WEB BASED VCD/DVD ORDERING SYSTEM – A PROTOTYPE

A project submitted to the Graduate School in partial fulfillment of the requirements for the degree Master of Science (Information Technology), Universiti Utara Malaysia

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ABSTRACT

Web based ordering have become an interesting e-commerce technique within the brick-and-mortar stores. Therefore, this project mainly aims to develop a start up version of a Web Based VCD/DVD Ordering System for a case organization namely Golden Star VCD Store that on the whole sells the VCD/DVD movie products. However, as the time and budget constraint, the project focused on build up a prototype Web Based VCD/DVD Ordering System for the store. As the Lntemet accessibility has shown a growing numbers in Malaysian home, therefore this project hope to provide an alternative way of gaining competitive advantages for Golden Star VCD Store throughout the country despite enable the customers to experience a new way of purchasing the VCD/DVD. The methodology used for this project is derived from Rational Unified Process (RUP) that has been customized by applying Unified Modeling Language (UML) technique to analyze and design the prototype system. As a result, this prototype is the start up version for Web Based VCD/DVD Ordering System provides customers the ability to view the products and check for the products availability with the facility to preview the movie trailer on the web, specify the account information, add the preference products to the shopping cart or order list, and finally login for check out to place the order. This study is significance to provide a reference model for the brick-and-mortar store to start up the web based ordering application using MySQL and PHP open source. Thus, this study provides an alternative way for the customers to purchase the products through the web based application in spite of the brick-and-mortar stores with more convenience service. This report presents the evaluation of the prototype system based on usability testing to evaluate users' satisfaction and concludes with the recommendations for enhancement of the prototype and future research of the system.

ABSTRAK

Tempahan berasaskan web menjadi teknik perniagaan berelektronik yang semakin ditetima baik oleh masyarakat yang mengamalkan corak pemiagaan konvensional berasaskan kedai. Justeru itu, projek ini bertujuan untuk membangunkan satu versi permulaan untuk Sistem Tempahan VCD/DVD Berasaskan Web bagi sebuah kedai menjual produk filem VCD/DVD yang bernama "Golden Star VCD Store". Walau bagaimanapun, dengan kekangan masa dan kewangan, maka projek ini memberikan penekanan khusus kepada pembangunan sebuah model percubaan Sistem Tempahan VCD/DVD Berasaskan Web. Dengan peningkatan penggunaan Internet di kalangan rumah di Malaysia, maka projek ini berharap untuk menawarkan satu jalan pilihan untuk mencapai kelebihan persaingan bagi "Golden Star VCD Store" dengan menawarkan cara baru untuk pelanggan membeli VCD/DVD. Projek ini menggunakan kaedah *Rational Unified Process (RUP)* yang telah diubahsuai dengan mengaplikasikan teknik *Unified Modeling Language (UML)* untuk menganalisis dan merekabentuk model percubaan ini. Kesimpulannya, model percubaan bagi versi permulaan untuk Sistem Tempahan VCD/DVD Berasaskan Web menawarkan pelanggan untuk melihat dan menyemak keadaan produk dengan kemudahan untuk menonton filem pra-tayangan menerusi web, mengadakan akaun, menambah produk dalam senarai tempahan dan berakhir dengan menghantar tempahan. Kajian ini penting sebagai model rujukan bagi kedai konvensional untuk memulakan pemiagaan tempahan berasaskan web dengan menggunakan sumber terbuka MySQL dan PHP. Dengan demikian, kajian ini menawarkan jalan pilihan kepada pelanggan untuk membeli produk melalui web salain daripada kedai yang sedia ada dengan servis yang lebih senang. Laporan ini juga mempersembahkan penilaian terhadap model percubaan berdasarkan *Usability Testing* untuk menilai kepuasan pelanggan dan menyimpul dengan cadangan untuk memperbaiki model percubaan ini dan perkembangan masa depan bagi sistem yang dibincangkan ini.

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CHAPTER ONE

INTRODUCTION

Nowadays, VCD/DVD based products have gone through the brick-and-mortar stores business where the buying activities are manually process. Upon in the stores, customers have to looks through the products displayed on the racks, picks their preference products before checked out at the counter for payment purpose. Those ordinary brick-and-mortar stores sales imply the consuming time for the customers in making traditional transaction. Therefore, this project specifically aims to introduce a prototype of the start up model for Web Based VCD/DVD Ordering System as an alternative for customers in purchasing VCD/DVD.

This chapter gives an overview of the organization and its requirement and also outlines the problem statements, project's objective, scope of the study, and significance of the study. The outline for the organization of this report is also being discussed in this chapter.

1.1 An overview of the organization

Golden Star is a VCD/DVD store that mainly sells the VCD/DVD movie products. It is located at Jalan Nenas, 41400 Klang, Selangor. It has been established since year 1998 and sells an average of 2000 VCD/DVD per month which is operates by five employees. Currently, this store concentrates their business to the walk-in customers and all the business transactions are manually been done. Most of the visiting customers come from the nearby residential areas. Hence, the business scope is quite limited. Therefore, it is inefficient and inconvenience to be practiced in the technology world today.

1.2 The organization requirement

The Golden Star VCD Store needs a strategy that differentiates from the existing brick-and-mortar business to gain the competitive advantage in the market. Consequently, this store requires a web based system to provide an alternative for the customers to purchase the VCD/DVD movie products, despite as a marketing tool to expand the business throughout the country, promote its wide range products on the computer screen and increase sales through web based ordering.

1.3 Problem statements

Recently, consumers around the world are increasingly turning to their computers through the Internet to buy wide array of goods and services (Federal Trade Commission, 2000). Federal Trade Commission Department of Commerce (2000) stated that web based ordering system provides an alternative way to do the business that has created enormous benefits and efficiencies. For consumers, web based ordering offers 24 hours access; for the company, it expands sales market share to the global (Rabiah *et. al.*, 2002). Thus, traditional shops are strongly suggested to participate in electronic commerce (e-commerce) to increase sales and provide an advertising tool through the Internet to reach potential customers around the world.

Based on the survey carried out in the case organization, Golden Star VCD Store, the existing business has facing the problem of limited scope of sales due to the great competition in the market. This competition brings the customers go to the business that able to provide them with the better services. The reason is that a click of a mouse is the fastest way ever for customers to change providers (Percival-Straunik, 2001). Thus, inefficiency of customers' services will influence the brick-and-mortar business.

Consequently, the customers were facing insufficient customer services provide by the store. Sometimes, the customers may face the problem where

the products being search by them are out of stock or not available in that particular time. Besides that, customers are also having time limitation to purchase in brick-and-mortar store due to its business hour. Therefore, the development of Web Based VCD/DVD Ordering System mainly aims to provide a solution due to these matters.

1.4 Project's objective

The objective of this project is to build a prototype of the Web Based VCD/DVD Ordering System to produce a start up version for the existing brick-and-mortar business based on the case organization. This system aims to provide an alternative way to the customers to order the products through web based application with the services that available for anytime and anywhere. Consequently, the brick-and-mortar businesses will able to expand their market globally and gain the competitive advantage through the implementation of web based ordering.

In order to achieve this objective, a research question that needs to be considered as following:

What are the main functions that should be include for a start up version of the Web Based VCD/DVD Ordering System?

1.5 Scope of the study

The scope of this start up version for the prototype Web Based VCD/DVD Ordering System covers the main functions of the web based ordering which provides the basic ability for customers to order their preference products through web based system. These functions include the ability for the customers to view the products with facility to preview the movie trailer and check the products availability, specify the account information, add to a shopping cart and check out to place the order. However, this system excluded the actual credit card processing.

1.6 Significance of the study

This study is essential to give an idea for the brick-and-mortar store to achieve the organization requirement and fulfil the customers' requirements. It is significance to provide a reference model for the brick-and-mortar store to start up the web based ordering system for the current outlet's business. Through the implementation of the web based ordering, the brick-and-mortar store would be able to compete in the existing market, globally expand the market, promotes the products throughout the country, whereby provides an alternative way of doing business that aims to increase the sales and gain the competitive advantages.

At the same time, this study contributes an example of a simple but satisfied prototype system with low development cost by using MySQL and PHP Open Source to start up the web based system.

As for the customers' point of view, web based ordering would provides them an alternative to purchase the VCD/DVD. Moreover, the customers would gain more convenient services with the online facilities such as to browse the preference VCD/DVD products regardless of time and geographical boundaries, despite the abilities to check the products availability, preview movie trailer on the web before making any order for the preferable products through web based system.

1.7 Organization of the report

Chapter 1 – Introduction

This chapter gives an overview of the organization, the organization requirement, problem statements, project's objective, scope of the study, significance of the study, and organization of this report.

Chapter 2 – Literature Review

This chapter reviews on the advantages of using the web based system in helping the brick-and-mortar business. The web based systems relating the

ordering that available on the web is being reviewed in order to get the main functions for start up the web based ordering to the existing brick-and-mortar business.

Chapter 3 – Methodology

This chapter explains the Rational Unified Process (RUP) methodology that has been customized to best suit to the project needs by applying Unified Modeling Language (UML) technique to analyze and design the prototype system.

Chapter 4 – Inception Phase

This chapter discusses on business case for building the prototype system and defined the project scope to set limitation of the prototype system.

Chapter 5 – Elaboration Phase

This chapter describes on detailed analysis of the problem domain and the definition of an architectural foundation for the project.

Chapter 6 – Construction Phase

This chapter describes the transformation of the system architecture into codes using the selected software tools.

Chapter 7 – Evaluation

This chapter discusses the evaluation of the prototype system based on usability testing to ensure the system is satisfied to the target audience and provides the result analysis.

Chapter 8 – Conclusion

This chapter reviews the overall progress of this project. It includes problems and limitations encountered during the development of this project, recommendations for enhancement to the current prototype system and recommendations for future research.

1.8 Summary

This chapter gives an overview to the project, which is to develop a prototype of the start up version for Web based VCD/DVD Ordering System that based on the case organization, namely Golden Star VCD Store. However, for the start up stage, it is developed to meet the organization requirement to produce an alternative way for the customers to purchase the VCD/DVD with more convenient process that can check the products availability and preview movie trailer on the web. The following chapter will reviews on the related researchs regarding web based ordering system.

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the advantages of using the web based system in helping the brick-and-mortar businesses. The system that related with web based ordering, which is available on the web is being reviewed in order to get the main functions for the start up of the web based ordering system that can be applied in the existing brick-and-mortar businesses.

2.1 Ordering concept

Concept of "ordering" in the brick-and-mortar stores that described here is "purchasing" or "buying".

2.1.1 What is ordering

The verb "order", according to Wordreference.com (2003), means to request (something) to be supplied or made, especially in return for payment. More generally, "order" refers to a request to purchase products or services. Thus, ordering bring the meaning of requesting to supply products.

2.1.2 Purchasing in brick-and-mortar

For a brick-and-mortar store, the products are displayed on the racks. A customer visit the store, looks through the products displayed on the racks, finds the products they are interest in and puts the products in the shopping basket. After the customers have finished

selecting products and ready to purchase, they can proceed to the checkout counter and pays for their purchased products by credit card or cash.

2.1.3 Brick-and-mortar limitations

Most of the VCD/DVD stores are categories in brick-and-mortar business. Based on the earlier survey carried out on the case organization, Golden Star VCD Store, the following problems have been identified.

- In Klang town, a high numbers of competitors existing in the small market that makes a market share becoming smaller and more competitive.
- The brick-and-mortar store market has limited target of sales. Most of the customers come from the nearby residential areas whereby regular customer is the key buyer.
- There is limitation of operation hours in brick-and-mortar businesses whereby the online businesses are operating in 24 hours.

In term of customer's perceptions, there are some limitations exist in doing transactions process at brick-and-mortar store, such as following:

- The customers have to go personally into the store and spend their effort to look and search for their preference VCD/DVD products. In the searching process, time consuming is one of the great lost.
- Most of the time, customers fail to buy their preference VCD/DVD products whereby the products are not available at that particular time or out of stock.
- Sometimes, the customers face an inconvenience time to purchase the VCD/DVD products whereby the store is closed.

2.2 An overview of web based ordering

With the rapid grown of the Internet today, the traditional way of system ordering may not be effective and efficient to handle the sales order. In this century, the Internet has brought along with a new wave for shopping system, known as e-commerce that characterized various businesses process in buying and selling of goods or services on the web (Hilary, 2000). The idea of e-commerce as an alternative to brick-and-mortar businesses seem to support by Brain (2003) who stated that in general, the more convenience and less time-consuming of the purchase order can be proceed, which more likely consumers preferred the Internet rather than standard physical means of doing transactions.

As technology change rapidly, thus many businesses strive to establish their presence in the Internet based e-commerce environment as a feedback to new market structure. With this scenario in mind, VCD/DVD stores have to build up its potential market coverage by moving into the web based businesses, which are coming more imperative than the traditional brick-and-mortar stores. The start up version of VCD/DVD web based ordering system is able to ensure the Golden Star VCD Store to retain the competitive advantage for its niche market throughout the country and worldwide.

2.2.1 What is web based ordering

According to Keen and Balance (1997), the web defined as a subset of the net that uses what is called hypertext (web addresses routinely begin with "http" for hypertext transfer protocol) to connect information items – web pages – to each other. Thus, the web provided an entirely new way of interacting with information online.

Web based ordering system is one type of the e-commerce system that categorized in business-to-consumer (B2C) e-commerce. B2C e-commerce attempts to offer new, web based channels of distribution for traditional products and services from businesses to consumers

and the typical consumer can research, order and pay for products directly via the Internet (Whitten, 2001). In order to justify the term, Haig (2001) defined a web based ordering system as an online order processing engine where customer could placed order for preferred products or services via the store's web site. In the more common language, web based ordering is the process of purchasing products on the web.

2.2.2 Why web based ordering

Nowadays, the web based ordering system is not being widely implemented by brick-and-mortar VCD/DVD stores in Malaysia even though the VCD/DVD products acquired have been highly demanded by the customers. Thus, the industry can be described as faced high competitive in the current home entertainment market. Therefore, the existing VCD/DVD stores need to build its own web based system to compete with others competitors in the existing market. By the way, web based ordering system can provide a new alternative way for their customer to purchase the VCD/DVD products with more faster and efficiency way. As a result, the business always prefer to the customer requirements in preferring the better and faster services in the transactions process. This study contends that the usage of a web based database model for business organization such as brick-and-mortar VCD/DVD stores would help in providing relevant solutions and increasing customers' satisfaction.

