

SUPERMARKET ADMINISTRATION AND MANAGEMEN SYSTEM

BY

ABDIKARIM ABOKOR ISSE
ID: 141-25-359

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Masters of Science in Computer Science & Engineering

Supervised By

Dr. SYED AKHTER HOSSIAN
Professor and Head
Department of CSE
DaffodilInternationalUniversity



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

APRIL, 2015

APPROVAL

This Project titled “**Supermarket Administration and Management System**”, submitted by Abdikarim Abokor Isse to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of MSc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 21 April, 2015.

BOARD OF EXAMINERS

Dr Syed Akhter Hossain
Professor and Head

Department of Computer Science and Engineering
Faculty of Science & Information Technology
DaffodilInternationalUniversity

Chairman

Dr Sheak Rashed Haider Noori
Asstt. Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
DaffodilInternationalUniversity

Internal Examiner

A.H.M. Saiful Islam
Asstt. Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
DaffodilInternational University

Internal Examiner

Dr Muhammad Shorif Uddin
Professor and Chairperson

Department of Computer Science and Engineering
Jahagirnagar University

External Examiner

DECLARATION

Hereby declare that, this project has been done by me under the supervision of **Dr Syed Akhter Hossain, Professor and head**, department of Computer Science and Engineering, Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:

Syed Akhter Hossain
Professor and Head
Department of CSE
Daffodil International University

Submitted by:

Abdikarim Abokor Isse
ID: 141-25-359
Department of CSE
Daffodil International University

ACKNOWLEDGEMENT

First I would like to express my heartiest thanks to Almighty “ALLAH” In the name of Allah, the Most Gracious and the Most Merciful Alhamdulillah, all praises to Allah for the strengths and His blessing in completing of our project. Special appreciation and heartiest gratitude goes to my supervisor, **Dr Syed Akhter Hossain Professor and Head**, Department of Computer Science and Engineering, Daffodil International University for his supervision and constant support throughout this project. His invaluable help of constructive comments and suggestions throughout the experimental and project works have contributed to the success of this research. I would also to express my appreciation to my friends, Special thanks, tribute and appreciation to all those their names do not appear here who have contributed to the successful completion of this project.

I would like to thank all those who assisted, encouraged and supported me during this project, be assured that the Allah will bless you all for the contributions you made.

Last but not least, my deepest gratitude goes to my beloved parents for their support and encouragement for all time in my life.

DEDICATION

I dedicate my book to my family. A special feeling of gratitude to my loving parents for their endless love, support and encouragement. Thank you for giving me a chance to prove and improve myself through all my walks of life.

ABSTRACT

The Project “Supermarket administration and management system” deals with the automation of supermarket. This software will help salespersons in managing the various types of Records pertaining to his/her customer.

This system is based on the sales transaction of items in a supermarket. The first activity is based on adding the items to the system along with the rate which are present in the supermarket and the name of the items which the supermarket will agree to sell. This authority is given only to admin. Any modifications to be done in the item name or the in the rate can be done only by admin. He also has the right to delete any item. As the customer buys the products and comes to the billing counter, the user is supposed to enter the item name he purchased and the quantity of the item he wanted to purchase. This is not a huge a task. The system will display all the items whose name starts with the letter selected by the user. He can select out of those displayed. Finally a separate will be generated for each customer. This will be saved in the database. Any periodic records can be viewed at any time. If the stock is not available; the supermarket orders and buys from a prescribed vendor. The amount will be paid by deducting the total amount acquired in the sales activity. Admin provides a unique username and password for each employee through which he can login

The product will help the user to work in a highly effective and efficient environment. The salespersons have been recording the customer information in the past and even in the present through their personal manual efforts. And indeed, it consumes their considerable time and energy that could be utilized in the better productive activities. Apart from that, with increasing customer Strength, the task of managing information of each individual customer is indeed a cumbersome task.

There are a lot of reasons we implemented this project. In the manual System, there are number of inefficiencies that a salesperson faces.

The information retrieval is one of the foremost problems. It is very difficult to gather the overall performance reports of the customer.

Large records-books have to be maintained where relevant and irrelevant information has to be stored which is very untidy and clumsy process. On the other hand, there are many inherent problems that exist in any manual system. Usually, they lack efficiency. Less efficiency has a great impact on the productivity of any human being keeping the data up-to-date. The new system will cater to the need of the salespersons of any supermarket so that they can manage the system efficiently.

TABLE OF CONTENTS

CONTENTS	PAGE
APPROVAL.....	I
DECLARATION	II
ACKNOWLEDGEMENT	III
DEDICATION	IV
ABSTRACT.....	V
TABLE OF CONTENTS.....	VI
LIST OF FIGURES	X
LIST OF TABLES	XI
CHAPTER ONE	1
INTRODUCTION	1
1.1 Overview of supermarket management system:.....	1
1.2 Objectives	2
1.3 Methodology.....	2
1.4 Scope of project	2
1.5 Significant of study.....	3
1.6 Motivation.....	3
1.7 Goals.....	3
CHAPTER TWO	4
LITERATURE REVIEW	4
2.1 Introduction.....	4
2.2 Types of Supermarket.....	5
2.3 Inventory Management.....	6
2.4 Inventory Management System	6
2.5 Manual System	7

2.6	Barcode	7
2.7	Radio Frequency Identification	7
2.8	Theoretical Literature	9
2.8.1	Cultural factors	9
2.8.2	Human Factors	9
2.8.3	Social Factors	10
2.8.4	Organizational structure factor	10
2.8.5	Economic factor	10
2.8.6	Governmental and Political Factor	10
2.9	Early Expectations of Supermarket Takeover:	11
CHAPTER THREE.....		12
SYSTEM PROFILE.....		12
3.1	Project profile	12
3.1.1	Supermarket.....	12
3.1.2	Management	12
3.1.3	System	12
3.1.4	Supermarket Management System	12
3.2	Current System	13
3.3	Data gathering.....	13
3.4	Problem Statement.....	14
3.5	Proposed System.....	14
3.5.1	Overview	14
3.5.2	Benefits of proposed system.....	15
CHAPTER FOUR.....		16
FEASIBILITY STUDY		16
4.1	Technical Feasibility:.....	17
4.2	Economic feasibility	17
4.3	Operational Feasibility:	17
4.4	Schedule Feasibility:.....	18
4.5	Behavioral Feasibility:.....	18

CHAPTER FIVE.....	19
SOFTWARE REQUIREMENTSSPECIFICATION	19
5.1 Introduction.....	19
5.2 User class and characteristics	19
5.3 External interface requirements	20
5.3.1 Hardware Interface:	20
5.3.2 Software Interface:	20
5.4 Use Case Model.....	20
CHAPTER SIX	26
SYSTEM DESIGN ARCHITECTURE.....	26
6.1 System Design	26
6.2 Project Idea	26
6.3 Project Concept.....	26
6.4 Project Appraisal	27
6.5 Description of tools used:	27
6.5.1 Front end system design	27
6.5.2 Back end system design	28
6.6 Conceptual Design.....	29
6.6.1 Data Model	29
6.6.2 Process model.....	29
6.6.3 Logical Data Model.....	29
6.7 Data flow diagram	31
6.8 Entity Relationship	33
6.8.1 One-to-One	34
6.8.2 One-to-Many	34
6.8.3 Many-to-Many.....	35
CHAPTER SEVEN.....	36
SOFTWARE DEVELOPMENT LIFE CYCLE	36
7.1 Software	36
7.2 Software Development	36

7.3	Software development methodology	36
7.4	Software development life cycle	37
7.4.1	Waterfall model	37
7.4.2	Prototype model	39
7.4.3	Spiral model	41
7.4.4	Incremental Model	42
CHAPTER EIGHT		44
TESTING AND IMPLEMENTATION		44
8.1	Testing	44
8.2	Software testing	44
8.3	Basics of software testing	44
8.3.1	White box Testing	44
8.3.2	Black box Testing.....	45
8.4	Testing objectives	45
8.5	Testing methodology	45
8.6	Types of testing.....	46
8.6.1	Unit Testing:.....	46
8.6.2	Integration Testing:	46
8.6.3	System Testing:	47
8.6.4	Acceptance Testing:	47
8.7	Implementation	47
CHAPTER NINE		62
CONCLUSION AND FUTURE WORK		62
9.1	Conclusion	62
9.2	Future work.....	62
REFERENCES.....		63

LIST OF FIGURES

FIGURES	PAGES
Figure 5.4 Customer use case diagram in supermarket.....	22
Figure 5.4.1 Admin use case diagram in supermarket	23
Figure 5.4.2 Sales use case diagram in supermarket.....	24
Figure 5.4.3 Supermarket use case diagram.....	25
Figure 6.7.1 Customer Data flow daigram	31
Figure 6.7.2 Admin Data flow diagram	32
Figure 6.8 Entity-relationship diagram.	33
Figure 6.9 Supermarket entity diagram.....	33
Figure 6.8.1 One to one entity relationship diagram.....	34
Figure 6.8.2 One to many entity relationship diagram.....	34
Figure 6.8.3 Many to Many entity relationship diagrams	35
Figure 7.4 Software development life cycle.....	37
Figure 7.4.1 Waterfall model	38
Figure 7.4.2 Prototype model	39
Figure 7.4.3 Spiral model	41
Figure 7.4.4 Incremental model	42
Figure 7.4.4 Incremental life cycle model.....	43
Figure 8.5 Level of testing.....	45
Figure 8.6 Types of testing.....	46
Figure 8.8 Login form	48
Figure 8.9 Home page form	49
Figure 8.10 Customer registration form	50
Figure 8.11 Employee registration form	51
Figure 8.12 Supplier registration form	52
Figure 8.13 Items registration form.....	53
Figure 8.14 User registration form	54
Figure 8.15 Sales form	55
Figure 8.16 Order form	56
Figure 8.17 Order detail form.....	57
Figure 8.18 Item's damage form.....	58
Figure 8.19 Sales return form.....	59
Figure8.20 Payment form.....	60
Figure 8.21 Receipt form.....	61

LIST OF TABLES

TABLE	PAGE
Table 4.2 Economical feasibility.....	17
Table 4.4 Schedule feasibility.....	18
Table 5.3.1 Hardware interface.....	20
Table 5.3.2 Software interface.....	20

CHAPTER ONE

INTRODUCTION

1.1 Overview of supermarket management system:

Web application is the modern form of distributed application. There are many exciting aspects of web application but also obscurities due to limited features available in different browsers. One of most important aspect of web development is platform independence. Web applications consist of three pillars. First pillar is presentation layer; second pillar is server side programming and third is database. In web based application development, the selection of server side programming technology and database management system is crucial. Selection of both technologies should be based on the requirements of the proposed application. We have selected Visual Basic 2008 as a front end and SQL 2008 as a Back end because it has grown to be tool of choice for most of the programmers when compared to any other programming language and has been strategically placed by Microsoft to be the corner stone of windows programming.

Supermarket management system is the system where all the aspects related to the proper management of supermarket is done. These aspects involve managing information about the various products, staff, managers, customers, etc. This system provides an efficient way of managing the supermarket information. Also allows the customer to purchase and pay for the items purchased. This system will facilitate to know how many Items are sold and how many Items are in the Store and also we need to know customer balance and also we classify the supermarket it's a profit or loss. The users will consume less time in calculation and the sales activity will be completed within a fraction of seconds whereas manual system will make the user to write it down which is a long procedure and it also consumes a lot of time. The data will be stored in the database. Because of this software, paper work will be reduced and the user can spend more time on the monitoring the supermarket. The project will be user friendly and easy to use. This project is helpful to computerize the item transaction, sales activity record keeping which is a very huge task and maintaining the stock. With the continuous development and improvement of computer technology, communication technology, network technology, as well as large-scale database technology, the commercial large supermarket competition has become the information technology, the chain of low-cost competition.

The level of the enterprise information construction has become an important indicator of the company's sustainable development.

Most of the domestic supermarket management focuses on the theoretical study of database management and network management. Computer controls all aspects of the implementation including research,

Purchase orders, receiving, inventory, sales to the back, achieving system automatically make decision.

1.2 Objectives

- This project is a software application which is designed in vb.net for managing sales, purchases, stock details which are going out and coming in to supermarket. Details are maintained in centralized database.
- The main objective of our project is to make efficient transaction management system which is user friendly and at the same time powerful.
- Making the system reliable, easier, fast, and more informative.
- It has capability to keep the complete information of a transaction and to copy it whenever required.
- System plays an important role in achieving the desired plant availability at an optimum cost.
- To produce software which manages the sales activity done in a supermarket, maintaining the stock details, maintaining the records of the sales done for a particular month/year.
- The users will consume less time in calculation and the sales activity will be completed within a fraction of seconds whereas manual system will make the user to write it down which is a long procedure and it also consumes a lot of time.

1.3 Methodology

The main method used for this research was interview. Data were collected from different supermarkets which some half of them use manual system while others use computerized system and customers of both type of supermarkets. Interviewing the people who worked and have experience how to manage Supermarket (Ordering, Purchasing, Selling, Storing Items, Payment, & Receipt). To know the quality and the intensity of the information we need.

1.4 Scope of project

Scope of this project is to investigate and design a software solution which can facilitate both customer and salesperson in performing their daily tasks, improving efficiency, and helping them to be more productive. This project will provide a solution through which salesperson can easily manage, handle and generate all required information in their respective format when needed. This system covers stock control, management and tends to correct anomalies in business. It analysis opening of new stocks, stock updates and ability to view existing ones. It provides quick way of operation by capturing the manual process and automating them.

It will help them to manage order details, financial data, and historical data and also in producing documents of different formats for different customers.

This solution will help salesperson in reducing effort spend on managing orders. It will also provide them opportunity to explore possibility of generating documents, managing financial details.

1.5 Significant of study

Supermarket management, maintenance and control are a vital tool in any business. The tool which management use in its control is of vital importance. To know to place order for a new item and update current status will depend on how information processing is handled.

1.6 Motivation

This project is motivated us by two main reasons; the problems that the supermarket has for all time, such as: it hasn't computer system or web based help admin person to control the transactions and any activity going on inside supermarket. Another reason is related to our own needs of developing any software which will facilitate the customers to purchase items quickly and for solving the problems said above.

1.7 Goals

By using this applicationwe can check the items present or not from the current location and purchase the items using one of this process credit card, E- cash, Zaad service, or cash. So we can reduce the time for shopping.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This literature review forms the framework on which the research is based as it helps to develop a good understanding of and insight into relevant previous research and emerging trends. It highlights the study's main objectives and the determinants influencing the implantation of inventory systems in supermarkets in the county.

