) = TxtNIC.Text
```

```
dr2(4) = Val(TxtTotalNetpay.Text
```

```
dr2(5) = DateTimePicker1.Value)
```

```
datatable4.Rows.Add(dr2)
```

**‘to update the new row in SalesBill table**

```
SqlDataAdapter5.Update(DataSet11, "SalesBill")
```

```
MsgBox("Added to Sales Bill Successfully")
```

**‘After added, for clear details**

```
TxtTotalNetpay.Clear()
```

**Sales Bill**

```
Function autoNo2() As String
```

```
Try
```

```
Dim L As DataRow
```

```
If (DataSet11.Tables("SalesBill").Rows.Count = 0) Then
```

```
Return "B_1000"
```

```
Else
```

```
L = DataSet11.Tables("SalesBill").Rows(DataSet11.Tables("SalesBill").Rows.Count - 1)
```

```
Return Format(Val(Mid(L("SalesBillNo"), 3)) + 1, "\B_0000")
```

```

End If

'Catch ex As Exception
' MsgBox(ex.Message)

'End Try

End Function

```

9) **Code for update Item details when make a sale**  
**'datatable2 for Item Details**

```

For i = 0 To datatable2.Rows.Count - 1

'if the item code is matched with Item details table's item code

If cmbitcode.Text = datatable2.Rows(i).Item(0) Then

'to subtract the quantity from item details

datatable2.Rows(i).Item(9) = datatable2.Rows(i).Item(9) - Val(qty.Value)

'to update the quantity in ItemDetails table

SqlDataAdapter3.Update(DataSet11, "ItemDetails")

End If

```

10) **Code for display Re-order alert message**

```
Imports System.Data.SqlClient
```

```
Imports System.Data
```

```
Public Class ReOrder
```

```
    Inherits System.Windows.Forms.Form
```

```
    'db connection
```

```
    Dim con As SqlConnection = New SqlConnection("workstation id='SIVAKUMA-  
C6575E';packet size=4096;integrated security=SSPI;data source='.';persist security  
info=False;initial catalog=TELESOON")
```

```
    Dim da As New SqlDataAdapter
```

```
        Dim ds As New DataSet
```

**'to make a connection**

```
da.SelectCommand = New SqlCommand
```

```
    da.SelectCommand.Connection = con
```

```

da.SelectCommand.CommandText = "SELECT
ItemCode,ItemName,Model,ModelNo,ProductCompany,Quantity FROM Product WHERE
Quantity < ReOrder"

```

```

da.SelectCommand.CommandType = CommandType.Text

```

```

con.Open()

```

```

ds.Clear()

```

```

da.Fill(ds, "ReOrder")

```

```

con.Close()

```

```

DataGrid1.DataSource = ds.Tables("ReOrder")

```

```

Button1.Visible = False

```

**11) Code for when user select quantity at the sale time  
‘when Quantity value is changed**

```

Private Sub TxtQuantity_ValueChanged(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles TxtQuantity.ValueChanged

```

```

    'unisto.ReadOnly = False

```

```

    TxtDiscount.Text = 0

```

```

    TxtDisPerset.Text = 0

```

**if the quantity value is 0, then total price value is also 0**

```

If Val(TxtQuantity.Value) = 0 Then

```

```

    TxtTotal.Text = 0

```

**‘if unit stock is 0, then for display the below message**

```

ElseIf Val(TxtUnisto.Text) = 0 Then

```

```

    MsgBox("Items not in the stock", , "TELESOON ")

```

```

    Exit Sub

```

**‘if the sale quantity is more than unit stock, then for display the below message**

```

ElseIf Val(TxtQuantity.Value) > Val(TxtUnisto.Text) Then

```

```

    MsgBox("Can't sell more than stock in hand", , "TELESOON Sales")

```

```

    TxtQuantity.Value = TxtQuantity.Value - 1

```

```

    Exit Sub

```

# APPENDIX G. CLIENT CERTIFICATE

No-17, Swarna Road,

Colombo-06.

## Conformation of Software solution of Inventory Management System

Mrs.U.Jasutha has done Software solution of the Inventory Management System for phone shop in her BIT project.

She has gathered data and information from our premises for develop the system and it is in the process of gathering requirements system.

The Management of Telesoon has to accept the system for our Telesoon, after the completion of testing since it satisfies the requirements.

Thanking You.

Yours truly,

  
.....  
 **Telesoon Phone Shop**  
No.32,K.K.S Road,  
Chunnakam  
021 2241552,071 1907466

# GLOSSARY.

**Access Control** – Control the limit of user access to programs and data.

**Architecture** – The logical and physical structure of the system, forged by all the strategic and tactical design decisions applied during development.

**Attributes** – Properties of the entities and relationships.

**Candidate key** – A candidate for a primary key.

**Cardinality** – Number of records involve in a relationship.

**Command Line Interface** – (CLI) – Command line based interface.

**Composite Key** – A primary key, that consists of more than one column

**Data** – Isolated facts.

**Database** – An organized store of data.

**Data follow** – Data following between process, data flows, data stores and external entities.

**Data follow diagram** – A diagram depicts the flow of data.

**Development Process** – a set of steps to build a system.

**Entities** – Distinct objects in the system.

**Feedback** – Using variations from a system goal to change system behaviour.

**Form** – The primary unit of the user interface in a windows forms application. A form uses for data display and user input.

**Function** – Produces well defined outputs from given inputs.

**Foreign key** – A column in a table, which is used as a link to matching columns in other tables.

**Graphical user interface (GUI)** – Screens and functions that provide a graphical means for an end user to access a computer system.

**Human computer interaction (HCI)** – Is the study, planning, and design of what happens when you and a computer work together.

**Menu** – A set of alternative selection presented to a user in a window.

**Normalization** – The process of reducing a complex data structure into its simplest, most stable structure.

**Primary Key** – A column in a table, whose values uniquely identify the rows in the table. A primary key value cannot be NULL.

**Random Access Memory (RAM)** – The volatile memory used to temporarily store information for processing.

**Relationships** – Meaningful interaction between objects.

**Requirement Analysis** – Description of what the system should do.

**Structured Query Language (SQL)** – Structured Query Language is a standard interactive and programming language for getting information from and updating a database.

**System Development Life Cycle (SDLC)** – A methodology used to developed, and replace information system.

**Verifications** – This is to find out the system is without errors.

**Validation** – This is basically focuses on whether the system satisfies all the user requirements.

**White box testing** - Focusing the internal structure and logics of the system