According to Emarketer.com's March 2001 B2C report, consumer e-commerce sales in the U.S. estimated growth from $60 billion in 2000 to $428 billion by 2004 (Bentrum, 2002). This figure shows that the enormous growth of the Internet over the pass few years has attributed to consumers' enthusiasm for buying products and services online. Importantly, the ability to increase purchases and reduce costs arises from this system expecting to help the traditional VCD/DVD store to increase the profit in today highly competition world.

By the way, Brain (2003) commented that an e-commerce site might help the conventional stores to decrease complexity and increase flexibility and simplicity, which then give an advantage to the stores to differentiate its marketing strategy from the other. For instances, Hilary (2000) predicted that by 2004, e-commerce would emerged to generate more than a trillion dollars in sales for the developing countries.

Nevertheless, the proposed web based ordering system would be able to bring huge profit to the VCD/DVD stores as Malaysian home increasingly accessible to the Internet. Brain (2003) emphasized that home as the most popular access location with nearly 70% of users accessing from their homes, and almost 60% shop online and this give a great business opportunity when integration of the traditional shop and the web based ordering system work together throughout the world. Thus, web based ordering system is an enhancement business way to improve the existing sales of VCD/DVD stores in Malaysia. For primarily brick-and-mortar stores, web channel can be implemented in order to strengthen existing operations to serve customers (about.com, 2003). Therefore, a huge business market is waiting brick-and-mortar stores to share the profit through online facilities.

In proposing the project, there are three benefits have been identified from the web based VCD/DVD ordering system, which are: 1) geographic and product market extension, 2) provides larger catalogs, and 3) improves customer satisfaction. An elaboration on these potential benefits from physical and virtual integration is as following:

- *Geographic and product market extension*

Adding a virtual channel can help extend the reach of a conventional VCD/DVD store beyond its traditional physical store by addressing new geographic markets, new products markets and attracting new customers. Virtual channels such as web based VCD/DVD stores

would gain its competitive advantage when extended its product scope and product depth through offered products, which are unable to provide in the local physical stores. Finally, the proposed Web Based VCD/DVD Ordering System could help reach the customers within an existing market who may not have visited the physical store but are attracted to the virtual channel due to its special characteristics (Steinfield *et. al.*, 2002).

- *Provided larger catalogs*

Web based system has the ability to advertise large catalogs through web site at low cost and the entire customers could search easily for their needed products (Brain, 2003). Compared to the brick-and-mortar store, it is always has limited space to display all the products.

- *Improved customer satisfaction*

Nowadays, customers are more demanding. Therefore, Keen and Balance (1997) provided an insight that the web based system has opens up additional channel through which to market and sell products and services. While Brain (2003) discussion has derived a happy customer was those who likely to experience new or innovative way of doing transactions. In the more common language, the customers want the convenient, hassle-free shopping environment and the site that is easy to use (Percival-Straunik, 2001). Hence, the proposed system put forward few advantages that attract the attention of the customers. The advantages include the following:

1. Increase speed and accuracy of information.
2. A wider range of product choices is available.
3. A peripheral entertainment such as movie trailer is able to display via the Internet.
4. Shop from home which reduces transportation cost and traffic jams (Hilary, 2000).
5. Order can be done anytime (Abbey Office Supplies Ltd., 2003).

6. Place, amend and view the order on screen (Abbey Office Supplies Ltd., 2003).

However, the changing of commercial environment parallel with the emergent shopping possibilities mean Malaysian should have the choices of operating in two discrete roles that as real world consumers and as virtual consumers. Lindstrom (2001) research shown that the modern young consumers would likely to stick with the brick-and-mortar store longer than the virtual online shopping, but once those consumers find the online ordering system suits them, they were keen to shift their patronage online and loyal to the click-and-mortar retailers. Thus, other retailers who do not have this facility are difficult to win back.

Furthermore, Rose *et. al.* (1999) pinpointed that the web based business does not cost much to start, even the smaller organization such as Golden Star VCD Store can afford to market its wares to hundreds of millions of potential e-consumers throughout the country.

Like most companies, Golden Star VCD Store wishes to develop a web based channel to compete in the global market and offers their wide range products or services to customers. Therefore, the web based ordering system is suit to meet the organization's requirement which enables the customer to order their preference product through online and the ordered products will be delivered to the customers shortly after their respective payment has been approved or the payment has been made. Nevertheless, this is an easier way to reduce time consuming and help to reach more potential customers by a small investment.

2.2.3 Eastern Records Sdn. Bhd. (http://eastern.com.my)

The example of using the web based ordering system in Malaysia home entertainment industry can be observed from the Eastern

Records Sdn. Bhd. based on the company's web site available at http://eastern.com.my shows that it was a good opportunity to develop a prototype web based ordering for entertainment products such as VCD/DVD movie.

Eastern Records Sdn. Bhd. has been in home entertainment industry of supplying high volume of CDs, VCDs, DVDs and music accessories on wholesale basis to music retailers in Malaysia and other continents as well, since 1972.

Eastern Records is exploring further into development in order to make sure of the highest satisfaction is delivered to their clients. As a result, Eastern Records had equipped with highly sophisticated computer system and databases. Today, Eastern Records ready to be customer "Internet Store" of choice, especially for their valued dealers. In such a way, with the highly efficient and reliable system, now customer manage to obtain latest news, newly released products and even place the order online through Eastern Records web site with simple steps for the ordering process as following:

Step 1: Select title

In the products' page, the customers are free to select any of their desire item(s) and add into their shopping cart or "order form". After the button "Add to cart" is clicked, customers will prompt to a new page to view their shopping list.

Step 2: Quantity

In the shopping list, customers are able to select the quantity of each item, which has been selected earlier.

Step 3: Auto-calculate

If the customers have selected more than one item or quantity is more than one, they can click "Calculate" to calculate the total amount incur for their shopping items. After that, if customers wish to continue

shopping, they can click on the button "Continue shopping" below the shopping list and therefore, it brings them back to the products' page where they come from. Otherwise, the customers can click "Check out" to end their shopping.

Step 4: Order list and customers particulars
After check out, the customers will prompt to a preview page that enables them to view the summarized shopping list. Here the customers are requested to fill in their personal particulars, delivery address, shipping method and payment method. Then, click "Done" to send the order.

Step 5: Re-confirm
Eastern.com.my will send the customers a confirmation email to notify the status of the order together with an order ID. With this order ID, customers can track for their order and delivery status.

In the summary, a good web based ordering system should have the main steps as suggested above.

2.2.4 What should have in a web based ordering

Bentrum (2002) advised that do not try to offer too many features for the first release because there are many software projects never make it due to an over-ambitious set of requirements. Consequently, based on the Eastern Records web based ordering process, the start up version of Web Based VCD/DVD Ordering System should include the main functions for web based ordering: browse the products, specify the account information, add to shopping cart and check out to place order.

At a minimum, a web based ordering system needs to display all the products to the customers. Therefore, the system needs a catalog. The

product catalog should be organized so that it is easy for the customers to find the products.

Furthermore, shopping cart should be provided to maintain the relationship between the customers and the products they want to buy. Web based customers need to be able to add items from the shopping cart, as well as view the quantity ordered as they move throughout the site.

In addition, the customers should be able to create the user profile. The information for user profile should include the personal detail, shipping detail and the payment detail. As part of the check out process, customer's information can be pre-populated into the check out form if the customer has previously registered from the site.

In order to accomplish personalization, the system needs some way to authenticate customers. That is, the system must be able to recognize and verify the customers before they are further to the check out process.

2.3 Summary

The chapter highlighted the significant of web based ordering to the brick-and-mortar business and reviewed the basic features for the start up version of a web based ordering system. Thus, the main functions to start up the Web Based VCD/DVD Ordering System for the brick-and-mortar business were gathered. The following chapter will discusses on the methodology used for this project.

CHAPTER THREE

METHODOLOGY

This chapter explains the project's methodology used in building the prototype of Web Based VCD/DVD Ordering System. This project follows the customized Rational Unified Process (RUP) methodology to best suit to the project needs by applying Unified Modeling Language (UML) technique to analyze and design the prototype system.

3.1 Methodology

A methodology consists of an approach to software development such as object-orientation, a set of techniques and notations such as the UML that support the approach, a life cycle model such as spiral incremental to structure the development process and a unifying set of procedures and philosophy (Bennett, McRobb, & Farmer, 2002). Methodology is a set of general selection and sequence of techniques capable of producing arrange of software product. The use of a methodology helps to produce a better quality product, in term of documentation standards, acceptability to the users, maintainability and consistency of software.

A system development methodology is a very formal and precise system development process that defines a set of activities, methods, best practices, deliverables and automated tools for system developers and project managers to use to develop and maintain most or all information systems and software (Whitten, 2001). Therefore, a system development methodology is based on the life cycle model of system development which consist a number of

development phases with a set of steps for each phase. It provides a framework which enables the developer to easily develop the system. Hence, this project applied the customized RUP in order to complete the prototype system.

3.2 The customized RUP

The Unified Process is a software development process, which is a set of activities to be performed in order to transform a user's requirements into a software system. The RUP is a Web-enabled browser-based tool sold by Rational Software Corporation which provides a searchable knowledge base supporting the use and implementation of the Unified Process. Its goal is to ensure the production of high-quality software that meets the needs of its end-user, within a predictable schedule and budget (Rational Software, 2000). The RUP is based on methodologies by Booch, Rumbaugh and Jacobson, tries to combine the best practices, processed and guidelines along with the UML.

The RUP divides one development cycle in four consecutive phases: inception phase, elaboration phase, construction phase and transition phase. Each phase is concluded with a milestone defining a point in time at which specified key goals must have been achieved in order to continue to the next phase. Each phase is then broken down into one or more iterations, each of which step through a series of workflows as shown in Figure 3.1.

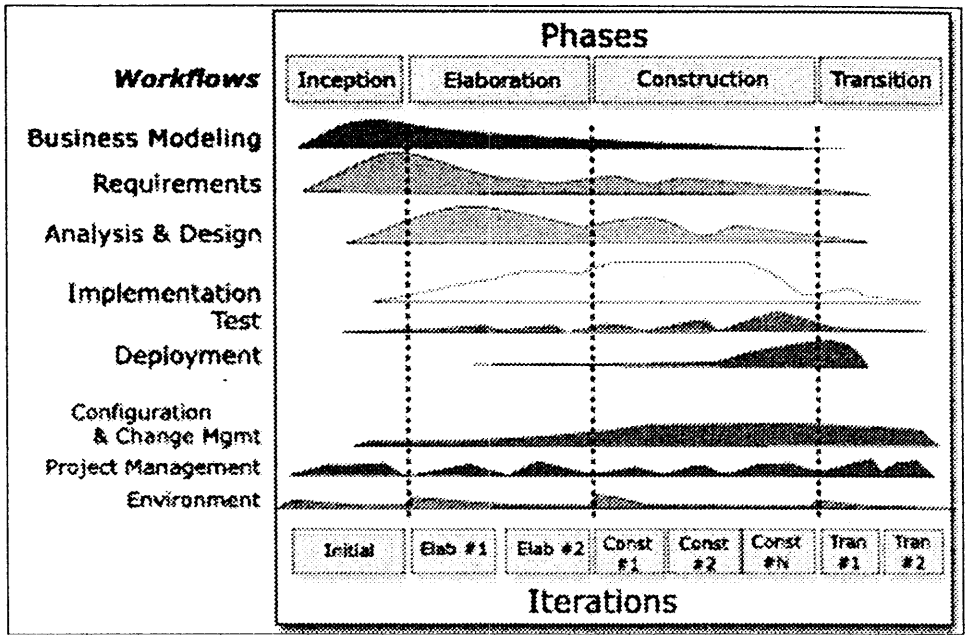

Figure 3.1: RUP phases and workflows

A workflow is a sequence of activities that produces a result of observable value. The RUP consists of nine core process workflows that can be divided into core engineering workflows and core supporting workflows. There are six core engineering workflows: business modeling, requirement, analysis and design, implementation and deployment, and also three core supporting workflows: project management, configuration and change management and environment.

3.2.1 Phases

During the development process of the prototype for the web based VCD/DVD Ordering System, the RUP was customized to suit and tailor the project development as shown in Figure 3.2. The phases involved in this prototype system development are explained as follow.

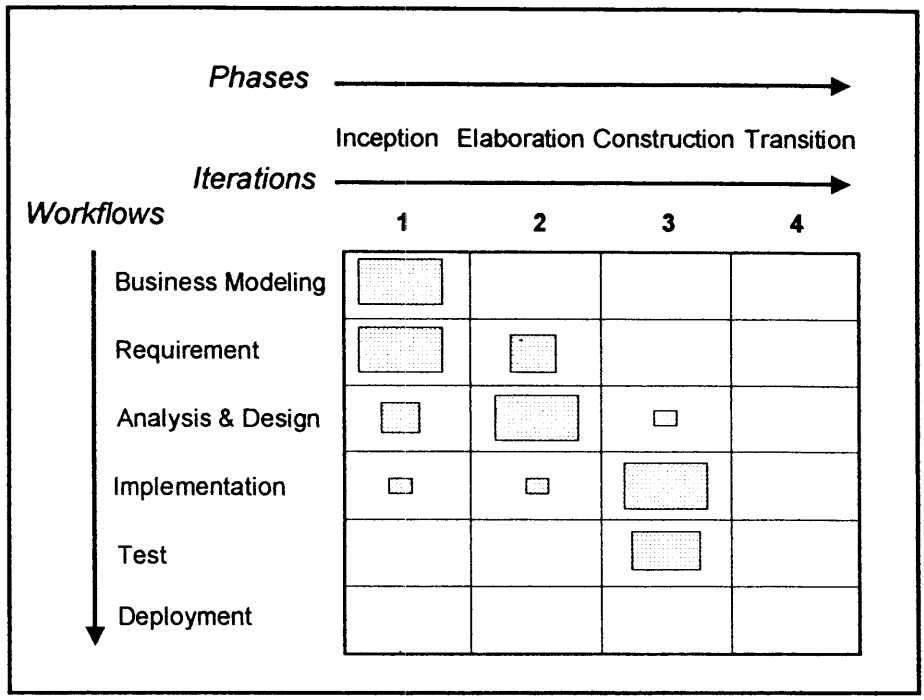

Figure 3.2: Project's methodology

- *Inception phase*

This phase focuses on business case for the prototype of the Web Based VCD/DVD Ordering System, including identifying the project's objective, scope of study, project schedule and the background study.