A supermarket is a large form of the traditional grocery store, it is a self-service shop offering a wide variety of food and household products, organized into aisles. It is larger in size and has a wider selection than a traditional grocery store, but is smaller and more limited in the range of merchandise than a hypermarket or big-box market. The concept of an inexpensive food market relying on large economies of scale was developed by Vincent Astor. He founded the Astor market in 1915, investing \$ 750,000 of his fortune into a 165 by 125 corner of in the famous 95 Manhattan avenue, creating in effect, an open air mini-mall that sold meat, fruit, produce and flowers. The expectation was that customers would come from great distances ("miles around"), but in the end even attracting people from ten blocks away was difficult, and the market folded in 1917. The concept of a super market was developed by entrepreneur Clarence and his Wiggly stores. His first store opened in 1916. Saunders was awarded a number of patents for the ideas he incorporated into his stores. The stores were a financial success and Saunders began to offer franchises. The Great Atlantic and Pacific Tea company, which was established in 1859 was another successful early grocery store chain in Canada and the United States, and became common in North American cities in the 1920. The general trend in retail since then has been to stock shelves at night so that customers, the following day, can obtain their own goods and bring them to the front of the store to pay for them. Although there is a higher risk of shoplifting, the costs of appropriate security measures ideally will be outweighed by reduced labor cost. Historically, there was debate about the origin of the supermarket, with King Kullen and Falphs of California having strong claims. Other contenders included Henke and pilot. To end the debate, the food marketing Institute in conjunction with the Smithsonian Institution and with funding from H.J Heinz, researched the issue. It defined the attributes of a supermarket as "self-service, separate product departments, discount pricing, marketing and volume selling."

It has been determined that the first true supermarket in the United States was opened by a former Kroger employee, Michael J. Cullen, on August 4, 1930, inside a, 6000-square-foot (560m)

Former garage in Jamaica in New York City. The store, King Cullen, (inspired by the fictional character King Kong), operated under the slogan "Pile it high. Sell it low." At the time of Cullen's death in 1936, there were seventeen King Cullen stores in operation. Although Saunders had brought the world self-service, uniform stores

and nationwide marketing, Cullen built on this idea by adding separate food departments, selling large volumes of food at discount prices and adding a parking lot.

In the United Kingdom, self-service shopping took longer to become established. Even in 1947, there were just ten self-service shops in the country. In 1951, ex-US Navy sailor Patrick Galvani, son-in-law of Express Dairies chairman, made a pitch to the board to open a chain of supermarkets across the country. The UK's first supermarket under the new Premier Supermarkets brand opened in Streatham, South London, taking ten times as much per week as the average British general store of the time. Other chains caught on, and after Galvani lost out to Tesco's Jack Cohen in 1960, to buy the 212 Irwin's chain, the sector underwent a large amount of consolidation, resulting in 'the big four' dominant UK retailers of today: Tesco, Asda (owned by Wal-Mart), Sainsbury's and Morrison's. In the 1950s, supermarkets frequently issued trading stamps as incentives to customers. Today, most chains issue store-specific "membership cards," "club cards," or "loyalty cards". These typically enable the card holder to receive special members-only discounts on certain items when the credit card-like device is scanned at check-out. Sales of selected data generated by club cards is becoming a significant revenue stream for some supermarkets.

2.2 Types of Supermarket

Supermarket is categorized into different types due to their size, scale, products offered, store format and trends while people use the terms "Grocery Store", "Hypermarket" and "Big box market" interchangeably to refer to retail food stores, industry watchers offer more specific guidelines about different types of Supermarket. "Hypermarkets" are on the larger end of this spectrum and carry a diverse mix of food and general merchandise. Nomenclature is not always uniform. Financial Institutions Fund places Wal-Mart in the same category as supermarkets, but accounting for only the supercenter's grocery division. The food marketing Institute classifies superstores as a large type of supermarket, while designating warehouse stores as grocery stores.

Grocery Store: A grocery store is a retail store that primarily sells food. A grocer is a bulk seller of food. Grocery stores often offer non-perishable food, with some also having fresh produce, butchers, delis, and bakeries. Large grocery stores that stock significant amounts of non-food products, such as clothing and household items, are called supermarkets. Some large supermarkets also include a pharmacy and an electronics section, the latter selling DVDs, headphones, digital alarm clocks, and similar items. Grocery stores operate in many different styles ranging from rural family-owned operations, such as IGAs, boutique chains, such as Whole Market and Trader Joe's to larger supermarket chain stores. In some places food cooperatives or "co-op" markets owned by their own shoppers, have been popular. However, there has recently been a trend towards larger stores serving larger geographic areas.

Hypermarket: Is an advanced supermarket which has an additional department store. The result is an expansive retail facility carrying a wide range of products under one roof, including full groceries lines and general merchandise. In theory, hypermarkets allow customers to satisfy all their routine shopping needs in one trip. After the successes of supermarkets and hypermarkets and amid fears that smaller stores would be forced out of business, franchise laws that made it more difficult to build hypermarkets and also restricted the amount of

economic leverage that hypermarket chains can impose upon their suppliers. In France, hypermarkets are generally situated in shopping centers (French: Centre commercial or Centre d'achats) outside of cities, though some are present in the city center. They are surrounded by extensive car parking facilities, and generally by other specialized superstores that sell clothing, sports gear, automotive items, etc.

Bigboxmarket: Is a physically large retail establishment, usually part of a chain. The term sometimes also refers, by extension, to the company that operates the store. The store may sell general dry goods, it is generally inaccessible to pedestrians and often can only be reached by motor vehicles, the big-box store is regarded as unsustainable and a failure of urban planning. Some conservatives worry about the economic impact of big-box retailers on established downtown merchants or the sprawl-inducing impacts on the character of such developments, as these stores are often associated with heavy traffic in the areas around the store locations. Some communities have adopted a higher level of architectural treatment and regulations to ensure that the superstores relate better to their environs and neighbors. Many regulate signage and landscaping. There are also concerns surrounding traffic and roads. The increased traffic leads to more air pollution in an area and higher taxes in order to maintain the roads.

2.3 Inventory Management

Inventory management is a process of ensuring adequate quantities, good qualities, at a low cost is procured. Folks (2004) assert that the objective of inventory management is to ensure sufficient levels of stock, to maintain an acceptable level of stock to satisfy the demand while minimizing associated holding, administration, and stock out costs. He goes ahead to say that running out of stock is very costly (stock out) for example if a shop that is persistently out of stock, customers will disappear and find other suppliers elsewhere. Inventory management focuses on how many units of each inventory items a firm should hold in stock, how much should be ordered at a given time and at what point or stage should inventory be ordered. (Brigham and Gapenski 1997). In a manufacturing firm inventory management can be classified as raw-materials, work in progress, supplies and consumables, components and assemblies and finished goods. (Lysons and Farrington 2006).

2.4 Inventory Management System

There are different types of systems that are used in supermarket management, companies need to control the type of materials they purchase, plan which products are to be produced and in what quantities and ensure that they enable to meet current and future customer demand, all at the lowest cost possible. Thus a good inventory management system is vital in the operations of a firm. (Ashcroft, 2005).

Some of the old methods used most supermarkets in our country are.

2.5 Manual System

Many small business owners, especially if the business has very few products, keep track of inventory manually. The easiest way to perform manual inventory managements to use a spreadsheet. For example, a small bakery might use a spreadsheet to keep track of inventory purchases and usage. The owner can also set up the spreadsheet to calculate when ingredients need to be reordered. At the start of each week, the owner manually counts the raw ingredients and components she has on hand. She enters these values in the spreadsheet. She also enters her expected usage based on existing orders. Using the appropriate spreadsheet formulas, she determines if she has enough Materials for the week or if she'll need to purchase more. Manual systems allow the small business owner to manage inventory with very little investment in systems or training. Maintaining data integrity is a major downside to manage inventory using a spreadsheet. A single data entry or formula error can cause major inaccuracies in the data output.

Most supermarket inventory owners use hard copy books to write their transactions, customer's data, item's registration, item price and loans if book loss or writing is wiped out all data will loss and cause big problem.

After manual and hand writing books some supermarkets in Somalia used these systems to calculate their daily activities.

2.6 Barcode

Supermarket management systems that use barcode technology increase the accuracy and efficiency of managing inventories. All major retailers use barcode technology as part of an overall inventory management program. When a barcode gets read at the point-of-sale (the computerized cash register), supermarket sales data are immediately read to a broader system that maintains usage statistics. The company's purchasing department uses these data to make buying decisions based on sales and existing inventory levels. Barcodes also manage inventory at the warehouse level. Most warehouses use barcode or radio frequency identification (RFID) to scan incoming inventory into the warehouses inventory management or warehouse management software.

Barcode technology facilitates the movement of inventory within the confines of the warehouse (from one location to another) or from the supplier to the warehouse (receiving) and from the warehouse to the customer (picking, packing and shipping).

2.7 Radio Frequency Identification

While barcode technology has done a lot to increase the accuracy and efficiency of managing inventory, radio frequency identification (RFID) has raised the bar on supermarket management. Companies that use RFID typically move thousands of pieces of inventory through their doors. RFID uses two types of technology to manage inventory movements--active and passive technology. Active RFID technology uses fixed tag readers assigned throughout a warehouse. Anytime an item with an RFID tag passes the reader, the movement of the item is recorded in the supermarket management software.

Active systems work best in environments that require real-time inventory tracking or where inventory security problems exist. Passive RFID technology requires the use of handheld reader's to monitor supermarket movement. Just as in an active system, once an inventory item's tag is read, the movement data are transmitted to the company's inventory management software. Because RFID technology has a reading range of up to 40 feet using passive technology and 300 feet using active technology, it greatly increases the accuracy of moving inventory around a warehouse.

Some Potential Factors to be considered before implementing supermarket system

- 1. Cost Generally:** one of the most important factors which users consider before making a purchase is the cost. Although price should not be the only determining factor when buying software, most users still consider the affordability of a product before buying it, especially in a time of limited resources which many supermarkets are currently experiencing. Therefore, it will be ideal to know beforehand the budget appropriated for inventory system before and when planning to implement one.
- 2. Ease of use:** Most software users today expect an easy-to-use or a user-friendly system. Days are gone when software vendors could easily sell intimidating computer systems to their customers. Today, almost all users demand simple and easy-to-use systems to avoid spending extra time and money in training themselves learning how to use a system. Therefore, ease of use of a system should be considered when planning for an inventory system.
- 3. Track ability of the system:** Tracking capability of the system needs to be known before its purchase. Inventory control systems are designed for different applications. While some are designed to track discrete, non-perishable items like hand tools, others are designed to track expendable items such as milk and other edibles. Even when they are designed exclusively for tracking discrete, non-perishable or perishable items, the user is still faced with the problem of determining the nature and characteristics of the items to be tracked. Therefore, potential systems should be studied to determine exactly what each system is designed to do, and matching that function with the user's needs, before making the expenditure. Related to the tracking ability feature is whether the system has barcode compatibility. The barcode feature of an inventory system makes it possible for items to be easily scanned during check-out and check-in, without the use of manual data entry, which is slow, clumsy and prone to mistakes. Very often, it is also ideal to have a portable scanning system. The portability of the system makes it possible for operators to walk to remote locations in the lab, factory or shop floor and scan items there without having to do it at the crib. Also, when items to be scanned are too heavy to be moved around, the barcode scanner can be taken to their location instead. Most systems also are capable of generating different reports on specific items, such as on item status report or available material quantity at any given time. These reports are particularly useful when the attendant needs to send the information to remote locations, or when it is necessary to inform a user of a missing item that it was due and needed to be returned. Some, if not all, users will like to know when the quantity of an item has reached a certain point so that a new order can be economically made to replenish it. For such users, the economic order quantity (EOQ) option of the system is a necessity. This will allow the inventory control system to automatically sound an alarm whenever a preset point is reached. Lastly, because many users like to keep their systems upgraded to keep up with the latest version of the product, the possibility of future upgrade should be mentioned. Purchasing a TIC system with future upgrade in mind not only ensures its longevity but also will help users to keep up with the future technological upgrade of the system at perhaps little or no cost to the

2.8 Theoretical Literature

Adoption of a new system in any organization usually faces several setbacks. Many factors affect the adoption of new systems, some positively and others negatively. New and upcoming inventory systems incorporate information technology (IT) based.

The factors include;

2.8.1 Cultural factors

Culture is a broad term with parts and components e.g. religion, government and politics, economical structures and activities. Schein (1990) links the culture concept to the dual pressures upon human beings to face external and internal adaptations. He proposes, defining culture as;

- (1) A pattern of basic assumptions
- (2) Invented, discovered or developed by a given group.

Generally culture affects the way people respond to new system. Slowinkowski and Jarrat (1997) note that the effect of cultural factors e.g. traditions and religion have a greater impact on adoption of technology and must be considered with great care in the adoption process. The finding of the study suggests that a technological environment is not necessarily open for adoption of technological change and that the learning orientation plays a critical role in the assimilation of new technology (Brainin and Erez, 2004).

Madon (1997) reported that technology particularly IT is not culturally neutral. Every technology depicts the culture of the manufacturing country. Developing countries e.g. Kenya cannot easily grasp the new technology as quickly as developed countries do. They find it difficult to cope with pace of changes generated by adoption of new technology.

2.8.2 Human Factors

Szewezak and Snod Grass (2002) say that individuals play an effective and important role in technology adoption process. A technique is not successful if its user does not

accept it and in case of inventory management system, it is also true the lack of acceptance of new systems has long been an impediment to the success of new technologies, therefore, its understanding has been a high priority item for researchers and practitioners like (Chau and HU, 2002; Young Katesh and Davese, of 2000)

2.8.3 Social Factors

The social change works in both ways: it can become the reason for introduction of new systems or become a barrier to new systems adoption as this is a great error of technological changes, so every day companies come across new products and services yet the habits, taste, customs, values and culture of any country or organization do not allow them to go for change. So organizations have to think otherwise, to defer or totally reject few technology adoption decisions. Godwin and Guimaraes of (1994) for instance say that three factors are to be considered to see social involvement in technological advances i.e.

(1) Social need to feel strong desire of something.

(2) Social resources, the capital, material and security personnel vital for innovation and adoption of new things.

(3) People also feel that social factors need to be considered before technological factors. g. A developing country will appreciate creation of more jobs better than introduction of a new technology, these slows down adoption of new systems.

2.8.4 Organizational structure factor

Robin and Coulter (2002) describe that the organizational structure is its framework, which is expressed by its degree of complexity, formalization and centralization. It comprises of divisions, department and sections. Relationships between the individuals, groups and departments affects the rate of reception and induction of a new system. Brainin and Erez (2004) argue that bureaucratic systems in organizations make it rigid, thus add to adopt to change where else organic organizations are highly adaptive to change if need arise. Hussain and Hussain (1993) narrates that Pakistan organizations are formal and hierarchical structure, consequently policies are centralized in head offices thus employees are not incorporated in policy making. This makes incorporation of change slow.

2.8.5 Economic factor

Economic issue has a great impact on the adoption of new systems. In a method like RFID, initial cost of investment is high. This makes it hard for small supermarkets to adopt the method. The return on investment (RI) is also considered. Systems with RI are favored.

2.8.6 Governmental and Political Factor

Ayeni (2004) says that technology acquisition raises a number of political questions. The first relates to the dependence of the receiving nations on the supplying nation and this technological dependence could become a political one. So it is the responsibility of a government to select carefully the country from where technology acquisition is made so that no political problems could arise in future. The second question relates to the possible transfer of political power from political elites to the technical specialists. This problem is more prominent in

computer-based technologies because these technologies are directly related with retrieval and processing of data and information. The people at the management level are mainly from non-technical backgrounds, as a result of which there is always a tension between these two groups. The third question concerns the selection of countries to which certain technology could be transferred. Another researcher named Bhatnagar(1992) pointed out that political competition among organizational groups for influence over the organizational policies, procedures, and resources. New technology like IT inevitably becomes bound up in organizational politics because it influences access to a key resource namely „information“. So IT can effect who does what to whom, when, where, and how in an organization. As IT systems change organizations“ structure, culture, politics, and work, so there is often considerable resistance to them when they are introduced and there is a need to reduce this resistance Bhatnagar and Odedra (1990). Montealegre(1999) also notes that there are various interest groups in an organization, which form a hierarchy and have a considerable share of political power, few of them are very receptive to new technology and the other creates resistance. Therefore, new Technology may have to face severe resistance and it is needed to reduce that resistance. According to an early study of Han (1991) the role of government has been identified as very important component in technology adoption. Government policies about tax and tariff subsidies, other rules regulations, restrictions, incentives and support with regards to a particular technology play an important role in adoption or rejection of any technology. Conclusion: supermarkets have to consider many factors when incorporating a stock monitoring technique but most importantly, the method should be economical, able to serve the customers effectively and be socially acceptable.

2.9 Early Expectations of Supermarket Takeover:

Though distinctions are made between countries, regions, and types of food products, recurring themes in the supermarket revolution literature have been the “rapid rise” of supermarkets, the difficulty of smaller retailers to compete with them, the difficulty of small processors to compete with large processors for the new “supermarket market”, and the urgent need to deal with the exclusion of smallholders from the supermarket channel. Until very recently, conditions for supermarket expansion in Africa have been seen to lag but not to differ fundamentally from those in other regions of the developing world; Africa has been portrayed as a later “wave” in the surge of supermarket expansion, with “take-off” having already occurred in East and Southern Africa and beginning in West Africa (Reardon et al, 2004).

CHAPTER THREE

SYSTEM PROFILE

3.1 Project profile

Our project is considering supermarket management system in an electronic instead of physical shopping in order to perform that. We are giving you some information and introduction about, supermarket, management, and system.

3.1.1 Supermarket

A large shop which sells most types of food, household and other goods needed in the home, in which people take from shelves the things they want to buy and pay for them as they leave. The traditional supermarket occupies a large amount of floor space, usually on a single level. It is usually situated near a residential area in order to be convenient to consumers.

3.1.2 Management

Management is a universal phenomenon. It is a very popular and widely used term. All organizations - business, political, cultural or social are involved in management because it is the management which helps and directs the various efforts towards a definite purpose.

3.1.3 System

A set of detailed methods, procedures and routines created to carry out a specific activity, perform a duty, or solve a problem.

All systems have inputs, outputs and feedback mechanisms.

3.1.4 Supermarket Management System

This System is aimed to provide information to the customer about the product and services of the supermarket of the country. In particular scenario, the customer could have to access internet. And he can input his/her product details or services according to his/her need.

The web interface is provided some searching criteria and filters (town, substituting product) that allows user to ease the search process about the searching criteria.

When the user finished input, the system will show the result according to the searching criteria. And it provides some details about the product/service such as the price, available stock; discount and etc.

3.2 Current System

Currently in most of our supermarkets do not use computers for performing their daily tasks. There are a limited number of supermarkets that use Microsoft Office products, such as Ms. Word and Ms. Excel for performing their daily inventory tasks. Most of them do not even have the information that computers can make a great difference in the way they are doing their tasks when they are programmed to do so.

Today in Somalia supermarkets all the tasks and calculations are being done manually and paper based. In both of the tasks the salesperson and the customers are involved.

In the existing system all transactions, dealings of products, purchasing of products were done manually which time consuming.

Reports are prepared manually as and when needed. Maintaining of reports is very tedious task.

3.3 Data gathering

Is a collection of faithful information about the old system and its essential step, because we easily find out the required information of current system unless we accomplish it.

To collect information we used Interview from supermarkets using manual system and customers.

After when we finish our interview we have got the following result.

- The customer's data and registration are kept manually.
- It took long time customers to get their order.
- Salesperson spend time to know whether items available or not and some time the price of the item.
- It is difficult admin to control the transactions and Summarize data and writing reports take lot of time.
- It takes longer to find old records because admin is just retrieving them from a database.

3.4 Problem Statement

In today's fast paced society, it's very hard to be competitive without using cutting-edge technology available in market. After years of business, the data has grown much.

It is becoming a challenge for person to manage that data in an effective way. To be more productive in order processing, he needs a solution which can facilitate their current processes with use of technology and software.

With increased amount of orders, it is becoming difficult for salesperson to manage orders in effective and efficient manner. It is very hard to go through all paper work and backtracking orders. If there is any complain or review of any order, it takes large amount of effort and time to backtrack and fix the problem. This results in loss of resources, increased time, and low output.

Drawback s of Manual System (Current System)

- **Time consuming:** Getting the required information from the available data takes a lot of time. Changing, editing and updating the information contained in several files are a slow and time consuming process.
- **Poor communication:** a manual system requires employees and managers to write down each time an item is removed from the inventory. If one employee forgets to mention that the last coffee product has been removed from the inventory the admin or manager expects the item to still available for a customers during sale.
- **Need of Effort:** In manual system, an Item's record is maintained in separate files so it takes much effort to collect data from several Stores for and if we want to change or delete the data of any transaction then it has to be changed or deleted from all the files and places it stored.
- **Needs Large Space:** In manual work done data item has to be stored at several places, similarly student's record is maintained in separate registers. It requires more storage space.

3.5 Proposed System

3.5.1 Overview

The proposed system is intended to provide the facility of automating the inventory tasks such as product management and customer registration for the supermarket. To reduce the bottlenecks of the existing system there is a need to develop a new system. The new system should concern the requirements of the customer and the sellers. This project is designed with a goal to making the existing system more informative, reliable, fast and easier. There are many reasons for the starting of the project because in the selling of items through the manual system of salesperson faces a lot of inefficiencies. It requires handling of large record books that consist of both irrelevant and important information's thus making it difficult to find out the required information as per necessity. To overcome these problems in existing system we develop **“SUPERMARKET ADMINISTRATIONMANAGEMENT SYSTEM”**.

3.5.2 Benefits of proposed system

- **Save time and energy:** This system facilitates the admin person to know items that are available the number of items that we have. Also system will facilitate customers to make order of items they need and paying the money using payment cards or cash.
- Can provide Quality of service to customers and store details of customers for further feedback.
- **Speed and Efficiency:** A computerized supermarket management system makes everything from inputting information to taking inventory easier. Doing a hand count of inventory can take days, but with a computerized inventory management system, the same process can be done in a matter of hours.
- **Document Generation:** Once the computerized supermarket management system is in place, managers and workers can use it to automatically generate all kinds of documents, from purchase orders and checks to invoices and account statements. Managers can also use the system to automatically order products when they run low.
- Entire system will be automated. Managers can analyze sales on daily and monthly bases

CHAPTER FOUR

FEASIBILITY STUDY

Feasibility study is a process of analyzing and identifying if a problem can be solved or not solved, focusing on helping answer the essential question of “should we continue the proposed project ideas?” All activities of the study are directed toward helping answer this question.

A Feasibility Study is generic in nature and can be applied to any type of project, be it for systems and software development, making an acquisition, or any other project. We can test our system by different type of the feasibilities.

There are basically six parts to any effective Feasibility Study:

- (1) **The Project Scope** which is used to define the business problem and/or opportunity to be addressed. The old adage, "The problem well stated is half solved," is very apropos. The scope should be definitive and to the point; rambling narrative serves no purpose and can actually confuse project participants.
- (2) **The Current Analysis** is used to define and understand the current method of implementation, such as a system, a product, etc. From this analysis, it is not uncommon to discover there is actually nothing wrong with the current system or product other than some misunderstandings regarding it or perhaps it needs some simple modifications as opposed to a major overhaul.
- (3) **Requirements** - how requirements are defined depends on the object of the project's attention. For example, how requirements are specified for a product is substantially different than requirements for an edifice, a bridge, or an information system.
- (4) **The Approach** represents the recommended solution or course of action to satisfy the requirements
- (5) **Evaluation** - examines the cost effectiveness of the approach selected. This begins with an analysis of the estimated total cost of the project.
- (6) **Review** - all of the preceding elements are then assembled into a Feasibility Study and a formal review is conducted with all parties involved.

There are 5 types of the feasibilities which are discussed here. These are as follows:

4.1 Technical Feasibility:

A study of resources availability that may affect the ability to achieve an acceptable system. This evaluation determines whether the technology needed for the proposed system is available or not. This system can be made in any language that support good user interface and easy database handling.

4.2 Economic feasibility

Analysis of a project's costs and revenues in an effort to determine whether or not it is logical and possible to complete.

This part of feasibility study gives the top management the economic Justification for the new system.

Table 4.2 Economical feasibility

Item	Minimum	Maximum
Hard ware	\$560	\$850
Soft ware	\$130	\$ 200
Trainers	\$300	\$ 450
Total	\$990	\$1,500

4.3 Operational Feasibility:

In this feasibility we consider following points:

1. What changes will be brought with the system.
2. What new skills will be required? Do the existing staff members have these skills? If not, can they be trained in due course of time?

In the new system there is something new so sales person and other staff they have to be trained to use the newly added facilities. These major changes are possible and give a new era in the Supermarket in production and sales management. We will make some changes this system in a future, we want to make online which any one can log in and access as they are in their home

4.4 Schedule Feasibility:

Time evaluation is most important consideration in development of the project.

So the project is concerned should be completed with fixed in scheduled time as far as company is concerned. New system took us to complete four months.

Table 4.4 Schedule feasibility

No	Scheduled task	Duration
1	Analysis phase	3 weeks
2	Design phase	4 weeks
3	Building phase	5 weeks
4	Testing and Implementation phase	3 week
5	Total	16 week

4.5 Behavioral Feasibility:

People are inherently resisted to change and a computer means “change is the only certainty”. An estimate should be made of how strong a reaction the user staff in going to have towards development of new system. Thus special efforts can be made to educate and train the staff

CHAPTER FIVE

SOFTWARE REQUIREMENTS

SPECIFICATION

5.1 Introduction

System requirements are expressed in a software requirements documents. The software requirements specification is an official statement of is required of the system developers. This requirements document includes the requirements definition and the requirement specification. The software requirement document is not design document. It should set out what the system should do without specifying how it should be done.

First you must think to ensure that you have all the relevant tools required to develop the system such as hardware and software tools.

5.2 User class and characteristics

There are two users in this system

Administrator

User

Administrator

- Admin person can add, edit and delete items
- Admin person creates users of the system giving some authority but not all.
- Admin person controls daily sells and feedbacks from customers.
- View the history of the customers who purchased the items.
- The main role of the administrator is to safeguard the database and can add/delete the products from the database.

User

User (Sales person) has a power given by the admin person, he will do the authority given. He cannot change anything from the system.

- Manage daily transactions and put into the computer.
- Sale items and put data into the system.
- Register new customers.

5.3 External interface requirements

Our requirements in this system are those below.

5.3.1 Hardware Interface:

Table 5.3.1 Hardware interface

Hardware Requirements			
Item no.	Item Name	Minimum	Maximum
1	RAM	256 MB	1GB
2	PROCESSOR	2.40GHZ	3.6GHZ
3	HARD DISK	40 GB	500 GB

5.3.2 Software Interface:

Table 5.3.2 Software interface

Software Requirements		
Item no.	Item Name	Version
1	Windows	Window 7
2	VB.net	2008
3	MS SQL Server	2008

5.4 Use Case Model

The Use Case Model describes the proposed functionality of the new system. A Use Case represents a discrete unit of interaction between a user (human or machine) and the system. A Use Case is a single unit of meaningful work; for example login to system, register with system and create order are all Use Cases. Each Use Case has a

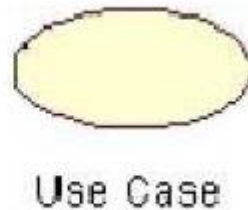
description which describes the functionality that will be built in the proposed system. A Use Case may 'include' another Use Case's functionality or 'extend' another Use Case with its own behavior.

Use Cases are typically related to 'actors'. An actor is a human or machine entity that interacts with the system to perform meaningful work. A use case diagram displays the relationship among actors and use cases

The two main components of a use case diagram are use cases and actors.

Actor

An Actor is a user of the system. This includes both human users and other computer systems. An Actor uses a Use Case to perform some piece of work which is of value to the business. The set of Use Cases an actor has access to define their overall role in the system and the scope of their action.



Use case is an external view of the system that represents some action the user might perform in order to complete a task.

Use case properties

Stake holder: anyone interested in the system examples: supplier, stock agency, and vendor.