During the inception phase, the business modeling and requirement workflow is given the most attention. In this initial phase, the literature reviews on the related work have been carried out. The idea, information, issues and problems that related to the VCD/ DVD ordering process are gathered. The information gathered and collected are mainly done through the reviewed from books, proceedings, articles and web site as secondary data.

In addition, a field observation has been done in the existence online home entertainment store such as Eastern Records Sdn. Bhd. despite critically reviewed the company's web site at http://eastern.com.my regarding the VCD/DVD ordering process.

Besides that, informal interviews were conducted at Golden Star VCD Store with the store owner and ten customers in order to analyze the existing problems and issues arise in the store and justify the study scope and objective. Consequently, the interviews have managed to provide an understanding on the basic requirements of this prototype system. Sample of questions asked during the interviews with store owner and customers are shown on Appendix A.

The project aims at building a start up version of web based VCD/DVD ordering system that suits to the user requirements with main functions. The current brick-and-mortar business process was confronted with some limitations. This includes the limited scope of sales due to the great competition in the existing market. In term of customers, they hope to achieve the more efficient service.

During the inception phase, the system development methodology has been identified. The customized RUP is used throughout the development of this project. The project schedule also has been planed as shown in Appendix B. The software tools that were needed during the system development are identified. The main software tools that used to develop the prototype system include the Apache Web Server, PHP version 4 scripting language, MySQL database and Macromedia Dreamweaver MX. This will be discussed more detail in Chapter Four.

Additionally, this phase also emphasizes on capturing the requirement of the project. The goal of the requirements is to describe what the system should do. During this phase, all external entities that will be interact with the system (actors) and the use cases (behavior of the

system) were identified. The use cases are developed according to the actor's needs. The outcomes of the inception phase are a project plan that shows phases and iterations involved, an initial business case related to order and an initial use case model.

Currently, buying a VCD/DVD in the brick-and-mortar store is a manual process whereby a customer need to walk-in to the shop, looks through the products displayed on the racks and find the preference products. After the customer has finished selecting products to purchase, they can proceed to the check out counter and pays for the purchases by cash or credit card. Thus, this kind of brick-and-mortar business tends to give the insufficient process of transactions when customers have to spend time in consuming the VCD/DVD products.

After identified the existing problems and limitations in the brick-and-mortar business, the requirement workflow defined the prototype system requirements for the web based ordering system. Since this is the start up version for VCD/DVD store, thus, this project builds a web based ordering system with the main functions that enable the customers order the products through the web based system. These functions were intended to provide a fundamental idea on what elements might go into a web based ordering system.

The requirements for this prototype system are derived from the customers' point of views. Basically, the customers are able to browse the products, add the products to the shopping cart and check out by specify account information. Thus, this web based ordering system need to have the capability to allow the potential customers to view the products offered and check the products availability, add the items to the shopping cart and if they wish to order any products, to create an account and check out to make an order.

Therefore, the use cases that have been decided in this prototype system are as following:

Customer Use Cases

- browse product list by category
- browse product list by genre
- browse product detail
- search product
- view cart
- create profile
- login
- edit profile
- check out

The detail of the actor and use cases will be discussed more detail in Chapter Four.

However, this prototype system of web based ordering excluded the secure server setup, the actual credit card processing and advanced features.

- *Elaboration phase*

Elaboration phase focuses on analysis and design workflow which is mainly for architecture and structure the system for the implementation workflow. This phase is the most critical of the four phases because the outcomes of this phase described a framework for the construction phase. This phase ensures the requirements and the development plan are stable enough to design. During this phase, the prototype system architecture was build based on the scope of the project.

This workflow performs the tasks and functions specified in the use case description in a specific implementation environment to fulfill all the captured requirements and contain robust structured that easy to

change if its functional requirements change. During this workflow, the activities for each use case are analyzed using UML notation. UML diagrams are used to represent the outcome of this workflow. The detail of these diagrams will be discussed more detail in Chapter Five.

Thus, the outcomes of the elaboration phase described a complete use case model with all use cases and actors being identified, use case descriptions being developed and the system architecture description which includes the sequence diagrams, collaboration diagrams, class diagram, data model for database design and navigation diagram. The design of nonfunctional mock-up of the system also has been produced during this phase.

- *Construction phase*

The construction phase focuses on implementation workflow. This workflow transmitted the outcomes of the previous phase into code. During this phase, all components and system features are implemented and integrated into the product. During this phase, the system architecture that defined in the elaboration phase was transforming the system development using the selected software tools.

Thus, this phase involves developing database using the selected software and writing a set of computer programs using scripting language. Therefore, this part concentrates on the software tools such as PHP version 4 scripting language, MySQL relational database, Apache Web Server and Macromedia Dreamveawer MX (for interface design) used for the system development.

Basically, the different function of the system contained in separate PHP files. All the files will be called upon in a master PHP file that controls which modules are processed. A brief discussion of this implementation will be included in Chapter Six.

On the other hand, this phase also emphasizes on testing workflow. Testing need to be done during this phase before approve any code for production. The purpose of testing is to verify that all requirements have been correctly implemented. However, this prototype system has limitation to provide additional code for error checking in any of the inputs for adding and editing the system information.

The outcomes of this phase are a product ready for its end users. However, seems this is a prototype of start up version for Web Based VCD/DVD Ordering System, there are many additional features to be added for the further development.

- *Transition phase*

The transition phase focuses on deployment workflow. The purpose of the transition phase is to converse the software product to the user community. Since this project is only a prototype, therefore, the development of this system does not reach the transition phase as the development of this system is still currently in the construction phase. Thus, this system did not involve the deployment workflow. However, when the project is to further, this phase will deploy the system on the web site for the user community.

At the end of the system development phases, Usability Testing has been conducted to evaluate the satisfaction of the store's customers and obtain the users feedback upon tried the system. Since the development workflow does not involve the deployment workflow, therefore, the test was carried out by using personal computer that connects to the local host server. At the end of the system development, the Usability Testing result has collected to evaluate the prototype system.

3.3 Summary

The chapter explained the customized RUP that has being used in building the prototype for the Web Based VCD/DVD Ordering System. This methodology involved three phases: inception, elaboration and construction. The inception phase focuses on requirement capturing. The elaboration phase focuses on analysis and designs the system by using the UML notation. The construction phase focuses on system implementation. This methodology helps to ensure the development process is carefully carried out step-by-step to avoid delay in the development process.

CHAPTER FOUR

INCEPTION PHASE

This chapter explains the inception phase, the first phase of the system development methodology used in this project. This phase defines a business case and project scope for the prototype system.

In this initial stage, the author defined a very important objective specifically known as "Customer Vision".

For this stage, the requirements were as follows:

- Initial Use Case Model
- Project Plan

Besides, the software that used during this project development was also identified.

At the end of this initial phase, the outcomes in the context of Golden Star VCD Store case study have produced the following contents:

- The customer vision of the project.
- The requirements of the prototype system.
- An initial use cases with all use cases and actor have been identified.
- A project plan stated what the first step is and what the next ones will be.
- The software tools that used in this project.

4.1 Customer vision

The customer vision being described here is the vision that target to be achieved by the case organization, the Golden Star VCD Store. Interview has been conducted in order to get its business aims. Observations have been carried out to review its current VCD/DVD ordering experience.

4.1.1 Interview

As mentioned in the previous chapter, unstructured interview was conducted with the VCD store owner in order to analyze the existing system problem and also to define the scope, objective and goals of this project. The interview provides understandings and reviews on the needs of the current system.

4.1.2 Business aims

Currently, this store runs its business with the walk-in customers and all the business transactions were done manually. According to the owner of this VCD store, the current VCD market faces fierce competition. The owner admitted that it is difficult to increase the sales in the existing market because the customers always preferred better services that are easy and convenient. Therefore, the owner intended to provide a web based ordering system for enhancing its services for the customers and gain the competitive advantage from the existing business. Thus, the owner concurred to use Web Based VCD/DVD Ordering System to achieve the new business goal to increase sales and expand the market throughout the country.

Additionally, the unstructured interview was also conducted with ten VCD store's customers in order to analyze the requirements for the prototype system. In general, the majority of the customers face the problem where the interested VCD being search is out of stock or not available in that particular time span. The interview revealed that most

of the customers support the idea of building up the web based ordering system. Furthermore, the customers acquired the system requirements in providing information regarding the products availability, ability to preview the movie trailer on the web, and moreover can easily search his or her particular interested movie VCD/DVD.

Thus, this project aims to build a prototype of a Web Based VCD/ DVD Ordering System that suits the user requirement to achieve the organization requirement.

4.1.3 Review on current VCD/DVD ordering experience

Any good system first starts with the requirement study. Since this project develop web based ordering system for the VCD/DVD movie products, thus, review on the current VCD/DVD ordering experience has been conducted.

Several observations have been carried out to the VCD/DVD stores. However, this project is based on the observation that has been done specifically on Golden Star VCD Store to see how this store displays the products on the rack and sells the products to their potential customers. Golden Star VCD Store is a brick-and-mortar store that mainly sells the VCD/DVD movie products. Generally, this store displays the products by category: best selling movie and new release movie, VCD and DVD. A customer visiting the store, looks through the products displayed on the racks, finds the preference products and carries the products in hand. If the customer is interested the best selling or new release movie, he or she can requires it at the counter because this product category is placed at the counter and is the most frequent movie that required by the customers. After the customers have finished selecting products for purchase, he or she can proceeds to the checkout counter and pays for their purchases by credit card or cash.

4.2 Requirement

The requirement being discussed here is the requirements for the Web Based VCD/ DVD Ordering Prototype System. The system requirements for this prototype are being discussed in term of the functionality requirements and usability requirement.

4.2.1 System requirements

The procedures for setting up the web based ordering system are analogous to the above scenario. Thus, the functional requirements and usability requirement have been identified as following:

- *Functional requirements*

Functional requirements describe what a system does or is expected to do, often refer to as its functionality (Bennett, McRobb, & Farmer, 2002). The objective of this project is to deliver a prototype with the main web based ordering functionality in start up a web based system for movie VCD store as well as some features required by the customers.

Thus, the prototype of Web Based VCD/DVD Ordering System needs to be able to provide the following functions to the customer:

1. Display the product items by category
2. Display the product items by genre
3. Display search results according to the product name
4. Display the shopping cart detail
5. Store the customer information
6. Check login customer using login ID and password
7. Update the customer information
8. Receive the customer order

- *Usability requirement*

Usability requirements referred to the stage that enable the setting requirements between the developed system and both users of the system to be paralleled with the tasks that will be undertaken when using it (Bennett, McRobb, & Farmer, 2002). According to ISO 9241, the dimensions of usability can be best described as effectiveness, efficiency and satisfaction (Keinonen, 1999). The start up version for web based ordering system need implement enough functionality so that this system would be attractive to most customers as well as easy to use.

Thus, in this project, the usability requirement is concerned with the customers' satisfaction towards this prototype system. Customers' satisfaction measures usability from the point of the comfort and acceptability of the used system. The satisfaction can be measured subjectively by questionnaires

4.3 Initial use case model

Use case model contains an identification of the actor, the use cases and the use case descriptions. For the initial use case model, the actor and use cases that involve in this prototype system were identified. The following are the actor and use cases that have been identified from the above study.

4.3.1 The actor

Table 4.1 shows the actor (customer) that will going to use this system to order the products from the case organization.

Table 4.1: The actor

Actor	*Description*
Customer	A customer of Golden Star. A person that wishes to order the products of Golden Star.

4.3.2 The use cases

Table 4.2 shows the use cases for the system. Use cases are descriptions of the functionality of the system from the user's perspective.

As a result, the use case diagram was developed based on the actor and use cases that have been identified. Use case diagram is used to show the functionality that the system will provide and to show which users will communicate with the system in some way to use that functionality (Bennett, McRobb, & Farmer, 2002). Figure 4.1 shows the use case diagram for the web based VCD ordering prototype system.

Table 4.2: The use cases

Use Case	*Description*
Browse product category	Customer may view products by category. The product category must be selected first. The title of all the products related to the category will be displayed. The customer will be able to select a title and view its details.
Browse product genre	Customer may view products by genre. The product genre must be selected first. The title of all the products related to the genre will be displayed. The customer will be able to select a title and view its details.
Search product	The product can be searched by the product name. The entire product with the related product name will be displayed.
View shopping cart	Customer may view the product (with its related information) that has added to the shopping cart.
Create customer profile	Customer can create the customer profile, which records personal information and credit card detail.
Login	The customer that has created a customer profile can login to the system by using login ID and password.
Update customer profile	Records when the customer profile is changed.
Check out	Check out will send the customer order to the administration for processing.