Primary actor: initiates interaction to achieve goal (when system is a software product, primary actor is often the computer user)

Goal: action that actor wants to accomplish

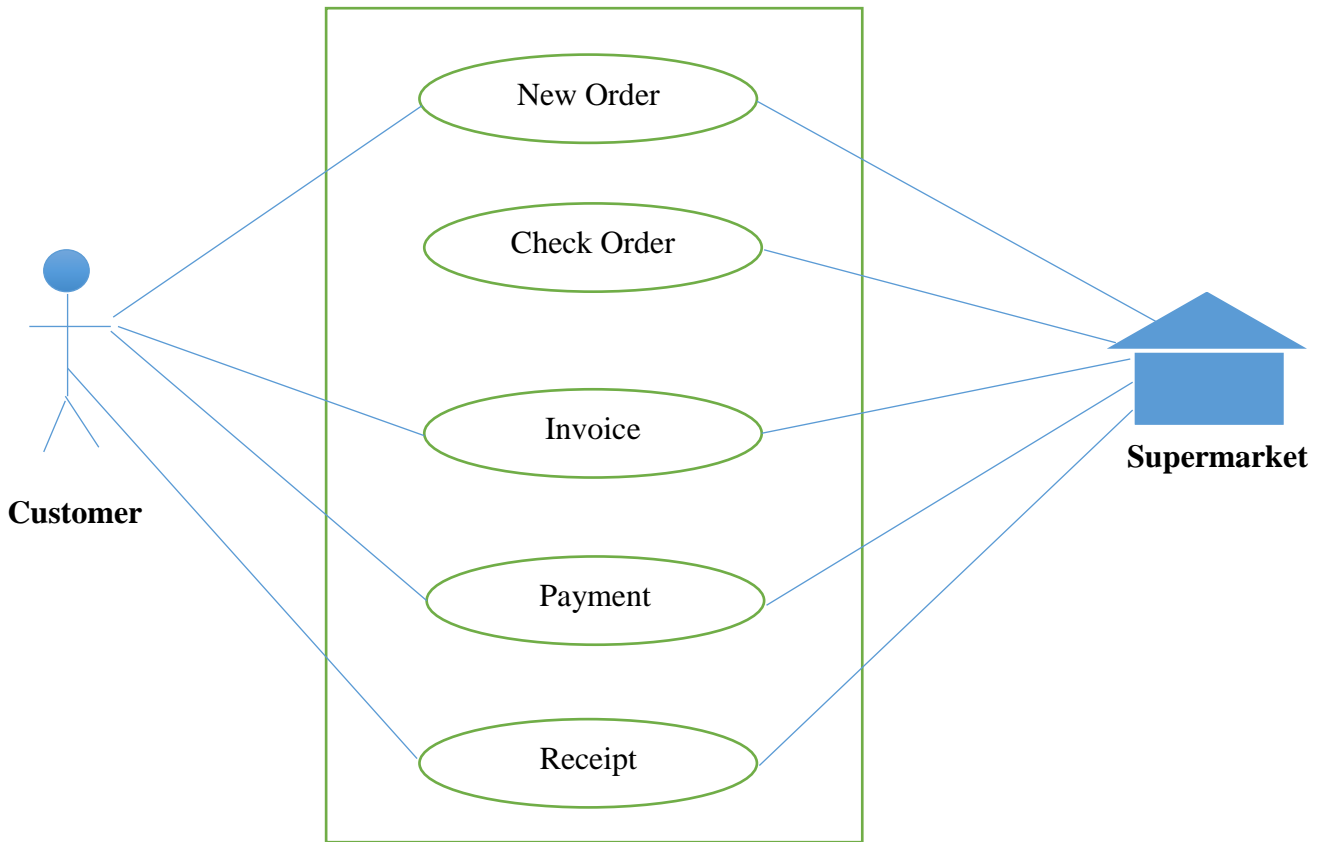


Fig. 5.4 Customer use case diagram in supermarket

5.4.1 Admin diagram in supermarket using use case model

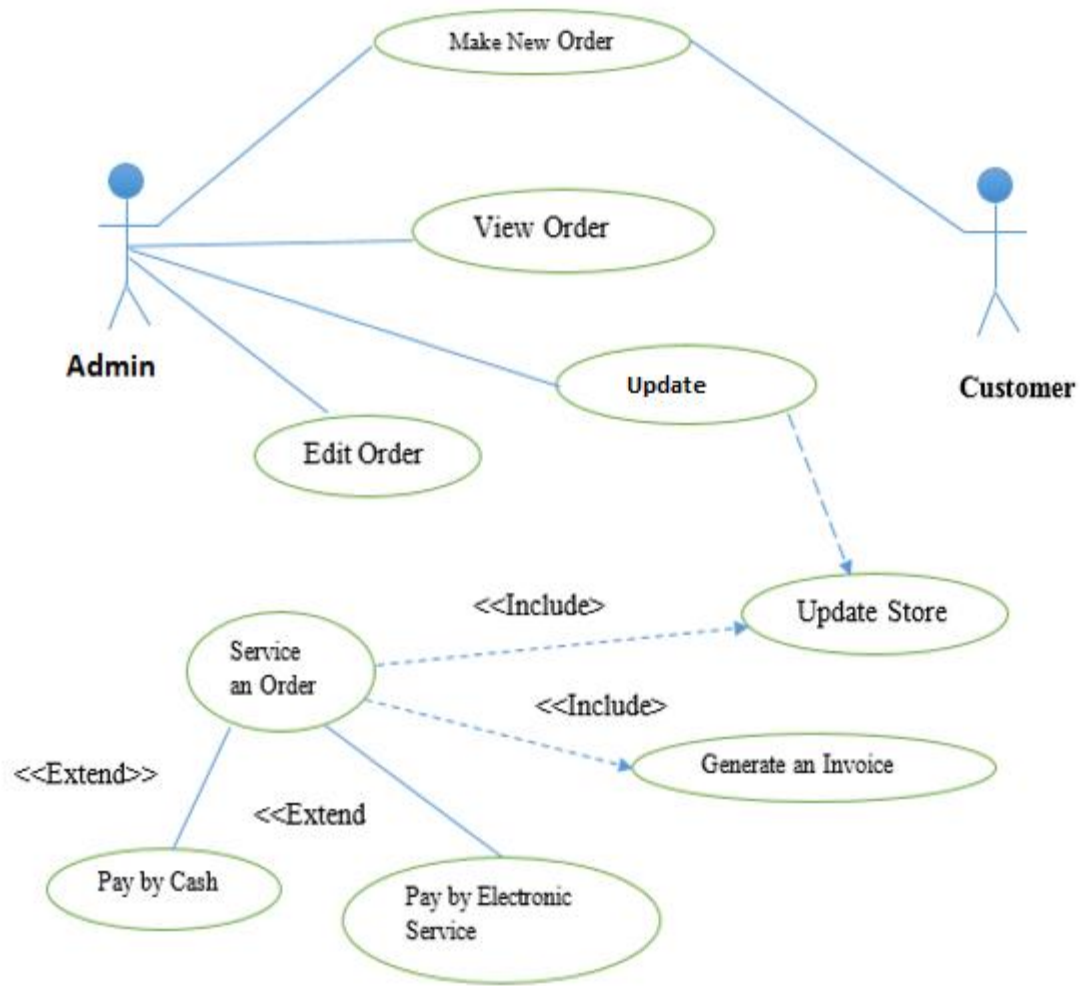
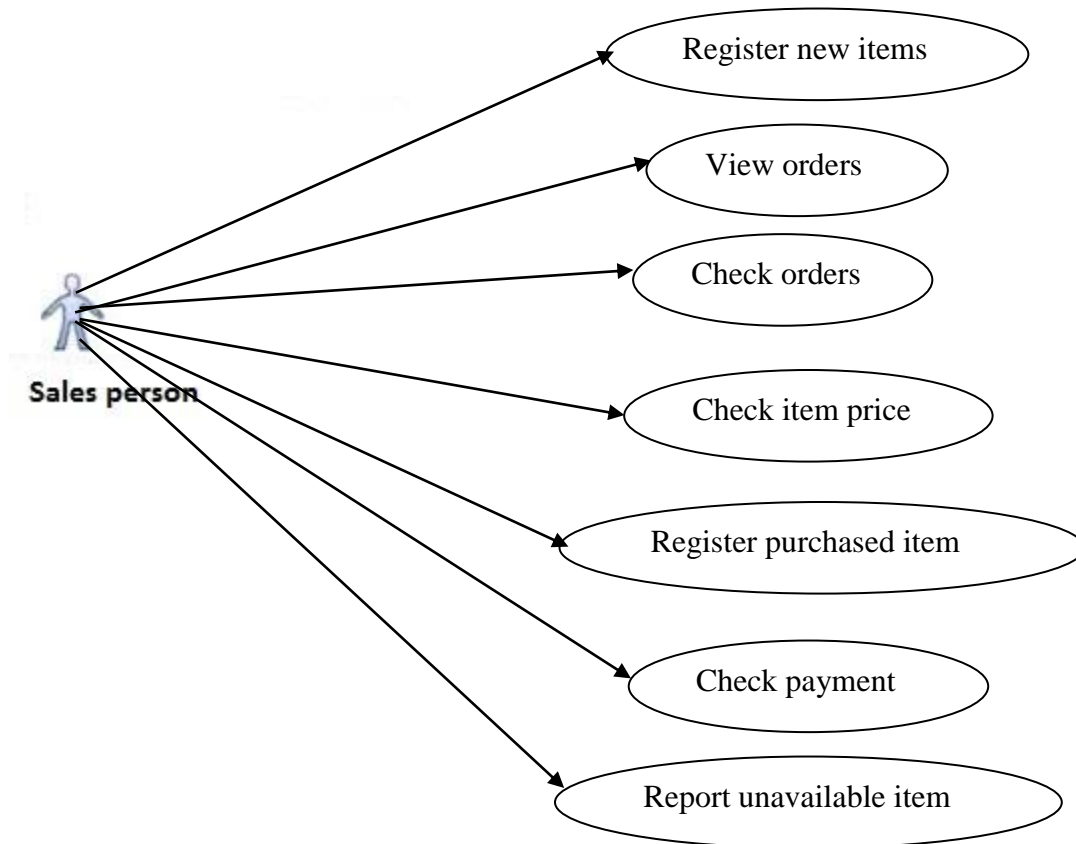


Fig. 5.4.1 Admin use case in supermarket

5.4.2 User (Sales person) supermarket use case diagram



5.4.2 Use case diagram in supermarket

5.4.3 Supermarket system diagram using use case model

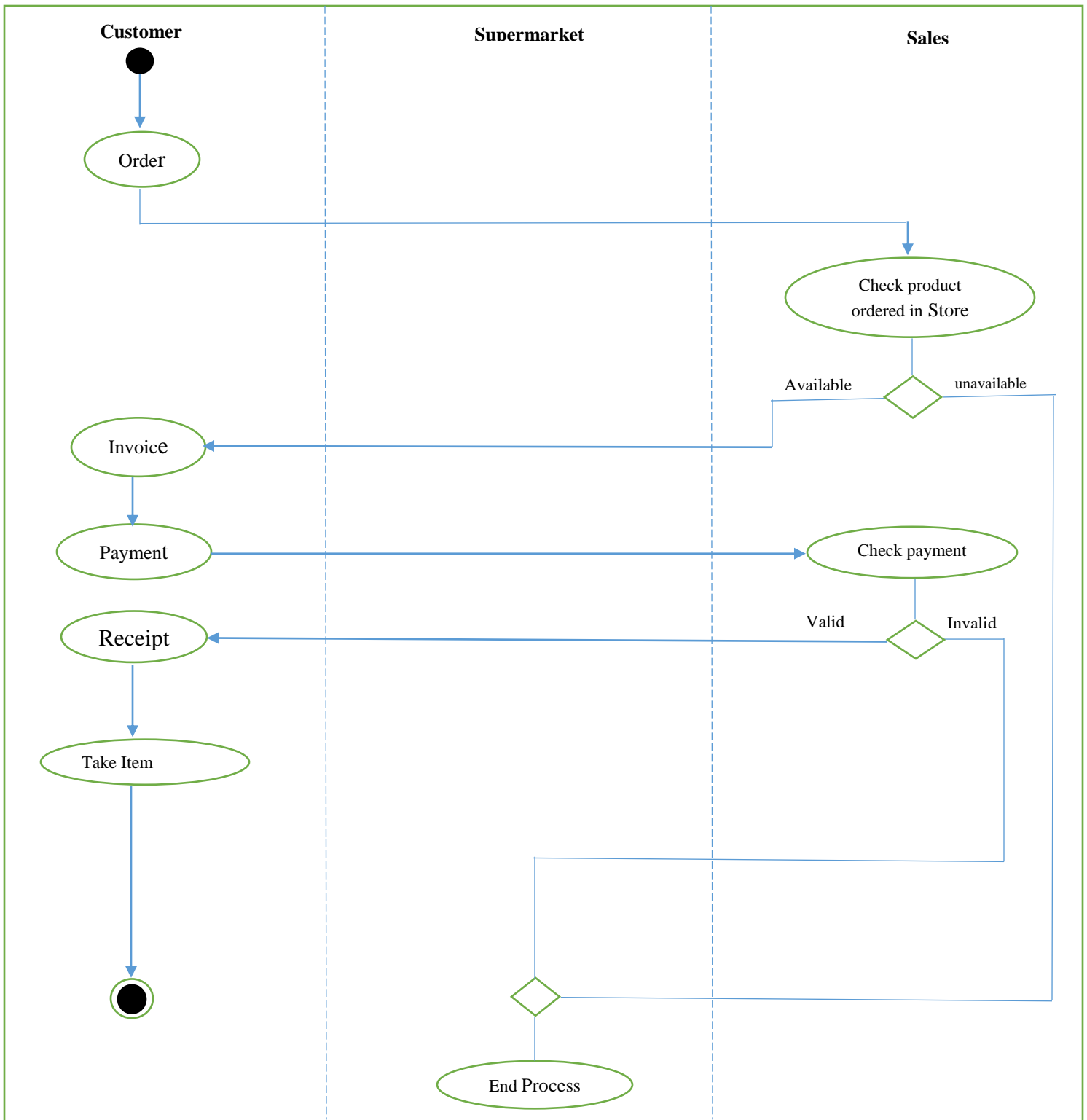


Fig. 5.4.3 Supermarket system use case diagram

CHAPTER SIX

SYSTEM DESIGN ARCHITECTURE

6.1 System Design

Design is the first step in the development phase for any system. It may be defined as a “the of applying various techniques and principles for the purpose of defining a device, a process, or a system insufficient detail to permit its physical realization”

System design is the process of defining the elements of a supermarket system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system.

Design will play a bigger role in every project; therefore having a good design is needed to have enough information. In order to design a system, the relational database must be designed first

The design phase begins with an initial three-step process:

- Project Idea
- Project Concept
- Appraisal

6.2 Project Idea

This stage is the preliminary, informal conceptualization and vetting of a project idea among Colleagues within, and perhaps also outside,

6.3 Project Concept

Once a project idea has been agreed upon, a project concept paper should be developed in order to flesh out the idea, and enable those responsible for appraising the concept to determine whether the proposed undertaking is viable, fits with perceived conservation needs.

A project concept paper is essentially a brief conceptualization of a project intervention prepared prior to a feasibility study and ultimately a full, participatory project design undertaking.

Developing a project concept involves the initial formulation of project goals, targets, outputs, and activities in summary form within the framework of the WWF Global Priorities. The project budget should be an informed estimate, which at this stage should aim for 80 per cent accuracy.

6.4 Project Appraisal

The appraisal is an internal examination of the merits and feasibility of the project and its fit within strategic priorities and goals.

6.5 Description of tools used:

The tools used in designing ordering and inventory system of supermarket are.

6.5.1 Front end system design

Front-end is term used to characterize program interfaces and services relative to the initial user of these interface and service. (The "user" may be a human being or a program.) A "front-end" application is one that application users interact with directly.

Front-End means a language that is used for user interface designing and coding. We used our front end visual basic 2008.

Visual Basic (VB) has become such a popular programming language for several reasons. VB is easy to learn, which makes it an excellent tool for understanding elementary programming concepts. In addition, it has evolved into such a powerful and popular product that skilled Visual Basic programmers are in demand in the job market.

Visual Basic is fully object-oriented and compatible with many other languages using the .NET Framework. This book incorporates the object-oriented concepts throughout, as well as the syntax and terminology of the language.

Visual Basic is designed to allow the programmer to develop applications that run under Windows and/or in a Web browser without the complexity generally associated with programming. With very little effort, the programmer can design a screen that holds standard elements such as buttons, check boxes, radio buttons, text boxes, and list boxes. Each of these objects operates as expected, producing a "standard" Windows or Web user interface.