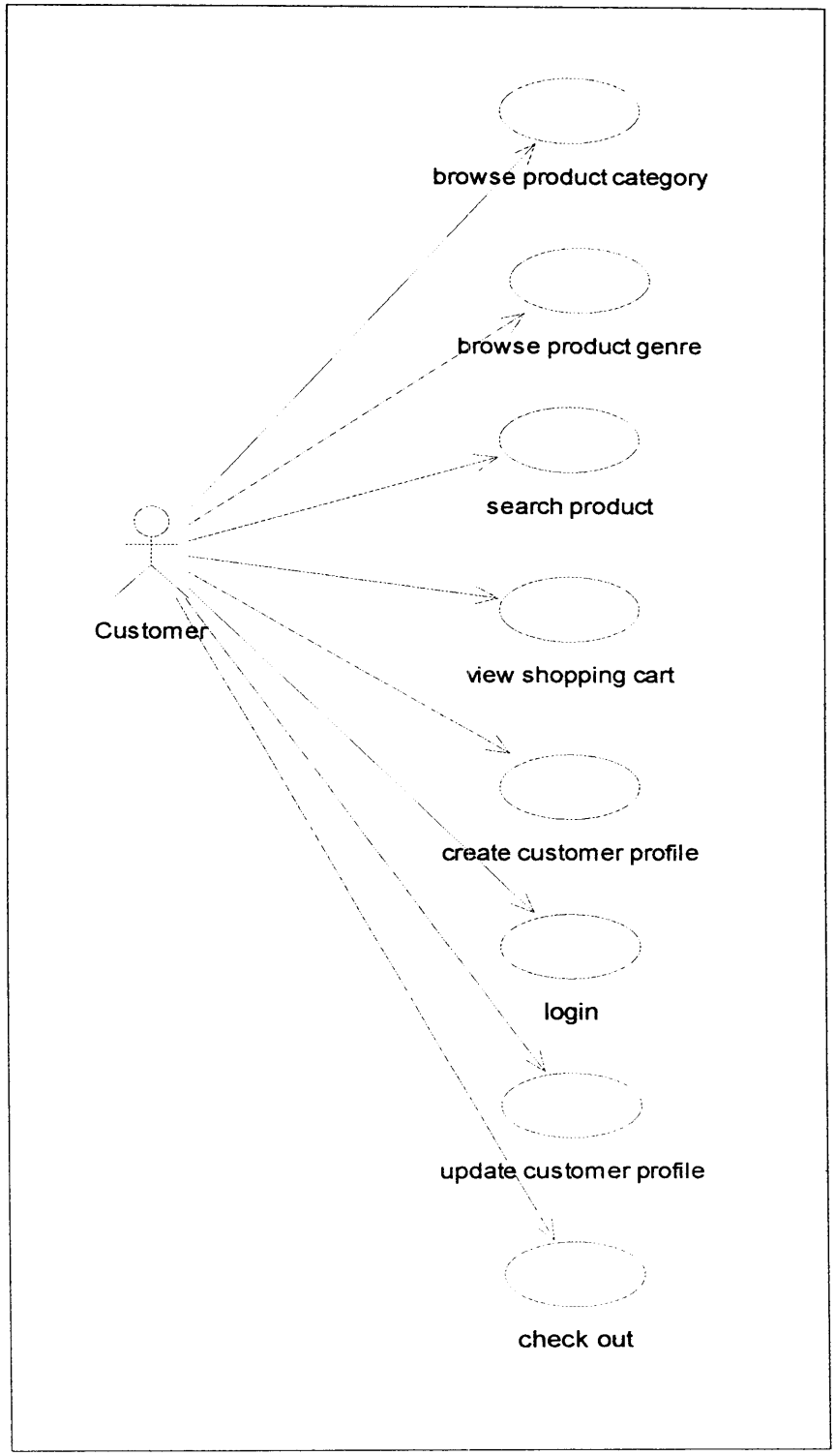

Figure 4.1: The use cases diagram

4.4 Project plan

The project schedule has been planned to shows what the first step is and what the next ones will be done for this project. Appendix B shows the Gantt chart of the project plan. The chart shows the details of the development phase with a specific period. It includes the preparation of the seminar paper and final report that documents the whole development process.

4.5 Software used

Table 4.3 listed down the software tools used for this project. The reasons of why such software is used are explained.

Table 4.3: Software used

Application	*Software used*	*Reasons*
Database	MySQL 3.23	MySQL is the most popular open source database. MySQL has many attractive features, such as speed, ease of use, capability and portability (Dubois, 2000). 1.) MySQL is very fast. The developers contend that MySQL is about the fastest database (this claim is contained in http://www.mysql.com/benchmark.html, a performance-comparison page on the MySQL web site). 2.) MySQL is a high-performance but relatively simple database system and is much less complex to set up and administer than larger system. 3.) MySQL was originally developed to handle very large databases much faster than existing solutions. Many clients can connect to the server at the same time.

		4.) MySQL is portable to runs on UNIX, as well as on other non-UNIX systems, such as Windows and OS/ 2. For more advantages of using MySQL database, please visit to: http://www.mysql.com.
Programming Tools	PHP version 4	PHP is a scripting languages that been widely used by web programmers. The PHP code can be inserted directly alongside HTML makes the language all the more convenient. PHP supports a large set of platform such as Linux and Windows NT. This programming tool also contains support for accessing several databases, including MySQL and a variety of web servers, including Apache.
Web Server	Apache 1.3	Apache is HTTP servers that helps running the system. Apache Web Server is an open source that can download from the Internet and easily use to develop the prototype system.
HTML Tools (for interface design)	Dreamweaver MX	Dreamweaver MX is used for interface design. This tool can directly connect to the MySQL database and friendly to view the PHP coding.
Editor	PHP Coder Pro	Since PHP programming is used, thus the best software to write PHP coding is PHP Coder Pro. This editor is easy to use and enable the developer to view the results using HTML preview.
Analysis and Design System	Rational Rose 2000	Rational Rose provides UML notation for drawing models of the diagrams. It is easy to use and understand. Moreover, this tool supports for Unix, Windows and OS-2 platforms.

Web browser	Internet Explorer 6.0	This tool is used at client side to view the web page. Since this prototype is a web based system, this tool is required to fulfill the project requirements.
Operating System	MS Windows XP	MS Windows is the common the mostly used operating system. In this project, Windows XP is used for the operating system.
Documentation	MS Word	This tool is popular software that used for all kind of documentation.

4.6 Summary

In brief, this chapter has explained the first phase of the system development methodology used in this project that defined a business case for the prototype system and justified the scope of study. The outcomes of this phase include the business vision, initial use cases and project plan. The software tools used for this project also have been identified during this initial phase. Finally, these outcomes used for the next phase, elaboration phase to continue on analysis and design the prototype system.

CHAPTER FIVE

ELABORATION PHASE

This chapter explains the elaboration phase, the second phase of the system development methodology used in this project. This phase is the most critical phase because the outcomes of this phase will be a framework for the construction phase. This phase pulls together all of the initial business requirements from the inception phase and focuses on detailed analysis of the problem domain and the definition of an architectural foundation for the project.

During inception phase, the following outcomes were defined:

- A complete use case model with use case descriptions
- Interaction diagrams consist of sequence diagrams and collaboration diagrams
- Class diagram
- Data model for database design
- Navigation diagram
- Non-functional mock-up

5.1 Use case model

A use case model consists of the actor, use cases, use case diagram and use case descriptions.

5.1.1 Use case descriptions

Based on the initial use case model that have been identified from the previous phase, the use case descriptions are elaborated to provide more detail about the interaction between the actor and the system. The following are the use case descriptions for each use case:

- *Use case description: Browse product category*

The use case description to browse product category is illustrated in Table 5.1.

Table 5.1: Use case description to browse product category

Use Case : Browse product category Actor : Customer Description : Customer may view products by category. The product category must be selected first. The title of all the products related to the category will be displayed. The customer will be able to select a title and view its details.	
Typical Course of Events	
Actor Action	*System Response*
1) Customer clicks on any product category.	Displays a list of specified product category that displaying the product name, stock availability and price.
2) Customer clicks on any listed product.	Displays details of the specified product displaying more information about this item: item image, item description and item movie trailer (if movie trailer is available). If the item is currently in stock, the customer can to go further to add item to the shopping cart with require quantity. If the item is currently out of stock, the customer is stop to go further.
3) Customer clicks on "Add to Shopping Cart".	Displays confirmation message that item has added to the shopping cart.

- *Use case description: Browse product genre*

The use case description to browse product genre is illustrated in Table 5.2.

Table 5.2: Use case description to browse product genre

Use Case : Browse product category Actor : Customer Description : Customer may view products by genre. The product genre must be selected first. The title of all the products related to the genre will be displayed. The customer will be able to select a title and view its details.	
Typical Course of Events	
Actor Action	*System Response*
1) Customer clicks on any product genre.	Displays a list of specified product genre that displaying the product name, stock availability and price.
2) Customer clicks on any listed product.	Displays details of the specified product displaying more information about this item: item image, item description and item movie trailer (if movie trailer is available). If the item is currently in stock, the customer can to go further to add item to the shopping cart with require quantity. If the item is currently out of stock, the customer is stop to go further.
3) Customer clicks on "Add to Shopping Cart".	Displays confirmation message that item has added to the shopping cart.

- *Use case description: Search product*

The use case description to search product is illustrated in Table 5.3.

Table 5.3: Use case description to search product

Use Case :	Search product
Actor :	Customer
Description :	The product can be search by the product name. The entire product with the related product name will be displayed.
Typical Course of Events	
Actor Action	*System Response*
1) Customer enters any item name.	Displays a list of item related to the item name that have entered, displaying the product name, stock availability and price.

- *Use case description: View shopping cart*

The use case description to view shopping cart is illustrated in Table 5.4.

Table 5.4: Use case description to view shopping cart

Use Case :	View shopping cart
Actor :	Customer
Description :	Customer may view the product (with its related information) that has added to the shopping cart.
Typical Course of Events	
Actor Action	*System Response*
1) Customer clicks on "My Cart".	Displays "My Cart" information that displaying product name, price, quantity and total.

- *Use case description: Create customer profile*

The use case description to create customer profile is illustrated in Table 5.5.

Table 5.5: Use case description to create customer profile

Use Case :	Create customer profile
Actor :	Customer
Description :	Customer can create the customer profile, which records personal information and credit card detail.
Typical Course of Events	
Actor Action	*System Response*
1) Customer clicks on "My Account".	Displays "Create a New Account" form.
2) Customer fills in the form and click on "Create Account" button.	System inserts customer information into the database and display confirmation message.

- *Use case description: Login*

The use case description to login is illustrated in Table 5.6.

Table 5.6: Use case description to login

Use Case :	Login
Actor :	Customer
Description :	The customer that has created a customer profile can login to the system by using login ID and password.
Typical Course of Events	
Actor Action	*System Response*
1) Customer clicks on "Login".	Displays a pop up box to fill in the customer ID and password. If the entered customer ID and password is correct, system displays option for "My Account" and "Check Out". If not, system displays the error message and redirect customer to the home page.

- *Use case description: Update customer profile*

The use case description to update customer profile is illustrated in Table 5.7.

Table 5.7: Use case description to update customer profile

Use Case : Update customer profile Actor : Customer Description : Records when the customer profile is changed.	
Typical Course of Events	
Actor Action	*System Response*
1) Customer clicks on "Login".	Displays a pop up box to fill in the customer ID and password. If the entered customer ID and password is correct, system displays option for "My Account" and "Check Out". If not, system displays the error message and redirect customer to the home page.
2) Customer clicks on "My Account".	Displays the customer profile.
3) Customer edits the profile and click "Update".	System inserts customer information into the database and display confirmation message.

- *Use case description: Check out*

The use case description to check out is illustrated in Table 5.8.

Table 5.8: Use case description to check out

Use Case : Check out Actor : Customer Description : Check out will send the customer order to the administration for processing.	
Typical Course of Events	
Actor Action	*System Response*
1) Customer selects the product and adds to the cart.	Displays the cart information.
2) Customer clicks on "Login".	Displays a pop up box to fill in the customer ID and password. If the entered customer ID and password is correct, system displays option for "My Account" and "Check Out". If not, system displays the error message and redirect customer to the home page.
3) Customer clicks on "Check Out".	Get the cart information that order by the customer and display confirmation message.

5.2 Interaction diagrams

An interaction refers to a specific pattern of message exchange to accomplish a specific purpose. There are two types of interaction diagrams, which are sequence diagrams and collaboration diagrams.

5.2.1 Sequence diagrams

Based on the use case description, the sequence diagrams have produced. Sequence diagram displays the time sequence of the objects participating in the interaction. This consists of the vertical dimension (time) and horizontal dimension (different objects). The following are the sequence diagrams for the Web Based VCD/DVD Ordering Prototype System.

- *Browse product category*

The sequence diagram to browse product category is illustrated in Figure 5.1.

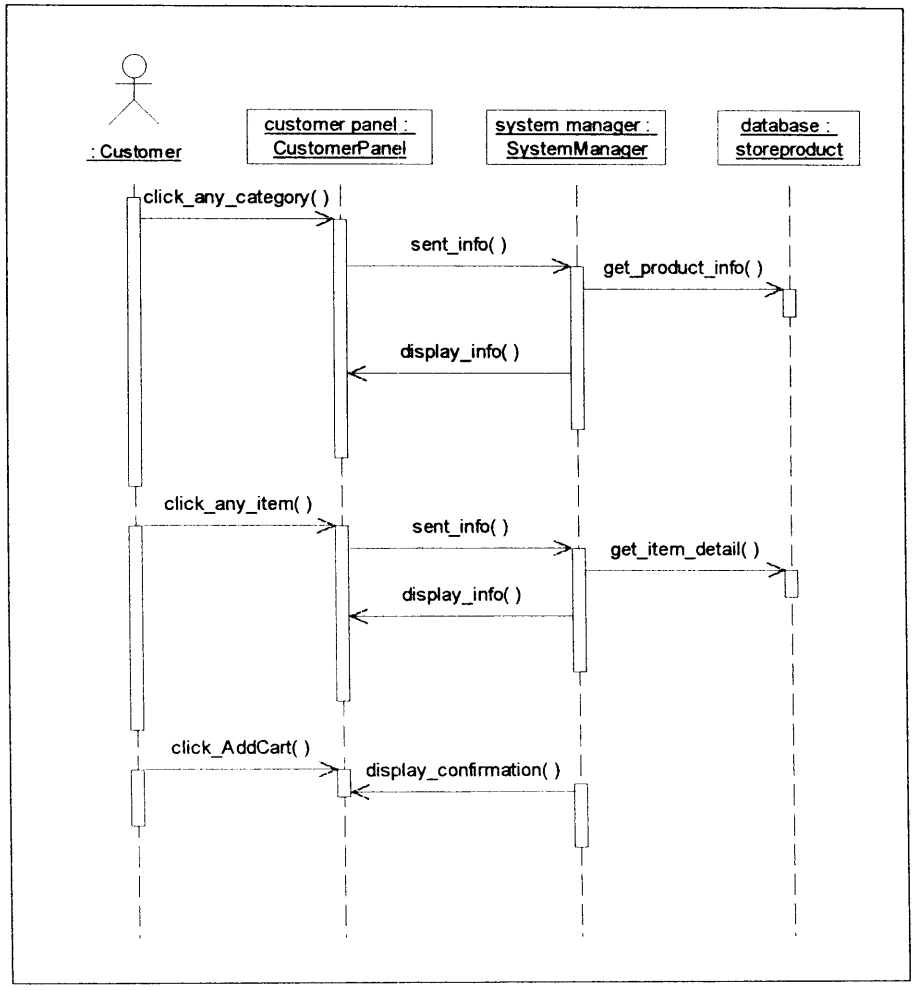

Figure 5.1: Sequence diagram to browse product category

- *Browse product genre*

The sequence diagram to browse product genre is illustrated in Figure 5.2.

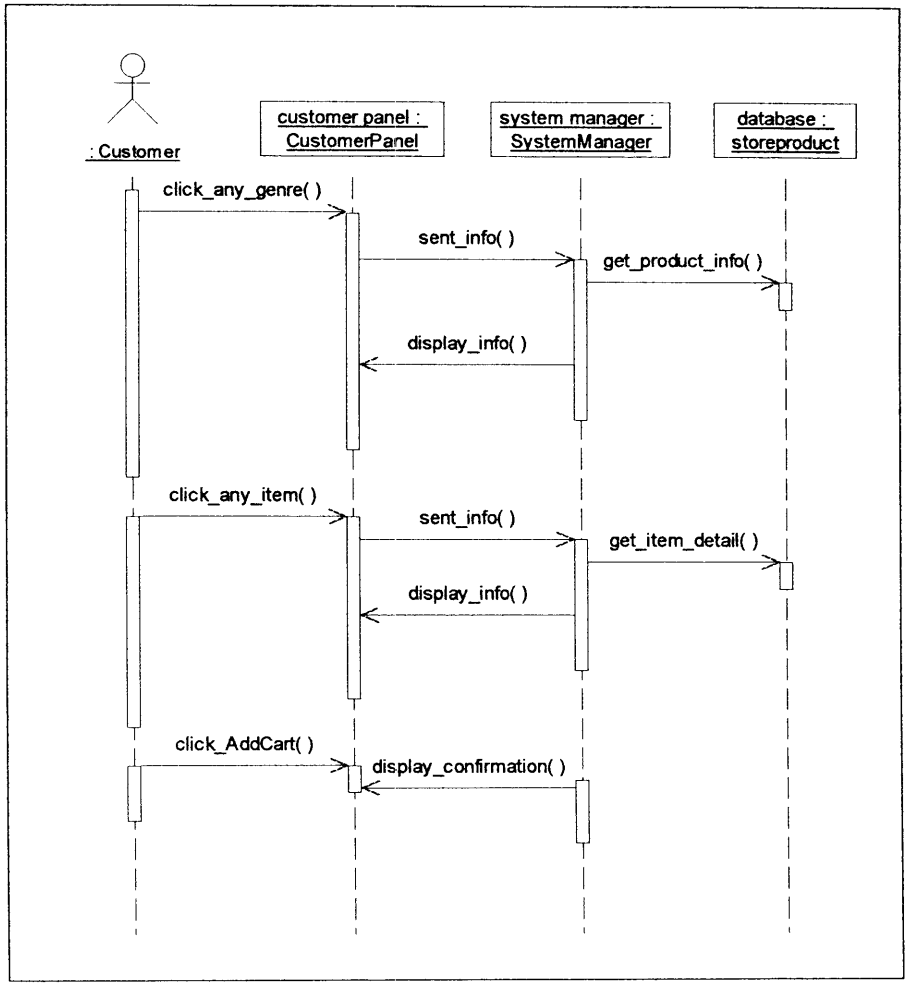

Figure 5.2: Sequence diagram to browse product genre

- *Search product*

The sequence diagram to search product is illustrated in Figure 5.3.

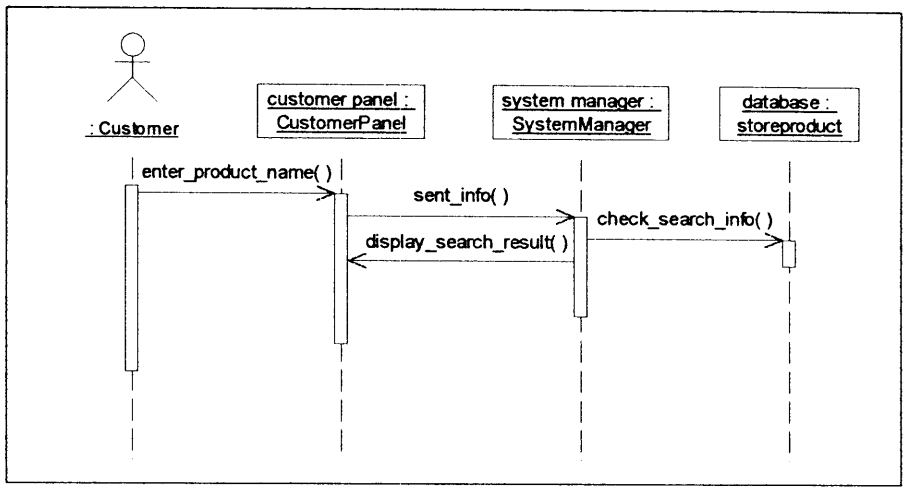

Figure 5.3: Sequence diagram to search product

- *View shopping cart*

The sequence diagram to view shopping cart is illustrated in Figure 5.4.

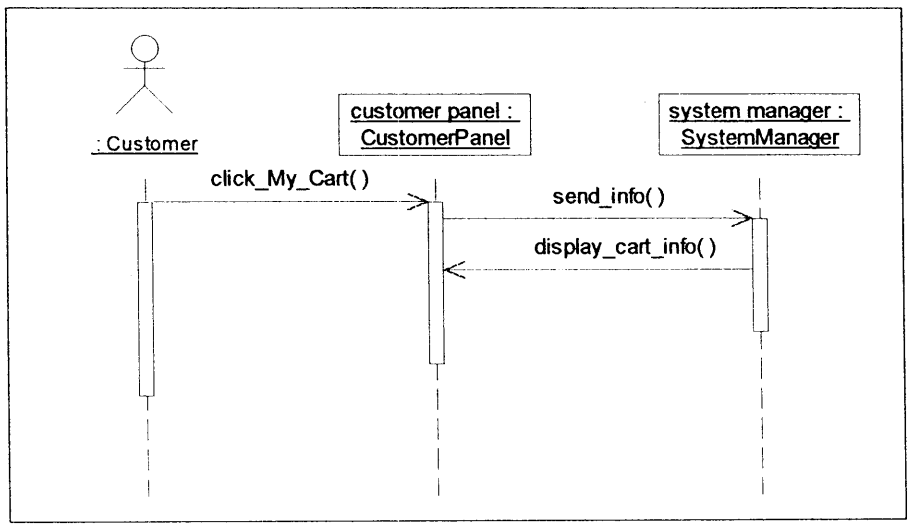

Figure 5.4: Sequence diagram to view shopping cart

- *Create customer profile*

The sequence diagram to create customer profile is illustrated in Figure 5.5.

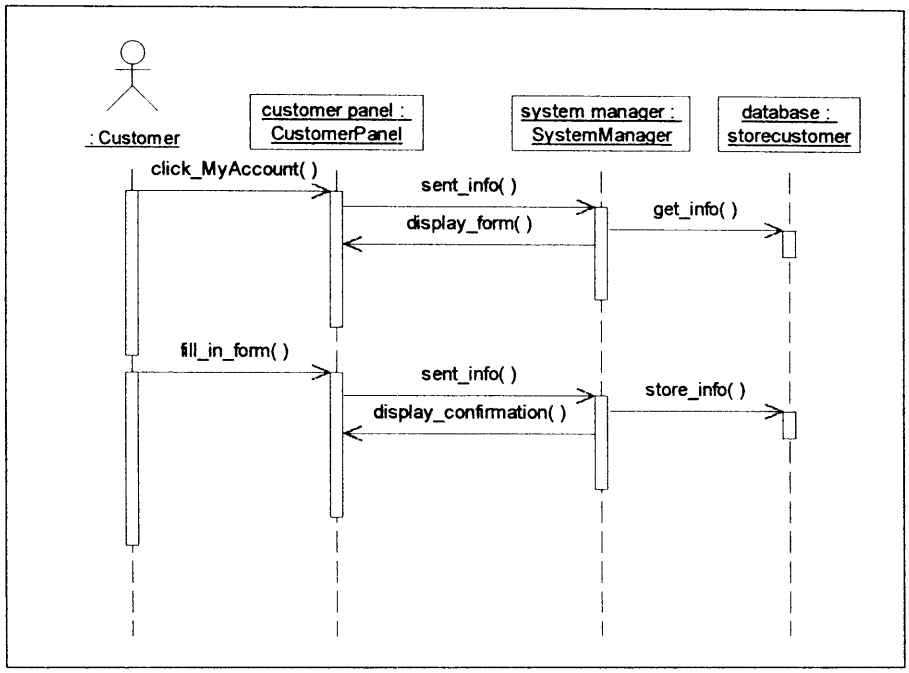

Figure 5.5: Sequence diagram to create customer profile

- *Login*

The sequence diagram to login is illustrated in Figure 5.6.

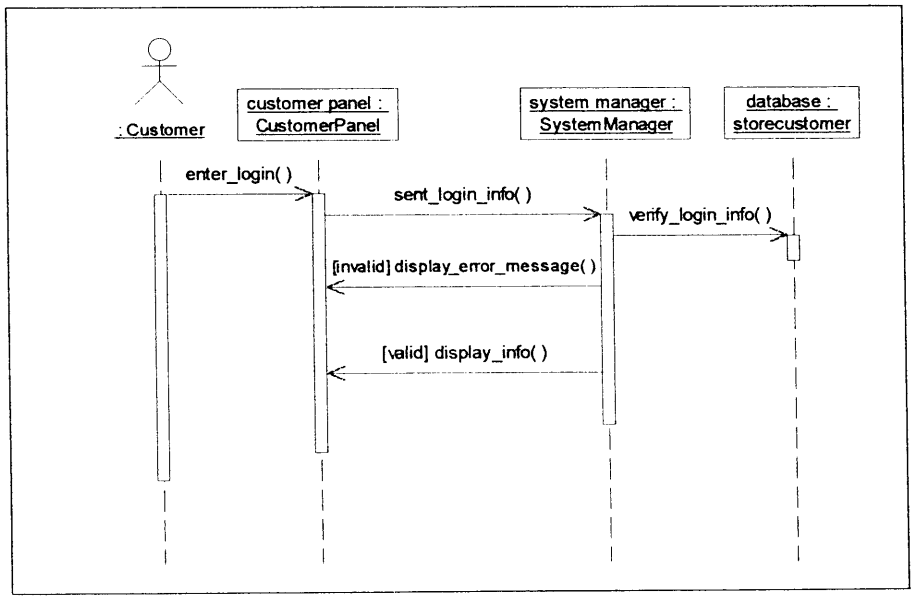

Figure 5.4: Sequence diagram to login

- *Update customer profile*

The sequence diagram to update customer profile is illustrated in Figure 5.7.

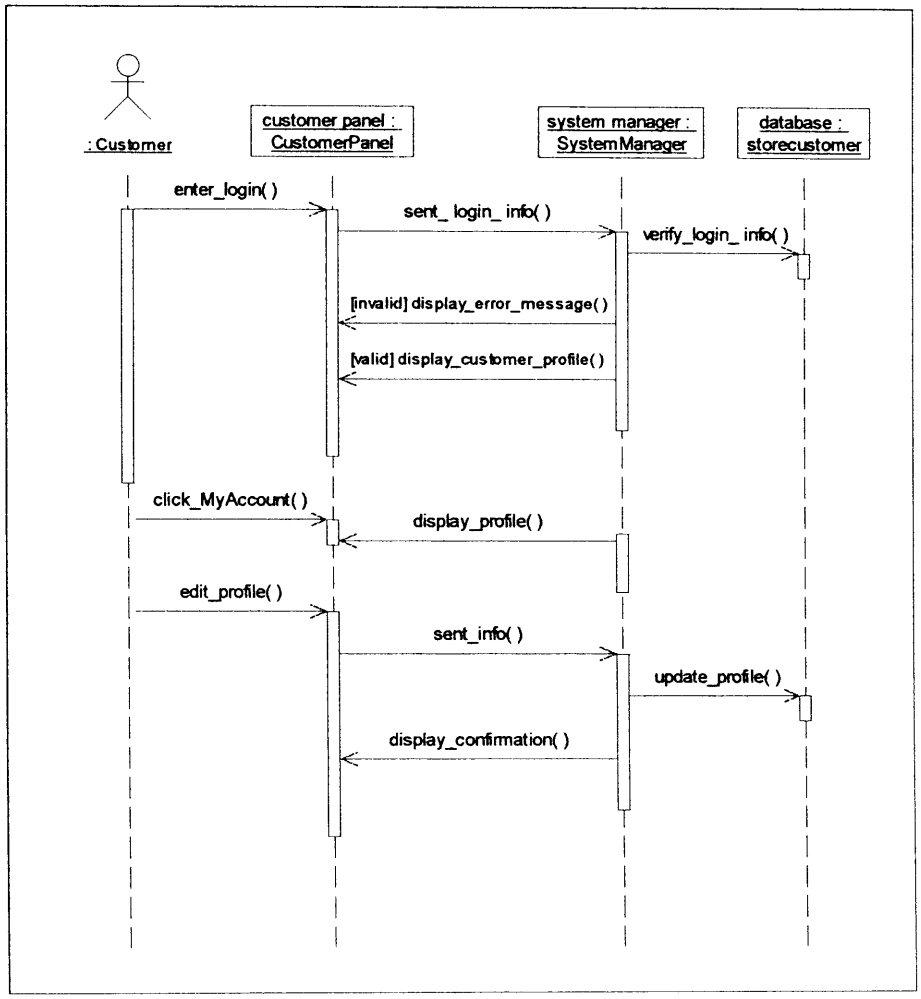

Figure 5.7: Sequence diagram to update customer profile

- *Check out*

The sequence diagram to check out is illustrated in Figure 5.8.