A brief description of Visual Basic 2008:

Visual Basic has gone through many phases of development since the days of BASIC that was built for DOS. BASIC stands for Beginners' All-purpose Symbolic Instruction Code. The program code in Visual Basic resembles the English language. Different software companies had produced many different versions of BASIC for DOS, such as Microsoft QBASIC, QUICKBASIC, GWBASIC, and IBM BASICA and more. Then, Microsoft launched

the first graphical BASIC which was known as Visual Basic Version1 in 1991. It is GUI based and especially developed for MS window.

Since then the DOS versions of BASIC were slowly phased out and almost completely replaced by Visual Basic.

Visual Basic was initially a functional or procedural programming language until the popular Visual Basic 6. Then, Microsoft decided to make Visual Basic into more powerful object oriented programming language, Visual Basic 2005 was launched with that purpose in mind. Visual Basic 2005 is an object oriented programming language and it was to be taken over by Visual Basic 2008. Visual Basic 2008 is a full-fledged Object-Oriented Programming (OOP) Language, so it has caught up with other OOP languages such as C++, Java, C# and others. However, you don't have to know OOP to learn VB2008. In fact, if you are familiar with Visual Basic 6, you can learn VB2008 effortlessly because the syntax and interface are almost similar.

6.5.2 Back end system design

A "back-end" application or program serves indirectly in support of the front-end services, usually by being closer to the required resource or having the capability to communicate with the required resource. The back-end application may interact directly with the front-end or, perhaps more typically, is a program called from an intermediate program that mediates front-end and back-end activities.

Back-End means a language that is used for database management.

We used and implemented the back end of this system MySQL 2008, which is relational database management system RDMS, because of popularity and strong security.

MySQL is an open source database management system. The features of MySQL are given below:

- MySQL is a relational database management system. A relational database stores information in different tables, rather than in one giant table. These tables can be referenced to each other, to access and maintain data easily.
- MySQL is open source database system. The database software can be used and modify by anyone according to their needs.
- It is fast, reliable and easy to use. To improve the performance, MySQL is multithreaded database engine. A multithreaded application performs many tasks at the same time as if multiple instances of that application were running simultaneously.

MySQL can be used for a variety of applications, but is most commonly found on Web servers. A website that uses MySQL may include Web pages that access information from a database. These pages are often referred to as "dynamic," meaning the content of each page is generated from a database as the page loads. Websites that use dynamic Web pages are often referred to as database-driven websites.

Many database-driven websites that use MySQL also use a Web scripting language like PHP to access information from the database. MySQL commands can be incorporated into the PHP code, allowing part or all of a Web page

to be generated from database information. Because both MySQL and PHP are both open source (meaning they are free to download and use), the PHP/MySQL combination has become a popular choice for database-driven websites.

6.6 Conceptual Design

.Conceptual design can be divided into two parts: Data model and Process model.

6.6.1 Data Model

The data model focuses on what data should be stored in the database while the process model deals with how the data is processed. To put this in the context of the relational database, the data model is used to design the relational tables.

6.6.2 Process model

The process model is used to design the queries that will access and perform operations on those tables.

6.6.3 Logical Data Model

A logical data model describes the data in as much detail as possible, without regard to how they will be physical implemented in the database. Features of a logical data model include:

- Includes all entities and relationships among them.
- All attributes for each entity are specified.
- The primary key for each entity is specified.
- Foreign keys (keys identifying the relationship between different entities) are specified.
- Normalization occurs at this level.

The steps we will design the logical data model are as follows:

1. Specifying primary keys for all entities.
2. Finding the relationships between different entities.
3. Finding all attributes for each entity.
4. Resolve many-to-many relationships.
5. Normalization.

Logical Data model

Customers
CustomerID -Varchar(15) Name -Varchar(50) Gender -Varchar(50) Address -Varchar(50) Phone -Int Email -Varchar(50) RegDate -Date
Add New Customer() Update Customer() Delete Customer() Search Customer()

Stores Information
StoreID -Varchar(15) StoreName -Varchar(50) Location -Varchar(50) Size -Int Shelf's -Int
Add New Stores() Update Stores() Delete Stores() Search Stores()

Employees
EmployeeID -Varchar(15) Name -Varchar(50) Gender -Varchar(50) Address -Varchar(50) Phone -Int Email -Varchar(50) Qualification -Varchar(50) BasicSalary -Money RegDate -Date
Add New Employee() Update Employee () Delete Employee () Search Employee ()

Products
ProductID -Varchar(15) ProductName -Varchar(50) ProductType -Varchar(50) Quantity -Int Price -Money Date -Date
Add New Product () Update Product () Delete Product () Search Product ()

Sales
InvoiceID -Varchar(15) CustID -Varchar(15) ProductID -Varchar(15) ProdType -Varchar(50) Quantity -Int Price -Money Discount -Money PayType -Varchar(50) AmountPaid -Money Balance -Money Date -Date
Add New Sales() Update Sales() Delete Sales() Search Sales() DecrementProduct() IncrementCash()

Orders
OrderID -Varchar(15) CustomerID -Varchar(15) ProductID -Varchar(15) ProductType -Varchar(50) Quantity -Int Date -Date
Add New Order() Update Order() Delete Order() Search Order()

Suppliers
SupplierID -Varchar(15) CompanyName -Varchar(50) Address -Varchar(50) Phone -Int Email -Varchar(50) RegDate -Date
Add New Supplier() Update Supplier () Delete Supplier () Search Supplier ()

Purchases
PurchaseID -Varchar(15) SupplierID -Varchar(15) ProductID -Varchar(15) ProductType -Varchar(50) Quantity -Int Price -Money AmountPaid -Money Balance -Money Date -Date
Add New Purchase() Update Purchase() Delete Purchase() Search Purchase() IncrementProduct() DecrementCash()

Users
UserID -Varchar(15) EmployeeIDVarchar(15) UserName -Varchar(50) Password -Varchar(50) UserType -Varchar(50) RegDate -Date
Add New User() Update User() Delete User() Search User()

6.7 Data flow diagram

Data flow diagram (DFD) was first developed by Larry Constantine as way representing system requirements in a graphical form; this lead modular design.

A data flow model is diagrammatic representation of the flow and exchange of information within a system. Data flow models are used to graphically represent the flow of data in an information system by describing the processes involved in transferring data from input to file storage and reports generation

Individuals seeking to draft a data flow diagram must (1) identify external inputs and outputs, (2) determine how the inputs and outputs relate to each other, and (3) explain with graphics how these connections relate and what they result in. This type of diagram helps business development and design teams visualize how data is processed and identify or improve certain aspects.

6.7.1 Customer Data flow diagram



Fig. 6.7.1 Customer Data flow diagram

6.7.2 Admin Data flow diagram

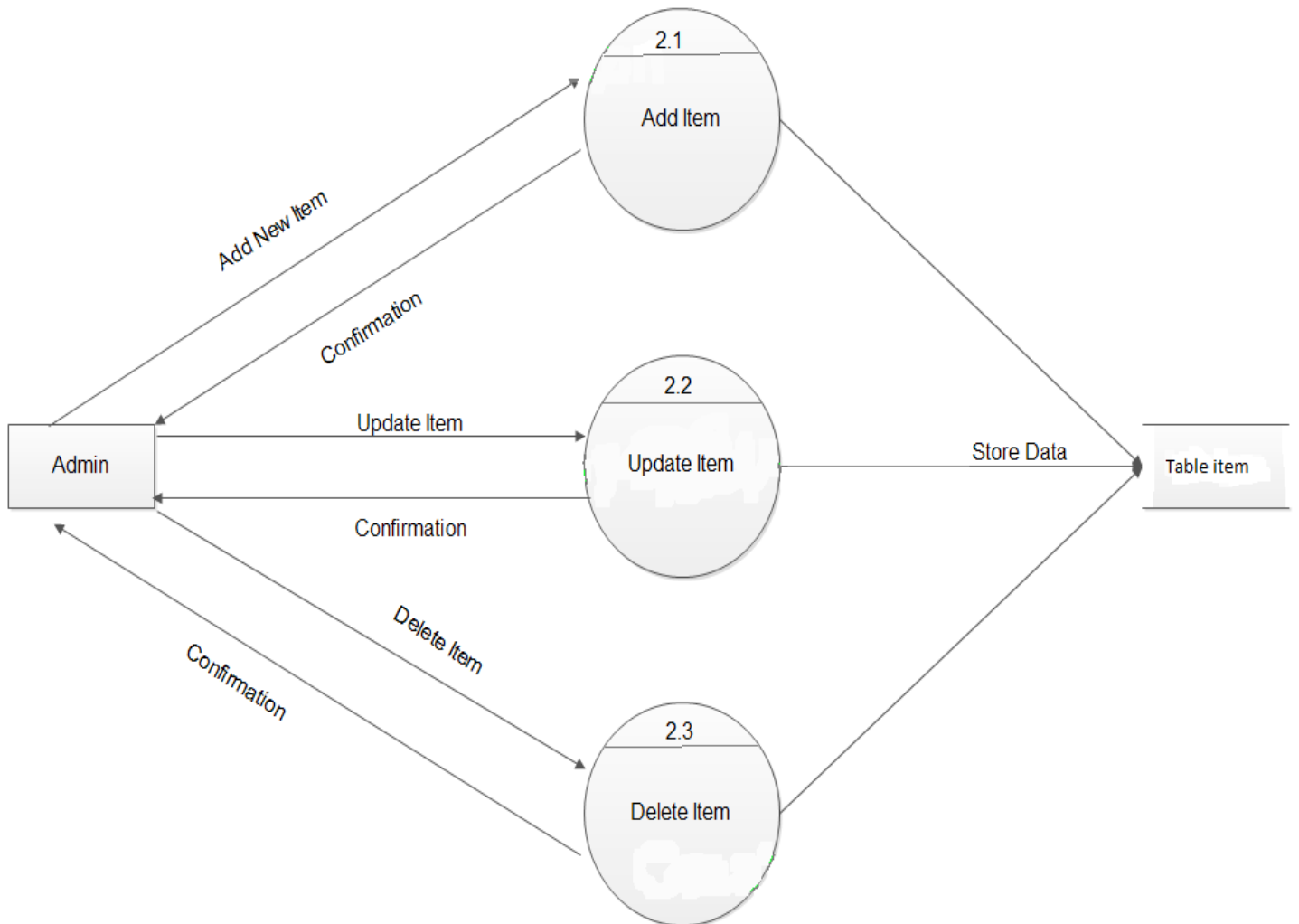


Fig. 6.7.2 Admin Data flow diagram

6.8 Entity Relationship

An entity-relationship also called (ER) diagram, a graphical representation of entities and their relationships to each other, typically used in computing in regard to the organization of data within databases or information systems. An entity is a piece of data-an object or concept about which data is stored.

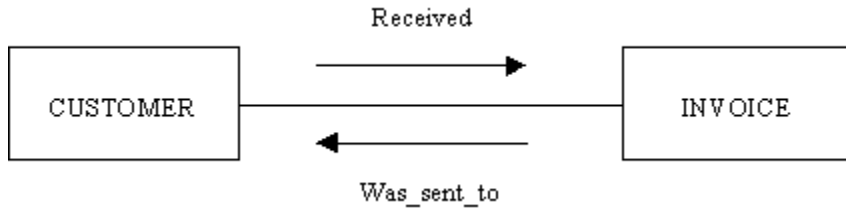


Fig. 6.8 Entity-relationship diagrams.

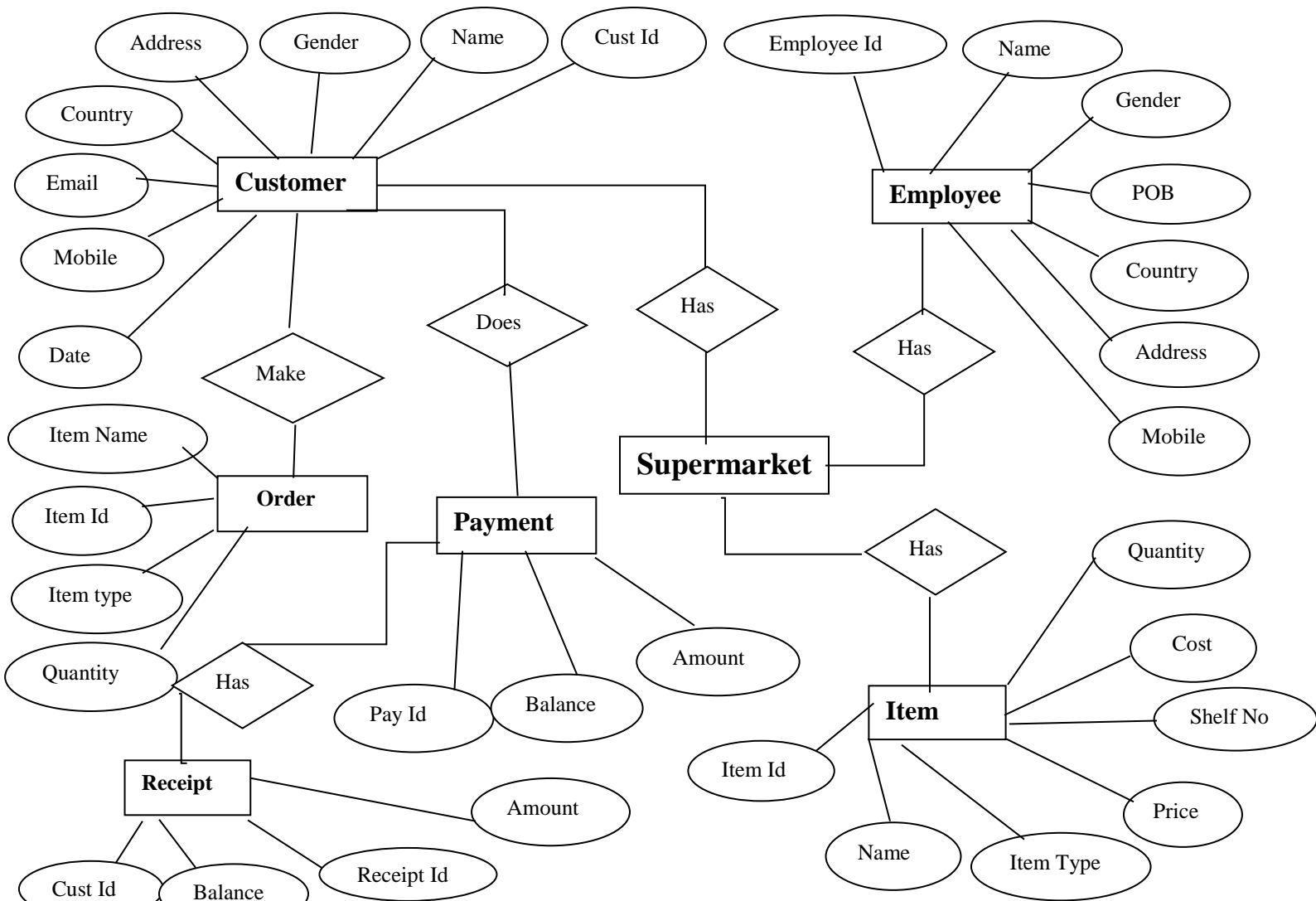


Fig 6.9 Supermarket entity diagram

A relationship is how the data is shared between entities. There are three types of relationships between entities:

6.8.1 One-to-One

One instance of an entity (A) is associated with one other instance of another entity (B). For example, in a database of employees, each employee name (A) is associated with only one social security number (B).