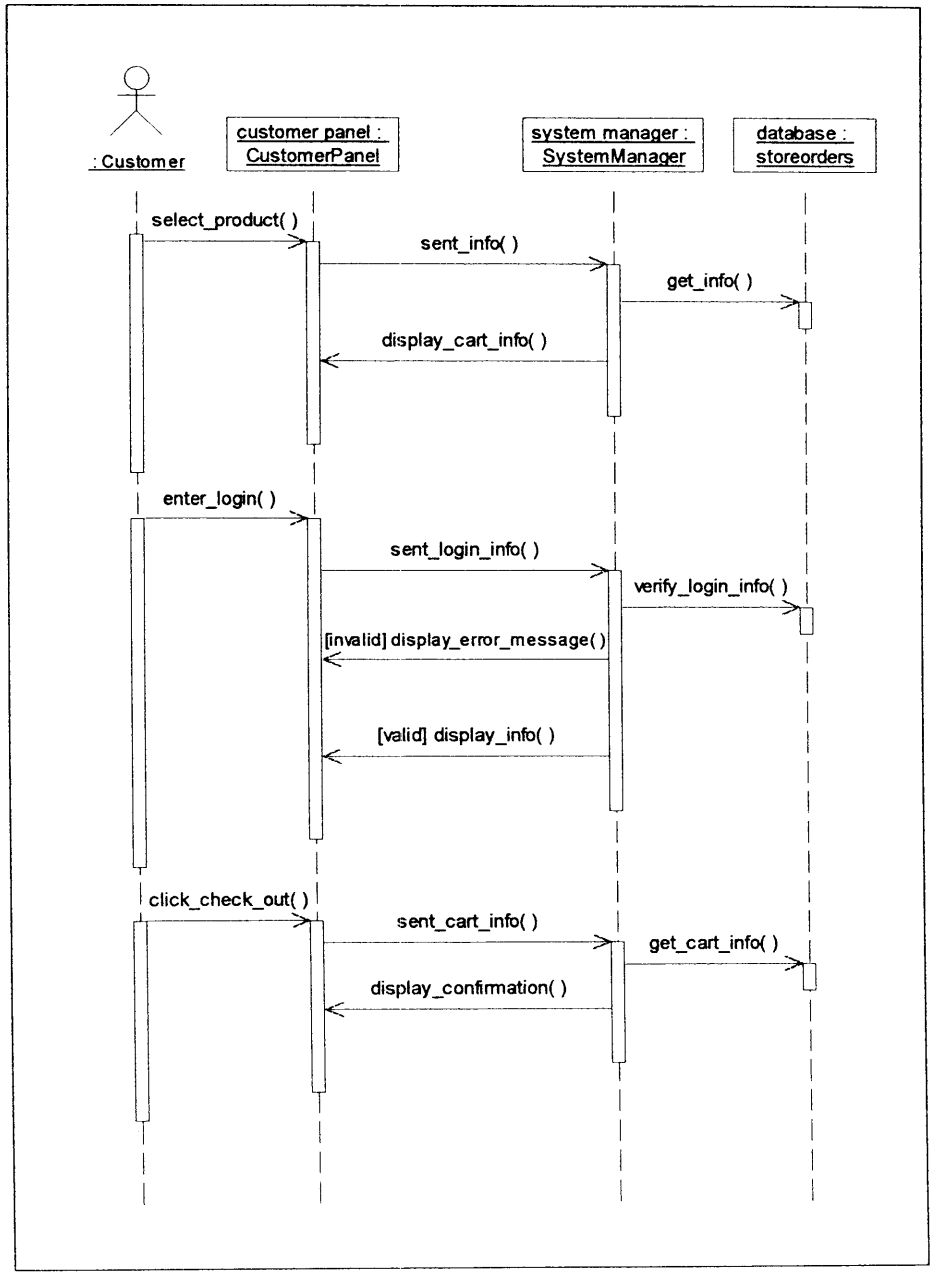

Figure 5.8: Sequence diagram to check out

5.2.2 Collaboration diagrams

Based on the sequence diagrams that have been developed, the collaboration diagrams can be produced. The collaboration diagrams display an interaction organized around the objects and their links to one another. Numbers are used to show the sequence of messages. The examples of the collaboration diagrams for Web Based VCD/DVD Ordering Prototype System are provided in the Appendix C.

5.3 Class diagram

Based on the sequence diagrams, the class diagram was produced. This diagram helps to design the data model for database. Figure 5.9 shows the class diagram for Web Based VCD/ DVD Ordering Prototype System with its primary key, attributes and relationship between objects in the database.

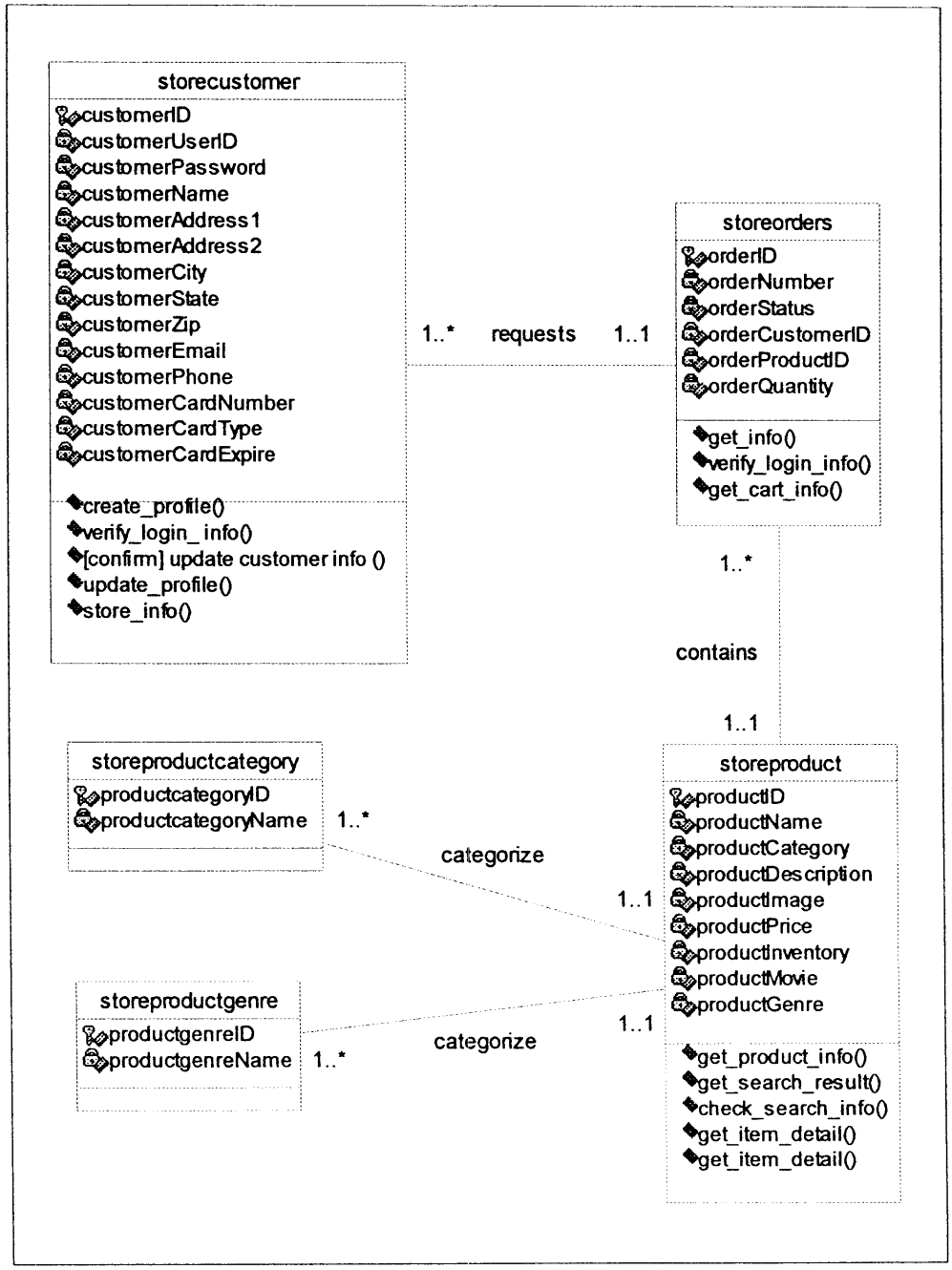

Figure 5.9: The class diagram

5.4 Data model for database design

Based on the class diagram, the data model for database has produced. These data model are important to set up the database for this prototype system. The following shows the data model for each table.

Table 5.9: storecustomer

Field	*Type*	*Length*	*Description*
customerID	int	12	A unique ID for each customer
customerUserID	varchar	20	Customer user ID
customerPassword	varchar	20	Customer password
customerName	varchar	50	Customer name
customerAddress1	varchar	50	Customer first address
customerAddress2	varchar	50	Customer second address
customerCity	varchar	30	Customer address city
customerState	varchar	20	Customer address state
customerZip	varchar	12	Customer address postal code or postcode
customerEmail	varchar	50	Customer email
customerPhone	varchar	20	Customer contact phone number
customerCardNumber	varchar	50	Customer credit card number
customerCardType	varchar	20	Customer credit card type
customerCardExpire	varchar	10	Customer credit card expired date

Table 5.10: storeproduct

Field	*Type*	*Length*	*Description*
productID	int	12	A unique ID for each product
productName	varchar	50	Product name
productCategory	int	12	Product category
productDescription	varchar	200	Product description
productImage	varchar	100	Product image
productPrice	varchar	10	Product price
productInventory	varchar	10	Product inventory
productMovie	varchar	200	Product movie
productGenre	int	12	Product genre

Table 5.11: storeorders

Field	*Type*	*Length*	*Description*
ordered	int	12	A unique ID for each order
orderNumber	varchar	10	Order number
orderStatus	varchar	20	Order status
orderCustomerID	int	12	ID of the customer this order value applies to
orderProductID	int	12	ID of the product this order value applies to
orderQuantity	int	12	Order quantity

Table 5.12: storeproductcategory

Field	*Type*	*Length*	*Description*
productcategoryID	int	12	A unique ID for each category
productcategoryName	vachar	50	Product category name

Table 5.13: storeproductgenre

Field	*Type*	*Length*	*Description*
productgenreID	int	12	A unique ID for each genre
productgenreName	vachar	50	Product genre name

5.5 Navigation diagram

Navigation diagram is produced to give an overview on how the customer navigates the web site. This is important to provide a rough idea to develop the prototype system. Figure 5.10 shows the navigation diagram for the Web Based VCD/DVD Ordering System.

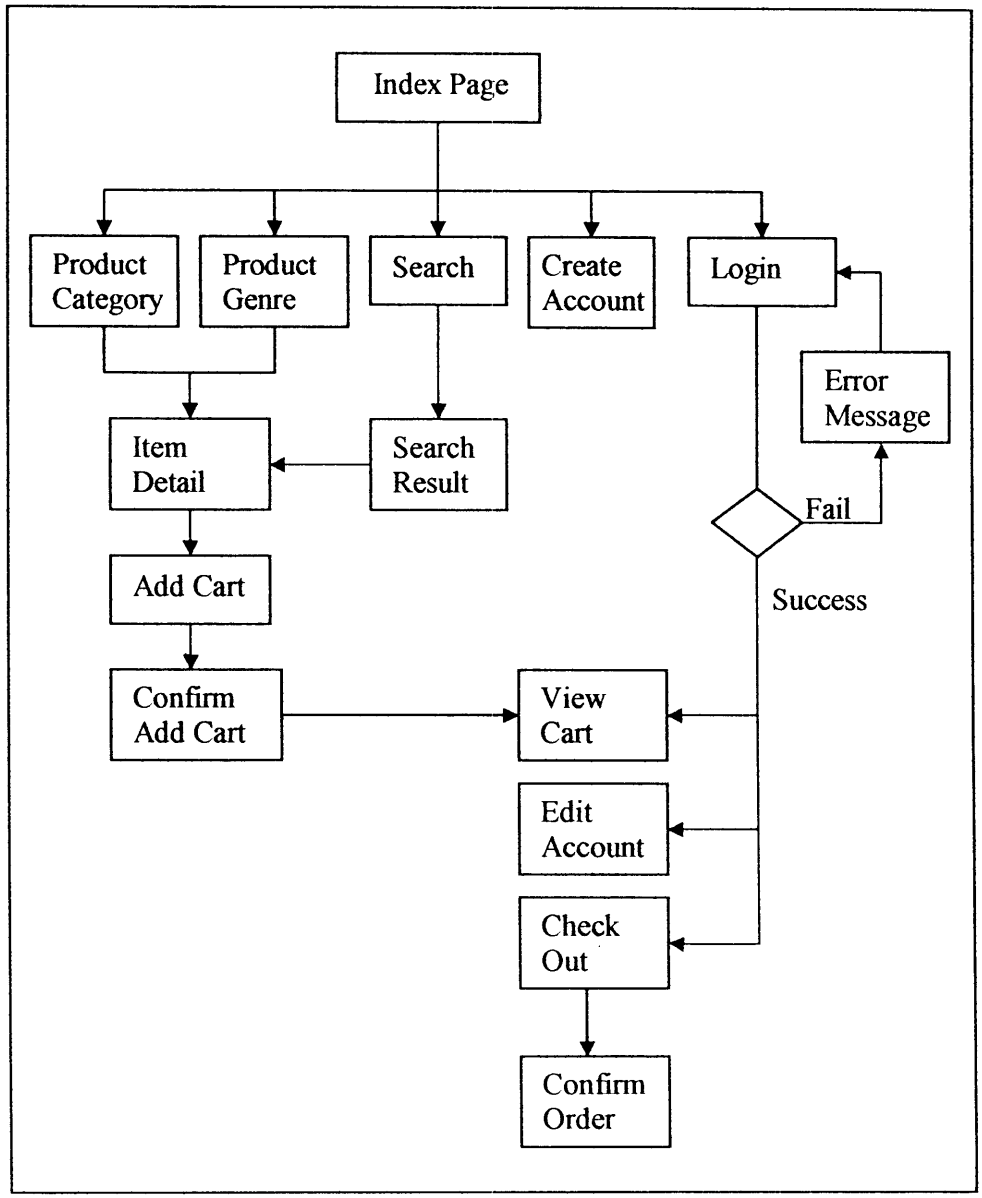

Figure 5.10: The navigation diagram

5.6 Non-functional mock-up

With the produced navigation diagram, the rough drawing of the index page is designed, which includes the navigation of the product category, product genre, search engine, login and create account. Figure 5.11 shows the non-functional mock-up for the index page of the Web Based VCD/DVD Ordering Prototype System.