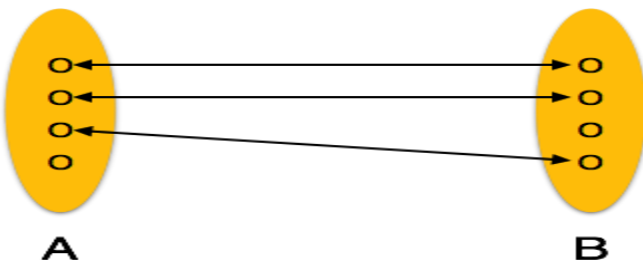


Fig. 6.8.1 One to one entity relationship diagram

6.8.2 One-to-Many

One instance of an entity (A) is associated with zero, one or many instances of another entity (B), but for one instance of entity B there is only one instance of entity A. For example, for a company with all employees working in one building, the building name (A) is associated with many different employees (B), but those employees all share the same singular association with entity A.

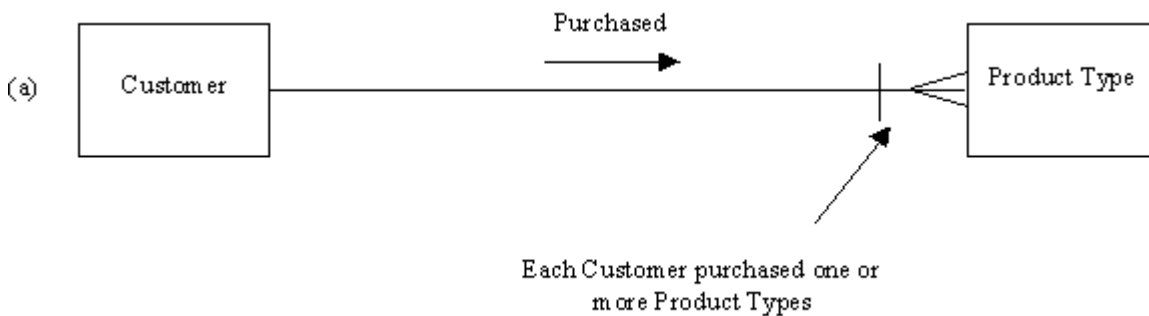


Fig. 6.8.2 One to many entity relationship diagram

6.8.3 Many-to-Many

One instance of an entity (A) is associated with one, zero or many instances of another entity (B), and one instance of entity B is associated with one, zero or many instances of entity A. For example, for a company in which all of its employees work on multiple projects, each instance of an employee (A) is associated with many instances of a project (B), and at the same time, each instance of a project (B) has multiple employees (A) associated with it.

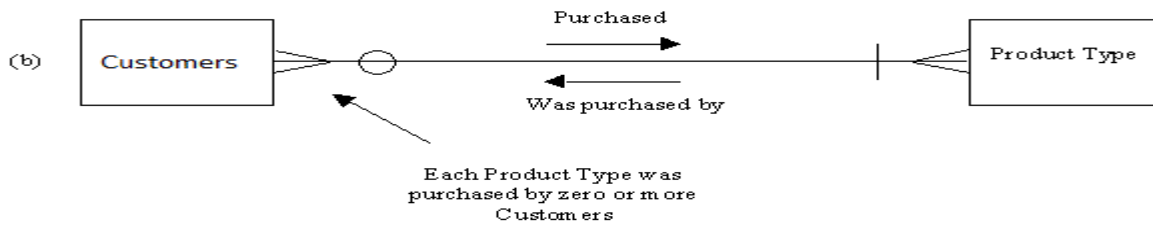


Fig. 6.8.3 Many to Many entity relationship diagrams

CHAPTER SEVEN

SOFTWARE DEVELOPMENT LIFE CYCLE

7.1 Software

Software is set of instructions, data or anything that can be stored electronically. Software consists of carefully-organized instructions and code written by programmers in any of various special computer languages.

Software is often divided into two categories.

- (1) Systems software: includes the operating system and all the utilities that enable the computer to function.
- (2) Applications software: includes programs that do real work for users. For example, word processors, spreadsheets, and database management systems fall under the category of applications software.

7.2 Software Development

Software development is the development of a software product. The term "software development" may be used to refer to the activity of computer programming, which is the process of writing and maintaining the source code, but in a broader sense of the term it includes all that is involved between the conception of the desired software through to the final manifestation of the software, ideally in a planned and structured process.

7.3 Software development methodology

A software development methodology or system development methodology is a framework that is used to structure, plan, and control the process of developing an information system. Common methodologies include waterfall, prototyping, iterative and incremental development, spiral development, rapid application development, and extreme programming.

7.4 Software development life cycle

The **systems development life cycle (SDLC)**, also referred to as the application development life-cycle, is a term used in systems engineering, information systems and software engineering to describe a process for planning, creating, testing, and deploying an information system. These are the models of SDLC.

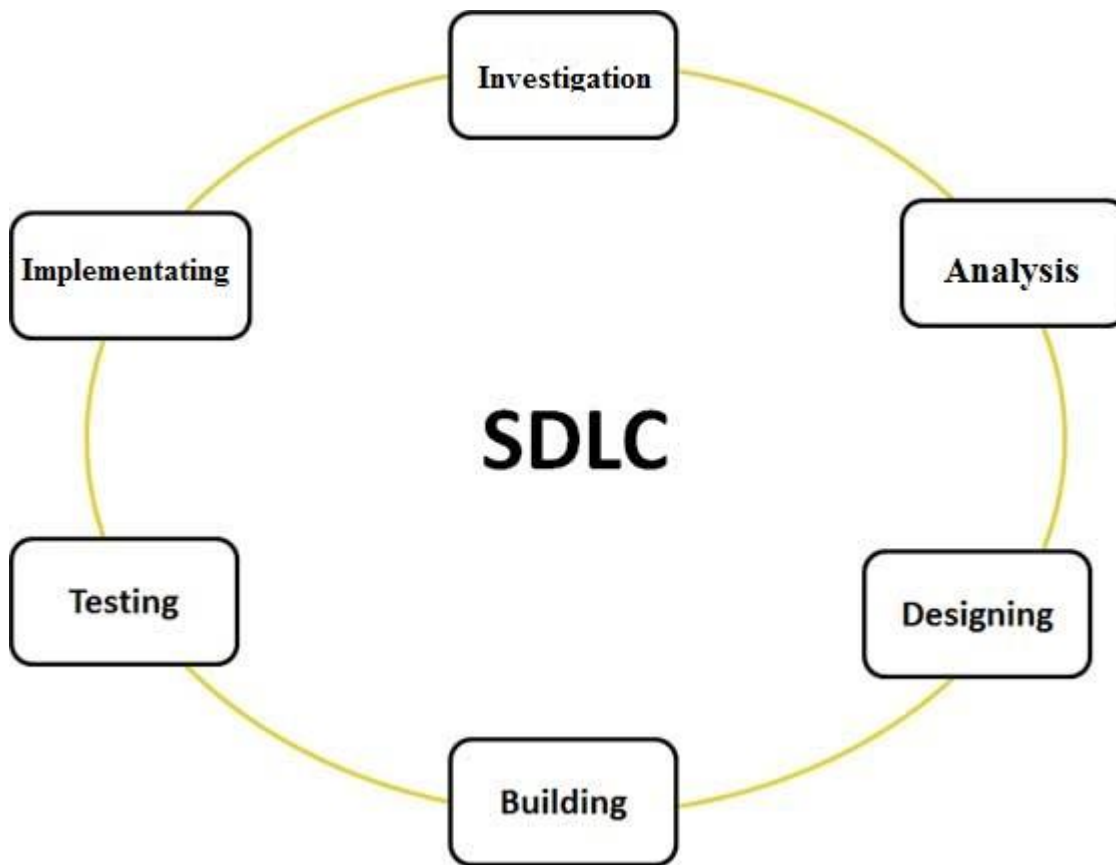


Fig. 7.4 Software development life cycle

7.4.1 Waterfall model

The Waterfall Model was first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each phase must be completed fully before the next phase can begin. At the end of each phase, a review takes place to determine if the project is on

the right path and whether or not to continue or discard the project. In waterfall model phases do not overlap. We use waterfall model when we have clear requirements because we cannot go back into the previous step.

The problem is once an application is in the testing stage, it is very difficult to go back and change something that was not well-thought out in the concept stage.

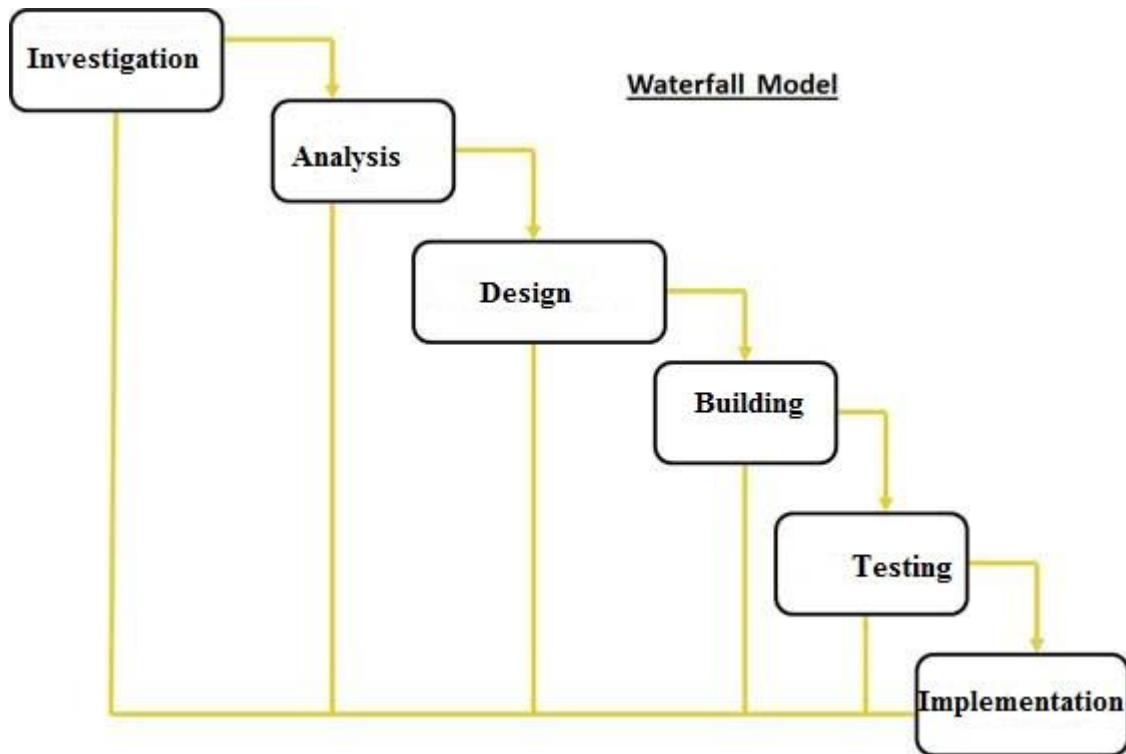


Fig. 7.4.1 Waterfall model

Advantages of waterfall model:

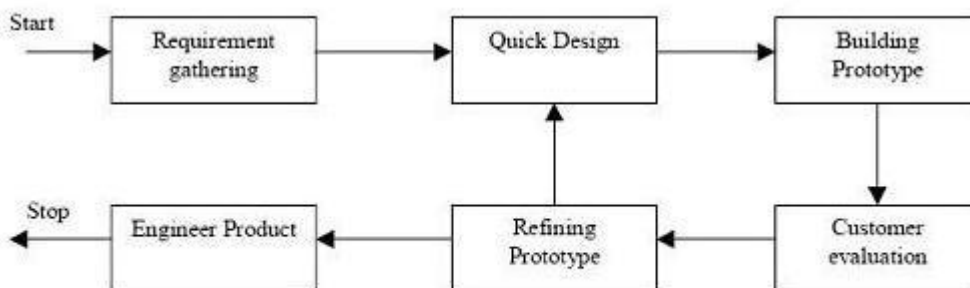
- Simple and easy to understand and use.
- Easy to manage due to the rigidity of the model – each phase has specific deliverables and a review process.
- Phases are processed and completed one at a time.
- Works well for smaller projects where requirements are very well understood.

When to use the waterfall model:

- Requirements are very well known, clear and fixed.
- Product definition is stable.
- Technology is understood.
- There are no ambiguous requirements
- Ample resources with required expertise are available freely
- The project is short.

7.4.2 Prototype model

Prototyping is an attractive idea for complicated and large systems for which there is no manual process or existing system to help determining the requirements. The prototype is usually not complete systems and many of the details are not built in the prototype. The goal is to provide a system with overall functionality.



Prototyping Model

Fig. 7.4.2 Prototype model

Advantages of Prototype model:

- Users are actively involved in the development
- Since in this methodology a working model of the system is provided, the users get a better understanding of the system being developed.
- Errors can be detected much earlier.
- Quicker user feedback is available leading to better solutions.
- Missing functionality can be identified easily

When to use Prototype model:

- Prototype model should be used when the desired system needs to have a lot of interaction with the end users.
- Typically, online systems, web interfaces have a very high amount of interaction with end users, are best suited for Prototype model. It might take a while for a system to be built that allows ease of use and needs minimal training for the end user

7.4.3 Spiral model

The spiral model is similar to the incremental model, with more emphasis placed on risk analysis. The spiral model has four phases: Planning, Risk Analysis, Engineering and Evaluation. A software project repeatedly passes through these phases in iterations (called Spirals in this model). The baseline spiral, starting in the planning phase, requirements is gathered and risk is assessed. Each subsequent spiral builds on the baseline spiral. **Requirements** are gathered during the planning phase. In the **risk analysis phase**, a process is undertaken to identify risk and alternate solutions. A prototype is produced at the end of the risk analysis phase.

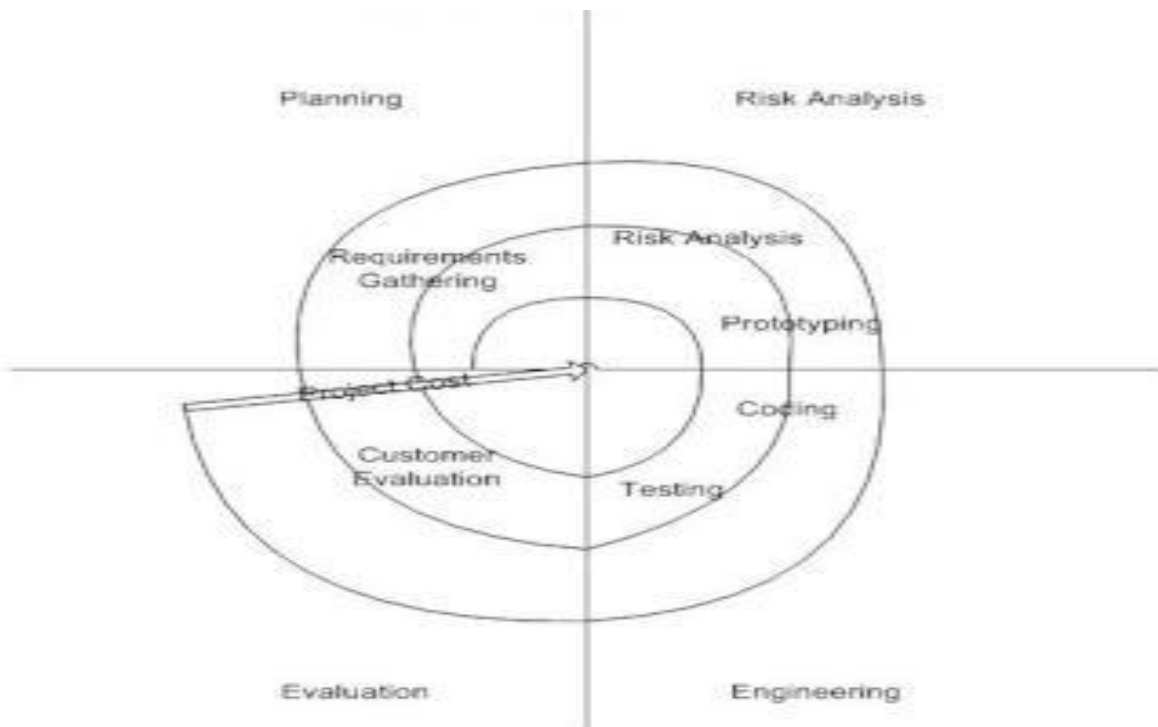


Fig. 7.4.3 Spiral model

Advantages of Spiral model:

- High amount of risk analysis hence, avoidance of Risk is enhanced.
- Good for large and mission-critical projects.
- Strong approval and documentation control.
- Additional Functionality can be added at a later date.

When to use Spiral model:

- When costs and risk evaluation is important
- For medium to high-risk projects
- Long-term project commitment unwise because of potential changes to economic priorities
- Users are unsure of their needs
- Requirements are complex
- New product line
- Significant changes are expected (research and exploration)

7.4.4 Incremental Model

In incremental model the whole requirement is divided into various builds. Multiple development cycles take place here, making the life cycle a “multi-waterfall” cycle. Cycles are divided up into smaller, more easily managed modules. Each module passes through the requirements, design, implementation and testing phases. A working version of software is produced during the first module, so you have working software early on during the software life cycle. Each subsequent release of the module adds function to the previous release. The process continues till the complete system is achieved.

For example:



Fig. 7.4.4 Incremental model

In the diagram above when we work **incrementally** we are adding piece by piece but expect that each piece is fully finished. Thus keep on adding the pieces until it's complete.

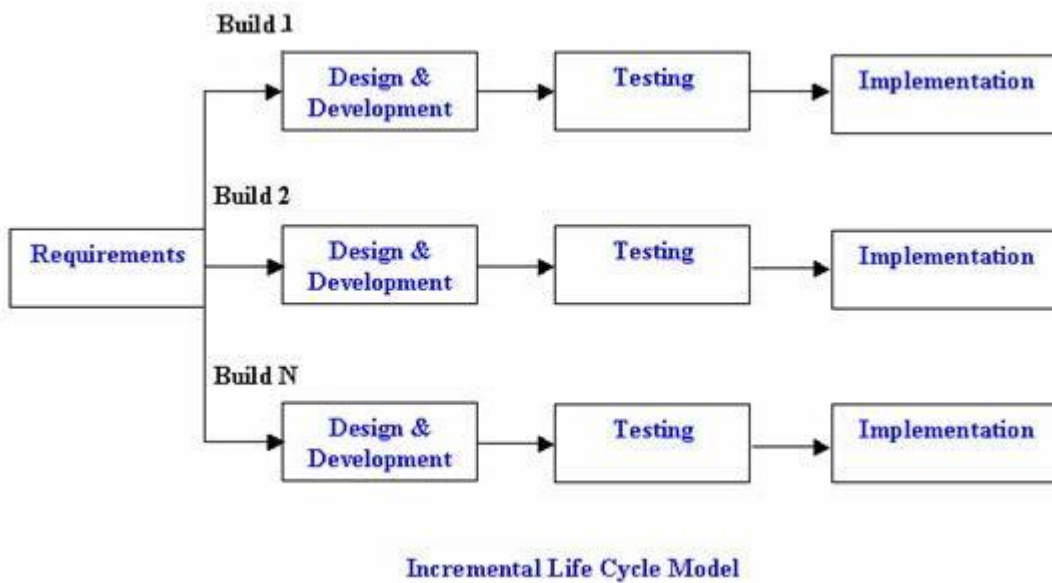


Fig. 7.4.4 Incremental life cycle model

Advantages of Incremental model:

- Generates working software quickly and early during the software life cycle.
- More flexible – less costly to change scope and requirements.
- Easier to test and debug during a smaller iteration.
- Customer can respond to each built.
- Lowers initial delivery cost.
- Easier to manage risk because risky pieces are identified and handled during it'd iteration.

When to use the Incremental model:

- Requirements of the complete system are clearly defined and understood.
- Major requirements must be defined; however, some details can evolve with time.
- There is a need to get a product to the market early.
- A new technology is being used
- Resources with needed skill set are not available
- There are some high risk features and goals.

CHAPTER EIGHT

TESTING AND IMPLEMENTATION

8.1 Testing

The testing phase is the stage that follows the implementation of the program with the aim to verify whether it responds to the existing problem or it does what it has to do.

It also involves the examination of the functionality of program in general to ensure that the software responds to the needs of the users.

This will verify the performance of the program in matters of security and portability. The bottom line is that the software should be delivered, not only working correctly but also satisfying other attributes such as usability and maintainability. The following test methods were used to try to uncover all possible errors and verify that the system fully satisfies its requirements. It is worth mentioning that we have tried to follow the best practices suggested by all software engineering researchers.

8.2 Software testing

It is the process of testing the functionality and correctness of software by running it. Process of executing a program with the intent of finding an error. A successful test is one that uncovers an as yet discovered error.

Software testing is usually performed for one of two reasons

- Defect detection
- Reliability estimation

8.3 Basics of software testing

There are two basics of software testing: black box testing and white box testing.

8.3.1 White box Testing

White box testing is a testing technique that occurs into each and every part of the program. It is also called structural testing and glass box testing. White box testing is often used for verification.

8.3.2 Black box Testing

Black box testing is a testing technique that ignores the internal mechanism of the system and focuses on the output. It is also called functional testing. Black box testing is often used for validation.

8.4 Testing objectives

The main aim of testing is to uncover a host of an errors, systematically and with a minimum effort and time. As he good testing case is one that has high probability of finding errors, if it exists. But there is one thing that testing cannot do testing cannot show the absence of defects it can only show that the software defects are present.

8.5 Testing methodology

In order to uncover the errors present in the different phases we have the concept of levels of testing.

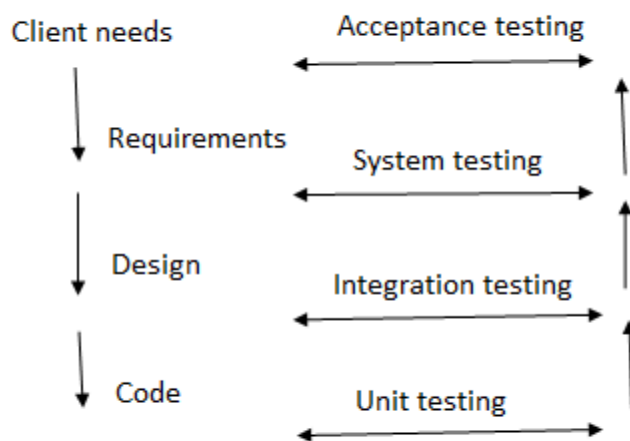


Fig 8.5 Level of testing

8.6 Types of testing

There are many types of testing like

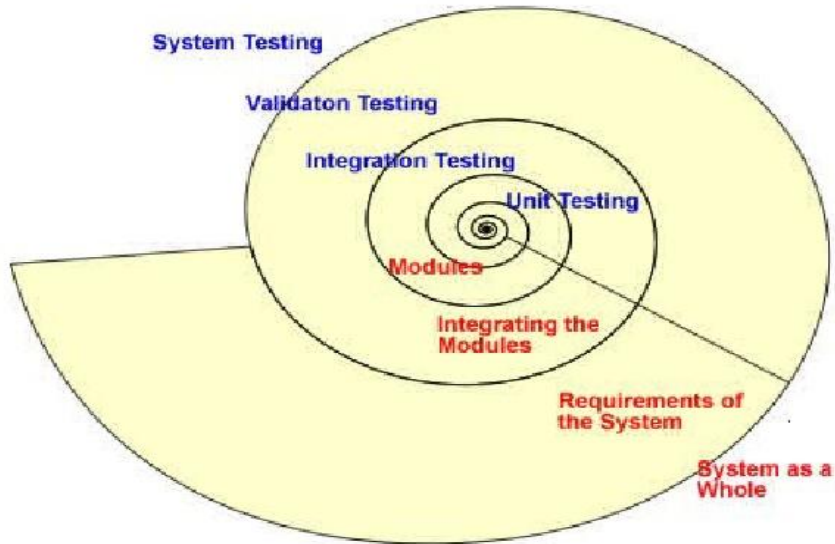


Fig. 8.6 Types of testing

8.6.1 Unit Testing:

Unit testing is the testing of an individual unit or group of related units. It falls under the class of white box testing. It is often done by the programmer to test that the unit he/she has implemented is producing expected output against given input.

8.6.2 Integration Testing:

Integration testing is testing in which a group of components are combined to produce output. Also, the interaction between software and hardware is tested in integration testing if software and hardware components have any relation. It may fall under both white box testing and black box testing.

There are two types of integration testing

- Top-down integration testing: is testing that takes place from top to the bottom of the system.
- Bottom- up integration testing: is a testing that takes place from bottom the control flow upwards.

8.6.3 System Testing:

System testing is the testing to ensure that by putting the software in different environments (e.g., Operating Systems) it still works. System testing is done with full system implementation and environment. It falls under the class of black box testing.

8.6.4 Acceptance Testing:

Acceptance testing is often done by the customer to ensure that the delivered product meets the requirements and works as the customer expected. It falls under the class of black box testing.

8.7 Implementation

The implementation is the stage where the theoretical design is turned into a working system. The most crucial stage in achieving a new successful system and in giving confidence on the new system for the users that it will work efficiently and effectively and examine in details the analysis and design of the online ordering and inventory system of supermarket. The present chapter discusses the implementation of the system, highlighting the testing exercise and describing some of the main components of the system's Graphical User Interface. It will give an output from programming language and other tools used to develop our system.

Screen shots

8.8 Login form

A Login form is used to enter authentication credentials to access a restricted page or form. This login form contains a field for the username and another for the password. When the login form is submitted its underlying code checks that the credentials are authentic, giving the user can access the restricted page. If a user is not able to provide authentic credentials they will not be able to proceed past the login form.



The image shows a web browser window titled "Login". The main content area contains a large, 3D-rendered word "LOGIN" in blue. The letter "O" is replaced by a blue globe showing the Americas. Below the text is a silver computer mouse with a cord. At the bottom of the window, there are two input fields. The first is labeled "User Name" and the second is labeled "Password". To the right of the "User Name" field is a button labeled "Login...". To the right of the "Password" field is a button labeled "Cancel".

Fig. 8.8 Login form

8.9 Home page

The home page is the first page which shows what our system does.