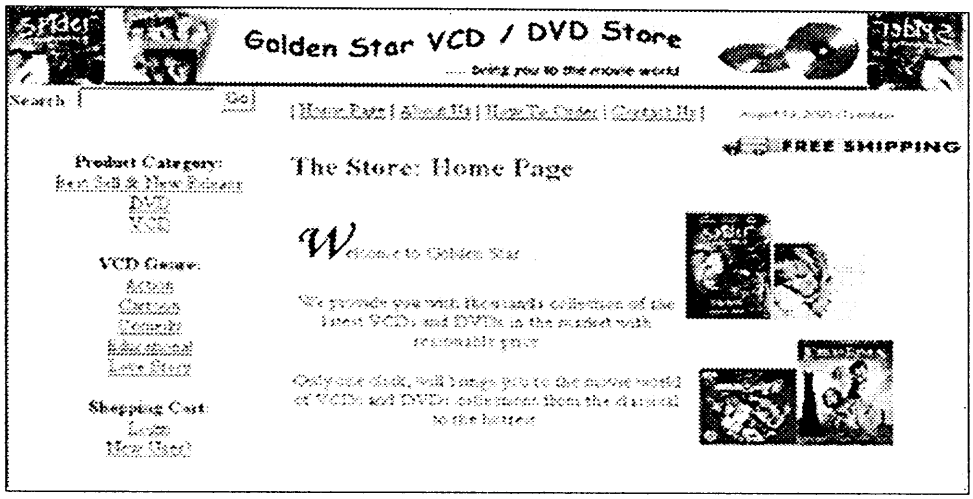

Figure 5.11: Non-functional mock-up

5.7 Summary

This chapter detailed on analysis of the problem domain and the definition of an architectural foundation for the project. The outcomes of this phase include a complete use case model with use case descriptions, interaction diagrams consists of sequence diagrams and collaboration diagrams, class diagram, data model for database design, navigation diagram and the design of a non-functional mock-up of the system. Finally, the outcomes of this phase have produced a framework for the construction phase to build the prototype system.

CHAPTER SIX

CONSTRUCTION PHASE

This chapter explains the construction phase, the third phase of the system development methodology used in this project. This phase focuses on implementing the Web Based VCD/DVD Ordering System to start up the web based system for the brick-and-mortar business. During this phase, the system architecture that has been defined in the previous phase is transformed into codes using the selected software tools. The outcome of this phase is a product ready for its end users that consists of the user manual (refer Appendix G). Nevertheless, since this is a prototype web-based ordering system to get started, many additional features should be added for the further development.

6.1 Web store application architecture

A web store application typically consists of multiple tiers. The middle tier consists of web store that hosts the web pages whereby it generates a catalog of the products to display to the customer. The database tier stores the product information, customer details and order information. The client tier provides the user interface and allows user interaction where the customer makes their selections and adds the selected products to the shopping cart (Allamaraju *et. al.*, 2001). The software tools that have been identified earlier were used to architecture the web store application. The architecture is illustrated as Figure 6.1.

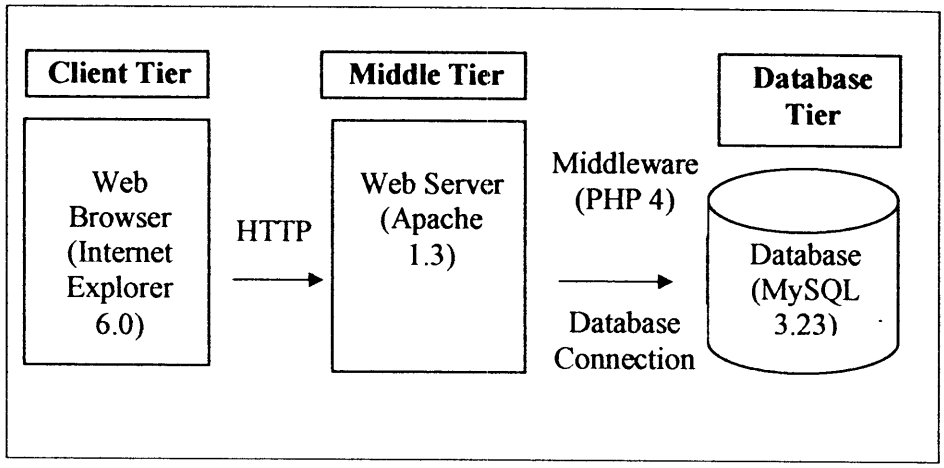

Figure 6.1: Web store application architecture

A user interacts with a web site via a browser. A browser is an application that runs on a client machine that connects to a server on a network and requests a page of information. The browser knows how to communicate (via HTTP) to a web server and how to render formatted information returned by the web server. Users navigate the web by clicking on links and requesting pages from web servers that connect to the database through the web server.

In this study, Apache is chosen as a web server. For the middleware, PHP 4 is chosen. PHP is the most often runs as an Apache extension, known as the Apache module. PHP belongs to a class of languages known as middleware. This language works closely with the web server to interpret the requests made from the World Wide Web, process these requests, interact with other programs on the server to fulfil the request and then indicate to the web server exactly what to serve to the client's browser. For the database, MySQL is chosen because it is free and extremely fast for small-to-medium size databases.

6.2 Setting up the database

The Web Based VCD/DVD Ordering System has the ability to allow the potential customers to view all the products and if he or she wanted to purchase anything, to create an account and then placed the order. Thus, a database is needed to store the information about the products, customer and orders. Consequently, the implementation of web based ordering system begins by creating a database for the prototype using MySQL 3.23. Based on the data model for database design, the tables of storecustomer, storeproduct, storeorders, storeproductcategory and storeproductgenre have produced as shown as Figure 6.2.

```
CREATE TABLE `storecustomer` (
  `customerID` int(12) NOT NULL auto_increment,
  `customerUserID` varchar(20) NOT NULL default '',
  `customerPassword` varchar(20) NOT NULL default '',
  `customerName` varchar(50) NOT NULL default '',
  `customerAddress1` varchar(50) NOT NULL default '',
  `customerAddress2` varchar(50) NOT NULL default '',
  `customerCity` varchar(30) NOT NULL default '',
  `customerState` varchar(20) NOT NULL default '',
  `customerZip` varchar(12) NOT NULL default '',
  `customerEmail` varchar(50) NOT NULL default '',
  `customerPhone` varchar(20) NOT NULL default '',
  `customerCardNumber` varchar(50) NOT NULL default '',
  `customerCardType` varchar(20) NOT NULL default '',
  `customerCardExpire` varchar(10) NOT NULL default '',
  PRIMARY KEY (`customerID`)
) TYPE=MyISAM;

CREATE TABLE `storeorders` (
  `orderID` int(12) NOT NULL auto_increment,
  `orderNumber` varchar(10) NOT NULL default '',
  `orderStatus` varchar(20) NOT NULL default '',
  `orderCustomerID` int(12) NOT NULL default '0',
  `orderProductID` int(12) NOT NULL default '0',
  `orderQuantity` int(12) NOT NULL default '0',
  PRIMARY KEY (`orderID`)
) TYPE=MyISAM;

CREATE TABLE `storeproduct` (
  `productID` int(12) NOT NULL auto_increment,
  `productName` varchar(50) NOT NULL default '',
```

```
  `productCategory` int(12) NOT NULL default '0',
  `productDescription` varchar(200) NOT NULL default '',
  `productImage` varchar(100) NOT NULL default '',
  `productPrice` varchar(10) NOT NULL default '0.00',
  `productInventory` varchar(10) NOT NULL default '',
  `productMovie` varchar(200) default NULL,
  `productGenre` int(12) NOT NULL default '0',
  PRIMARY KEY (`productID`)
) TYPE=MyISAM;

CREATE TABLE `storeproductcategory` (
  `productcategoryID` int(12) NOT NULL auto_increment,
  `productcategoryName` varchar(50) NOT NULL default '',
  PRIMARY KEY (`productcategoryID`)
) TYPE=MyISAM;

CREATE TABLE `storeproductgenre` (
  `productgenreID` int(12) NOT NULL auto_increment,
  `productgenreName` varchar(50) NOT NULL default '',
  PRIMARY KEY (`productgenreID`)
) TYPE=MyISAM;
```

Figure 6.2: Create tables for database

The storeproduct table used to store all the information about the product items. The storeproductcategory allows grouping the products into relevant categories. The storeproductgenre allows grouping the products into relevant genres. The storecustomer table used to store the customer information. The storeorders table used to store the customer's order information.

After creating the database and its tables, coding for the prototype system is started by using PHP 4 Scripting Language that access to the Apache Web Server and connects to the database.

6.3 Database access

Having created the database, the connection and disconnection from the database need to be creating for database access. The code for connect to the database is stated in dbconnect.php as following:

dbconnect.php

```
<?
  $mysql_link = mysql_connect ("localhost", "root", "") or die ("<p>Could not connect to the database!");
  mysql_select_db ("vcd_dvd", $mysql_link) or die ("<p>Could not select the database!");
?>
```

The code for disconnect from the database is stated in dbdisconnect.php as following:

dbdisconnect.php

```
<?
  mysql_close($mysql_link);
?>
```

6.4 The site development

Having built the database access, the author proceeds to the site development to begin the design of the storefront with a way to present all the product offerings. The component of the store is modular, in the sense that the code for each function is contained in separate PHP files. The entire file is called upon in a master PHP file that controls which modules are processed. It is much easier to debug or make changes to any aspects of the program by lumping each operational component into a separate file.

To begin coding for the prototype, the author begins development with the index page for the site. All subsequent pages of the web site will look similar to this index page. The format shown in Figure 6.3 is used for the entire page.

At the top of the page, a banner is displayed; on the left-hand side, the customer product choice is displayed and the rest of the screen is used for customer interaction.

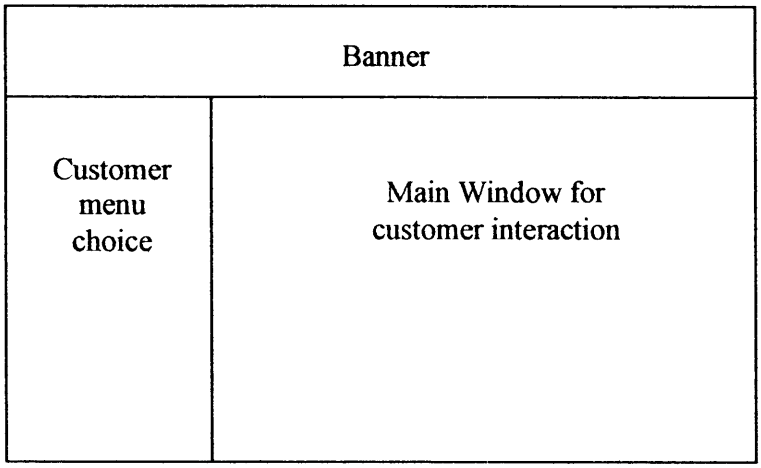

Figure 6.3: The web site format

The following is an example of the code to implement the prototype system. For the customer menu choice, the code to implement a way to list all the product categories is shown as following:

```
<?
include("./dbconnect.php");
$query = "select * from storeProductCategory order by productcategoryName";
$mysql_result = mysql_query($query, $mysql_link);
while($rows = mysql_fetch_row($mysql_result))
{
  printf("<a href=\"./index.php?categoryID=%s&categoryName=%s\">%s</a><br>", $rows[0], $rows[1], $rows[1]);
}
include("./dbdisconnect.php");
?>
```

Several programming codes are provided in the Appendix D.

6.5 Code testing

Testing need to be done during this phase before approve any code for production. During this phase, integration testing has been conducted to test the interaction of modules to assure that each of the modules is worked together. Thus, the code is tested module by module to make sure it runs with no errors to assure that the system works well as part of the overall system for the expected main functions. However, there was limitation in code testing for this prototype system. There has no additional code in place to check for errors in any of the inputs for adding and editing the system information.

6.6 Summary

This chapter focused on implementing the Web Based VCD/DVD Ordering System to start up web based system for the brick-and-mortar business that included the explanation of web store application architecture, setting up the database, coding and testing the prototype system. The next chapter will discuss the evaluation of the prototype system.

CHAPTER SEVEN

EVALUATION

This chapter evaluates the prototype system that has been developed for the project. The prototype system is being tested based on the usability testing to evaluate the customers' satisfaction. The usability testing is carried out at the end of the construction phase of the prototype system. Usability testing is used to test how easy and comfortable of the system is being used and accepted by the users.

7.1 Aim of the evaluation

The aim of the evaluation is to validate the usability of the prototype Web Based VCD/DVD Ordering System. Usability testing focuses on whether a user interface is easy to learn, satisfying to use and has the functionality that users want (Beranaghan, 1999). The level of satisfaction is used to observe the level of comfort and acceptance of the users for this prototype system. The true purpose of usability is to set the design direction, not to generate numbers for reports (Nielsen, 2001). Thus, the test result is used to help in the design of new versions.

7.2 Evaluation method

Nielsen (2000) research found that the prototype system needs to test with at least 15 users to discover all the usability problems in the design. Thus, the prototype of Web Based VCD/DVD Ordering System is being tested with 15 subjects, chosen based on having at least some Internet experience. The representative users were asked to complete a typical task and then answer the

given questionnaire. The following are the specific tasks that need to be completed by the subjects:

Task 1: Use the search engine to find specific movie product.
Task 2: Find out the specific product based on product category.
Task 3: Find out the specific product based on product genre.
Task 4: Create customer profile for ordering purpose.
Task 5: Check out to place order for the selected products.