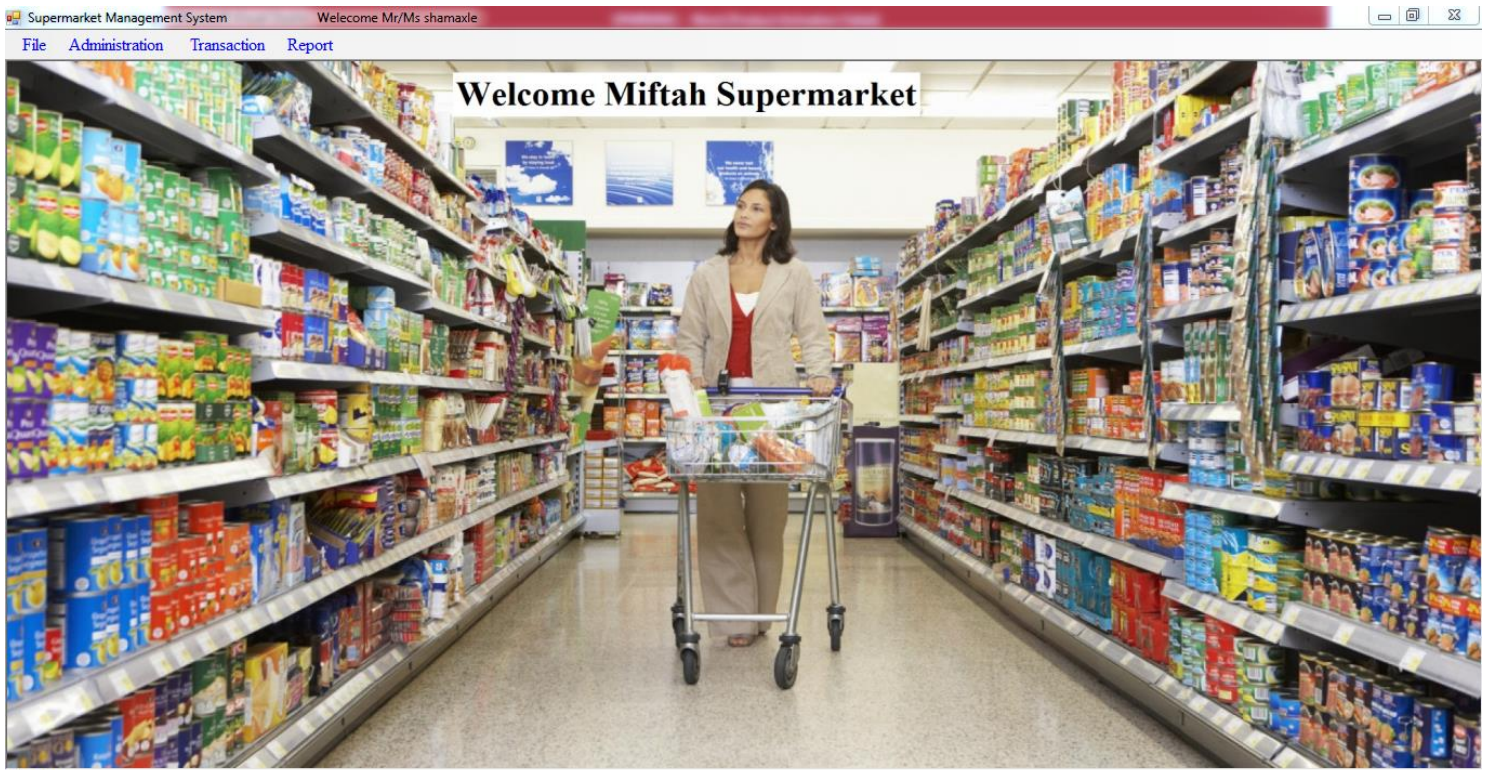


Fig. 8.9 Main page

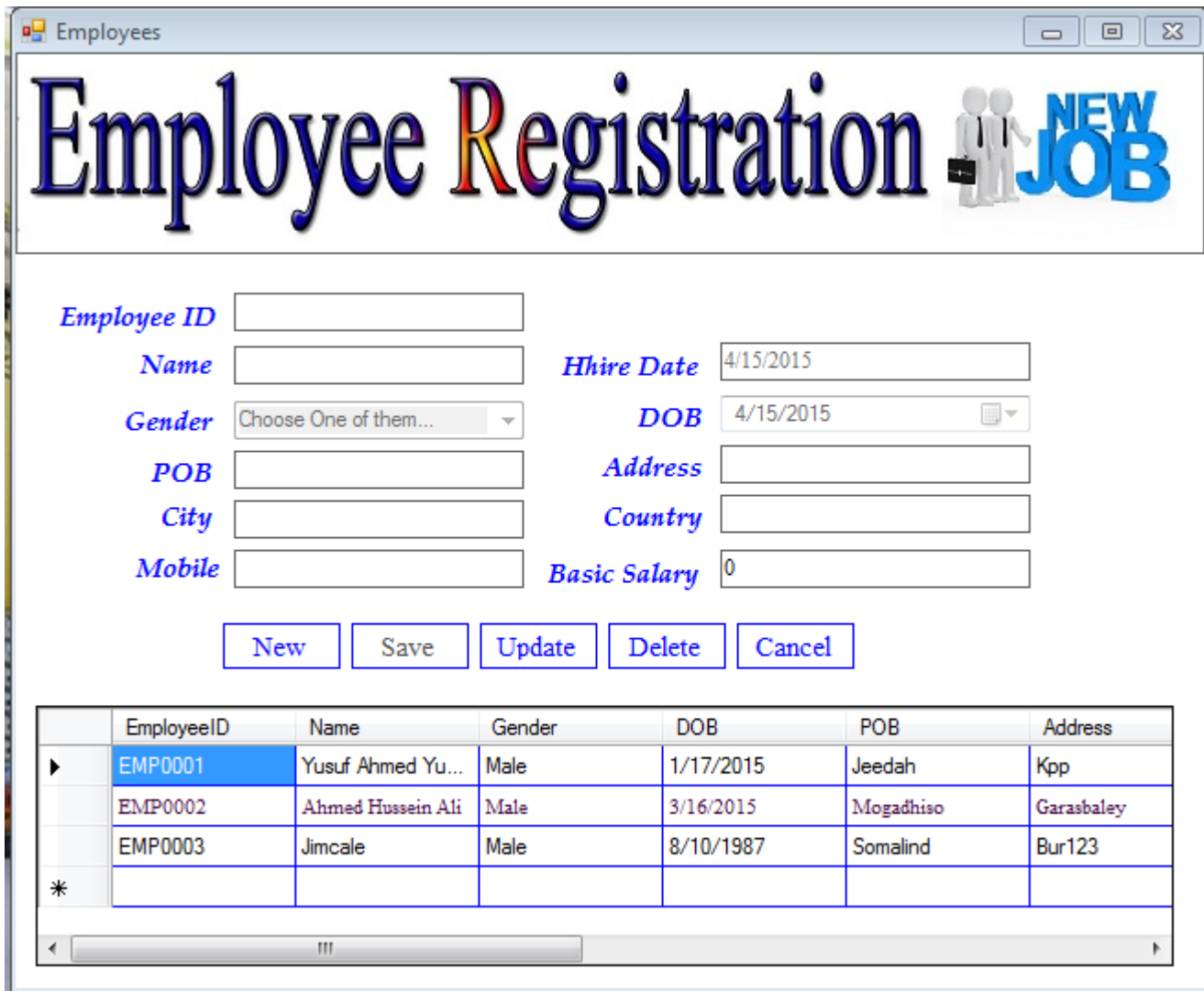
8.10 Customer Registration Form: Is where customers are registered and keep their data.


CustomerID	Name	Gender	Address	City	Cour
CUS0003	Ahmed	kpp	Mog	Som	1546
CUS0002	Abdiasis Ahmed	Male	Mogadisho	Somalia	4545
CUS0004	Abdikarim	Bur	Burco	Somalia	4333

Fig. 8.10 Customer registration form

8.11 Employee Registration

Employee Registration Form is form used to register the employee of the supermarket to their information.



Employee Registration 

Employee ID

Name *Hhire Date*

Gender *DOB*

POB *Address*

City *Country*

Mobile *Basic Salary*

	EmployeeID	Name	Gender	DOB	POB	Address
▶	EMP0001	Yusuf Ahmed Yu...	Male	1/17/2015	Jeedah	Kpp
	EMP0002	Ahmed Hussein Ali	Male	3/16/2015	Mogadhiso	Garasbaley
	EMP0003	Jimcale	Male	8/10/1987	Somalind	Bur123
*						

Fig. 8.11 Employee registration form

8.12 Supplier Registration Form



The screenshot shows a window titled 'Suppliers' with a 'Supplier Registration' form. The form includes input fields for Supplier ID, Company Name, Address, City, Country, Phone, and Date. Below the form are buttons for 'New', 'Save', 'Update', 'Delete', and 'Cancel'. A table below the buttons displays a list of suppliers with columns for SupplierID, CompanyName, Address, City, Country, and Phone. The first two rows are highlighted in blue. A third row is marked with an asterisk, indicating a new entry.

	SupplierID	CompanyName	Address	City	Country	Phone
▶	SUP0001	Oracle	Ohia	Washinton	USA	0016
	SUP00002	Microsoft	newyork 12	Newyork	USA	0044
*						

Fig. 8.12 Supplier registration form

8.13 Items Form

This form items are registered when it is imported into the supermarket. You will put item id or serial number, name, quantity, price, shelf number or where is available and cost it was bought and time imported into the supermarket.

ItemID	ShelfNO	Name	ItemType	Quantity
1	1	Asparagus	Fresh vegetables	99
2	2	Broccoli	Fresh vegetables	99
3	3	Carrots	Fresh vegetables	100
4	4	Cauliflower	Fresh vegetables	100
5	5	Celery	Fresh vegetables	100

Fig. 8.13 Items registration form

8.14 User Form

Create User

User ID:
 Employee ID:
 User Name:
 Password:
 Confirm New Password:
 User Type:
 Date:

Privilege

Create User Change Password Customers
 Damage Employees Items
 Order Sales Order Detail
 Payment Suppliers Receipt
 Report Sales Return

	UserID	EmployeeID	UserName	Password	UserType	Status	
▶	U0003	EMP0001	shamaxle	123456	Admin	UNBLOCK	1
	U0004	EMP0002	ali	123	User	UNBLOCK	4
*							

Fig. 8.14 User registration form

8.15 Transaction Part

Sales Form: form which is registered the daily sales or transaction on the supermarket.

Customer Information

Invoice NO User Name Date

Customer ID Cust-Name

Item Information

Item ID Item Name Item Type

I / on Hand Quantity Price Amount

Payment

Total Discount Amount Paid Balance

	InvoiceID	CustomerID	Name	UserName	NO	Item
▶	TRN0004	Select...		yusuf	1	8
	TRN0004	Select...		yusuf	2	9
	TRN0004	Select...		yusuf	3	10
	TRN0004	Select...		yusuf	4	11

Fig. 8.15 Sales form

6.16 Order Form

Order ID User Name Date 4/15/2015

Supplier ID Item ID

Item Name Item Type Quantity

	OrderID	NO	SupplierID	UserName	ItemID
▶	OR0001	1	SUP0001	yusuf	Beef
	OR0002	1	SUP0001	yusuf	Cad
*					

Fig. 6.16 Order form

6.17 Order Detail Form

Order_Details

Order Details

InvoiceNO User Name Date 4/15/2015

Supplier ID Item ID

Item Name Item Type Quantity

Cost Price

	InvoiceNO	NO	UserName	SupplierID	ItemID
▶	INV0001	Yusuf	1	SUP00002	1
*					

Fig. 6.17 Order detail form

6.18 Damage Form: form which is registered items which are damaged

DamageID	ItemID	Name	Item Type
D0003	ITM0001	Milk	Beef
D0002	ITM0001	Boosatoore	UH
D0004	ITM0001	Milk	Beef
D0005	2	Broccoli	Fresh vegetables

Fig. 6.18 Item's damage form

6.19 Sales Return Form: form which is registered the items which customer's bought and then back to the supermarket.

InvoiceID	UserName	CustomerID	ItemID
TRN0001	yusuf	CUS0003	1
TRN0002	yusuf	CUS0002	25
TRN0003	yusuf	CUS0002	9
TRN0004	yusuf	Select	11

Fig. 6.19 Sales return form

6.20 Payment Form

The screenshot shows a window titled 'Payments' with a header image of two hands shaking. The main title 'Payment' is displayed in large blue font. Below the header, there are input fields for 'User Name' and 'Date' (4/15/2015). Further down, there are fields for 'Payment ID', 'Supplier ID' (a dropdown menu), 'Balance' (0), and 'Amount Paid'. A row of buttons includes 'New', 'Save', 'Update', 'Delete', and 'Cancel'. At the bottom, a table displays a list of payment records.

PaymentID	SupplierID	UserName	Balance
P0004	SUPP0001	EMP0002	10.0000
P0005	SUPP0002	EMP0003	10
P0006	SUPP0001	EMP0001	25
P0007	SUPP0001	Select On of the...	20
P0008	SUPP0002	EMP0004	90

Fig. 6.20 Payment form

6.21 Receipt Form

Receipt Form

User Name Date

Receipt ID

Customer ID Name

Balance Amount Paid

ReceiptID	CustomerID	UserName	Balance
R0007	CUST001	EMP0001	10
R0008	CUST001	Select One...	10
R0009	CUST001	Select One...	25

Fig. 6.21 Receipt form

CHAPTER NINE

CONCLUSION AND FUTURE WORK

9.1 Conclusion

The Internet has become a major resource in modern business, thus electronic supermarket has gained significance not only from the entrepreneur's but also from the customer's point of view. For the entrepreneur, electronic supermarket generates new business opportunities and for the customer, it makes comparative shopping possible. As per a survey, most consumers of electronic stores are impulsive and usually make a decision to stay on a site within the first few seconds. "Website design is like a shop interior. If the shop looks poor or like hundreds of other shops the customer is most likely to skip to the other site". Hence we have designed the project to provide the user with easy navigation, retrieval of data and necessary feedback as much as possible.

This project helps in understanding the creation of an interactive web page and the technologies used to implement it. The design of the project which includes Data

Model and Process Model illustrates how the database is built with different tables, how the data is accessed and processed from the tables. The building of the project has given me a precise knowledge about how ASP.NET is used to develop a website, how it connects to the database to access the data and how the data and web pages are modified to provide the user with a shopping cart application.

"**Supermarket Administration and Management System**" software developed for a company has been designed to reduce the time taken to handle the sales activity. It is designed to replace an existing manual record system for reducing time taken for calculations and for storing data. The system uses Visual Basic as front end and SQL server as a backend for the database.

The system is strong to handle daily operations where the database is cleared over certain time. This system will reduce manual work, calculations and will also provide periodic reports any time.

9.2 Future work

This system is desktop management and administration system in a future we will upgrade, develop and change this system in an online system with a finger print which people can access through internet. People will purchase items and make order staying their home not taking any step to the supermarket.

REFERENCES

- [1] <http://www.bestprojectsidea.com/vb-6-0-synopsis/supermarket-management-system/> [Last accesses: Dec20, 2014].
- [2] <http://www.scribd.com/doc/27828662/ABSTRACT-the-Project-supermarket-Deals-With-The> [Last accesses: Jan 15, 2015].
- [3] <http://www.memoireonline.com/07/12/5995/Online-ordering-and-inventory-system.html> [Last accesses: Jan 16, 2015].
- [4] <http://www.scribd.com/doc/37762263/Online-Supermarket-System> [Last accesses: Jan 16, 2015].
- [5] <http://pdfbooklibrary.com/pdf/all-uml-diagrams-for-supermarket-management-system.pdf>. [Last accesses: Jan 16, 2015].
- [6] http://www.webopedia.com/TERM/E/entity_relationship_diagram.html [Last accesses: Jan18, 2015].
- [7] <https://www.scribd.com/doc/88753639/8/Data-Dictionary> [Last accesses: Jan 25, 2015].
- [8] http://faculty.mu.edu.sa/public/uploads/1414260422.4274vb2008book_ed2.pdf [Last accesses: Feb 05, 2015].
- [9] <http://www.ijeee.net/uploadfile/2013/0702/20130702101737944.pdf> [Last accesses: Feb 10, 2015].
- [10] <http://www.scribd.com/doc/140997151/Supermarket-Management-System-Project-Report#scribd> [Last accesses: Feb12, 2015].
- [11] <http://www.slideshare.net/rajeshroky1/the-main-purpose-of-the-project-is-to-manage-the-supermarket-efficiently-repaired2-1> [Last accesses: Mar 02, 2015].
- [12] <http://www.scribd.com/doc/135087179/Online-Shopping-System-Project-Report#scribd>. [Last accesses: Mar 10, 2015].
- [13] <http://www.slideshare.net/gajapandiyan/online-shopping-16603063> [Last accesses: Mar 10, 2015].
- [14] http://library.ndsu.edu/tools/dspace/load/?file=/repository/bitstream/handle/10365/23054/Swati_Online%20Shopping%20Cart%20Application.pdf?sequence=1 [Last accesses: Mar 15, 2015].
- [15] <http://www.scribd.com/doc/135087179/Online-Shopping-System-Project-Report#scribd>. [Last accesses: Mar15, 2015].
- [16] <http://edutwin.com/s/literature-review-for-supermarket-billing-system-in-vb> [Last accesses: Mar18, 2015].
- [17] http://www.academia.edu/10159567/DESIGN_AND_IMPLEMENTATION_OF_SUPERMARKET_MANAGEMENT_SYSTEM [Last accesses: Mar 20, 2015].

[18] <https://www.scribd.com/doc/51580564/2/OBJECTIVE-OF-ONLINE-SHOPPING> [Last accesses: Mar 21, 2015].

[19] S. Qin, "Supermarket chain management system WAN design patterns," Applications of Computer Systems, vol. 7, pp. 7-8, July 1999. [Last accesses: Mar 22, 2015].

[20] <http://www.ijsr.net/archive/v2i9/MTIwMTMzNg==.pdf> [Last accesses: Mar 22, 2015].