A survey consists of 12 likert scale questionnaire were administered to a sample of customers from the case organization, Golden Star VCD Store (refer Appendix E). The Software Usability Measurement Inventory (SUMI) was serving as a guide for developing the questionnaire. SUMI was developed primarily as a summative instrument which measures a user's perception of the usability for software (Kirakowski & Corbett, 1993). According to Keinonen (1999), SUMI is a recognized method of testing user satisfaction by ISO 9241 which is aims at measuring the perceptions and feelings of a typical user. Satisfaction measured using a subjective ratings scale whereas the SUMI questionnaire at the end of the session, gives scores for each subject's perception of overall satisfaction, efficiency, affect, helpfulness, controllability and learnability. Hence, usability test should be conducted based on usability attributes: affect, control, efficiency, helpfulness and learnability (Keinonen, 1999).

Affect indicates how much the participant like the system, control indicates whether they felt in control, efficiency indicates how well the system supports the participant while working on the tasks, helpfulness indicates how far the system is self-explanatory or seem s to assists the participant and learnability is the participant's perception of ease of learning. Based on the answers given, the usability test scores were calculated in percentage. Erik and Veenandal (1988) stated that score has an average value of 50 in a normal distribution. This means that by definition for a value exceeding 50, the user satisfaction is higher than average.

7.3 Result analysis

Based on the respond for the questionnaires from the 15 subjects, the result are collected and analyzed based on each usability attribute and the overall satisfaction. The result of the usability testing score is shown in Table 7.1. The result analysis of each part is presented using graph in percentage value (refer Figure 7.1). Appendix F shows the result's details from the usability testing.

Table 7.1: Usability Test Score

Usability attribute	*Agree*	*Moderate*	*Not Agree*
Affect	80.00 %	16.67 %	3.33 %
Control	60.00 %	26.67 %	13.33 %
Efficiency	77.78 %	20.00 %	2.22 %
Helpfulness	76.67 %	20.00 %	3.33 %
Learnability	83.56 %	13.93 %	0.00 %
Overall Satisfaction	86.67 %	13.33 %	0.00 %

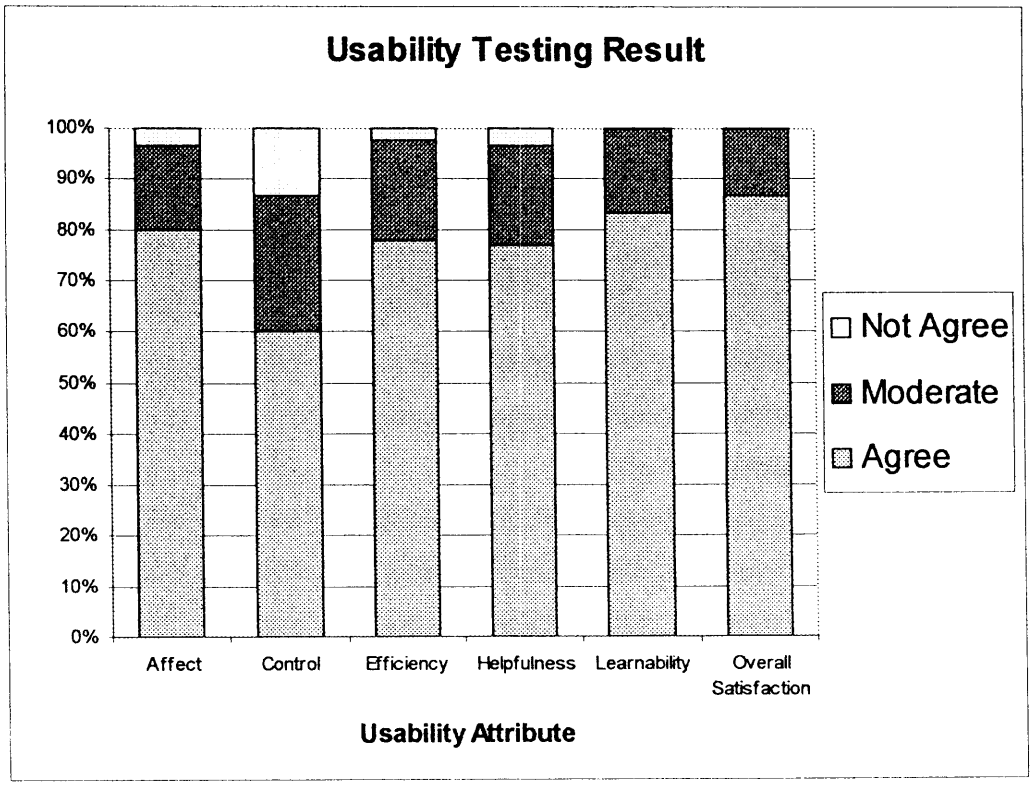

Figure 7.1: Usability Test Result

7.4 Evaluation

Based on the results, the conclusion has been made that the usability of the system is above 60% of marks given by the subjects. This shows that the prototype system has high capability in term of affect, control, efficiency, helpfulness and learnability. These figures indicated the subjects are more likely to use this system, felt in control when using the system, able to complete the tasks, the system is able to assist the participant and it is ease to learn. On the other hand, the usability attribute for control has the lowest percentage that is 60%, which means there are some design problems that should be considered in future development of the system. In overall, this system is highly satisfied by the subjects.

As a result, it is important for the web based ordering system to have the main functions to start up the web based application for Golden Star VCD Store and also other similar type of brick-and-mortar stores, which can let the customer browse and search the products easily and add to the shopping cart, then specify customer account for check out to place order.

7.5 Summary

The evaluation has been done by evaluate the usability for the prototype system by measured the level of user satisfaction in using the system. The subjects have been asked to perform some tasks as to answer the questionnaire. Overall, the subjects were satisfied with this prototype system and found that it is easy to use, felt comfortable when using it, and thus accepted overall functionality of this prototype system. The next chapter gives the suggestions to improve this prototype system.

CHAPTER EIGHT

CONCLUSION

This chapter reviews the overall progress of this project. It includes problems and limitations encountered during the development of this project, recommendations for enhancement to the current prototype system and recommendations for future research.

8.1 Project's summary

The existing brick-and-mortar stores have faced the problem of the great competition in the market despite its limited scope of sales. This competition has brought the review in businesses services that the customers preferable to go to the business which able to provide them with the better services. Thus, inefficiency of customers' services in the brick-and-mortar stores influenced the efficiency of the businesses.

The objective of this project is to build a prototype of Web Based VCD/DVD Ordering System for a start up purpose in the brick-and-mortar business based on the case organization. This system aims specifically in providing an alternative way to the customers to purchase a product through a web based application with the services that available for anytime and anywhere. Consequently, the brick-and-mortar business will able to expand their market globally and gain the competitive advantage through implementation of web based ordering.

Basically, this project followed the RUP methodology for the whole development process, which has covered three phases of RUP that consists of inception phase, elaboration phase and construction phase. UML is used as notation to analyze and design the prototype system.

At the end of the construction phase, evaluation has been conducted to evaluate the prototype system. This evaluation is carried out based on the usability testing that tested how usable the system is to meet the user needs. The evaluation result shown that users were satisfied with the system. Thus, the findings drawn from this study may be used to help in designing of new versions for the Web Based VCD/DVD Ordering System. Hence, some limitations encountered are being discussed and recommendations for enhancement were suggested.

Overall, this study has achieved the project's objective which is to build a prototype of Web Based VCD/DVD Ordering System that purposely produced for the start up version in the brick-and-mortar business. As a result, the customers are able to browse and search the products with the facility to preview the movie trailer and check the products availability, specify the account information, add products to the shopping cart or order list, then check out to place order.

Therefore, it is recommended for the brick-and-mortar stores to start up the web based ordering system to compete in the existing market and expand their accessibility to the market outside their geographical boundaries. Besides that, the web based ordering system also able to help promotes the products in wider range and increase the company image throughout the country. Moreover, customers are able to experience an alternative to purchase the home entertainment products such as movie VCD/DVD.

8.2 Problems and limitations

Since this project is a prototype system, there were some problems and limitations have been discovered. Due to time constrained, this prototype system is developed and tested within several limitations as following:

i. The present study had a restricted scope, which excludes the actual credit card processing.
ii. Error checking for code and input information is limited.
iii. The prototype system is implemented and tested on Microsoft Internet Explorer 6.0 browser.
iv. The system has been tested under Window platform.

In order to get this prototype function well in delivering its content to user community, some recommendations have been suggested.

8.3 Recommendations for enhancement

There are some suggestions of the recommendations for enhancement to the current prototype system. In order to overcome the limitations mentioned above, several suggestions are recommended as following:

i. The prototype system should cover larger scope to implement the actual credit card processing.
ii. Implement errors checking in any of the inputs for adding and editing the system information by using additional code.
iii. Run the application via web server using Secure Socket Layer (SSL) to improve security for web based ordering system.
iv. Develop and test the prototype system on the web using various browsers and platforms.
v. Provide customers the ability to edit the cart information.

8.4 Recommendations for future research

There is also having some suggestions of the recommendations for future research on this system. These suggestions include the following:

i. Add some additional or advanced features that can tailor to customers needs, such as advance search.
ii. Implement more payment options, such as money order or postal order and prepaid card produced by the company.
iii. Offering a gift registry or wish list features to encourage people to share URL with other.
iv. Provide product feedback and ratings to share feedback about product from the customer.

8.5 Summary

As an overall, this project has achieved the project objective, which is to build a web database ordering system model for brick-and-mortar store. Therefore, it is recommended for the brick-and-mortar stores to start up the web based ordering system. Several suggestions for the enhancement of this prototype system also have been recommended for the future development of this project.

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APPENDIX A

Sample of Interview Questions

Sample of Interview Questions with Store Owner

1. What is your vision you hope to achieve from your business?

2. Currently, how you operate your business?

3. Do you face any problem or limitations for the existing business?

4. How you solve the entire problem or have any suggestion to improve your business?

5. Are you familiar with word "Web Based"?

6. What are your opinions using web based system to provide an alternative for your customers in the current manual system?

7. If you have provided one web site to your customer to order the products through the web based system, what function you think should provide in that web site?

8. Do you have further comments? Did I miss anything important?

Sample of Interview Questions with Store Customer

1. Currently, how you buy the VCD/DVD?

2. Do you face any problem or limitations to purchase VCD/DVD in the existing store?

3. Do you have any suggestions for the store to improve their service?

4. Are you familiar with word "Web Based"?

5. What are your opinions using web based system to order the VCD/DVD?

6. Do you support if the store provides a web based alternative for you to order the VCD/DVD?

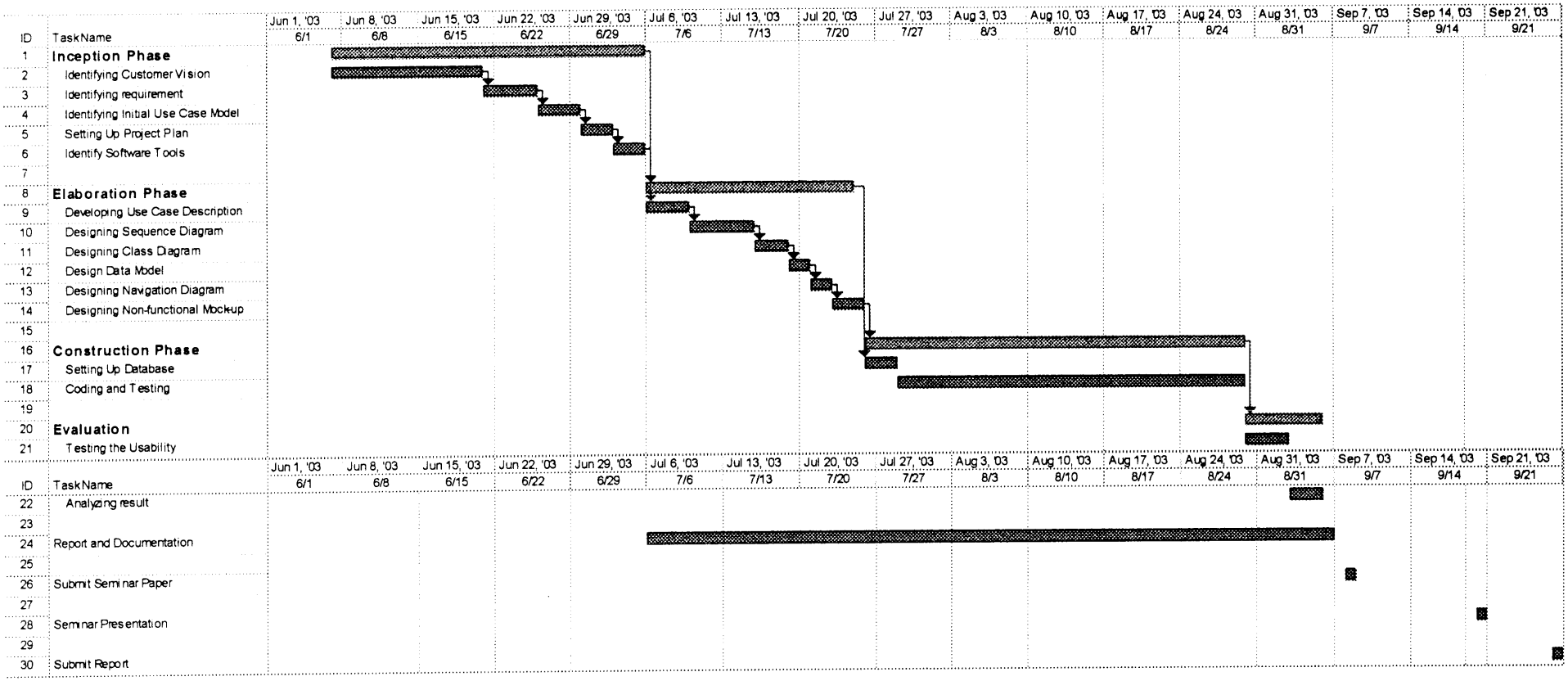
7. If the store provides a web based ordering system, what function you think should provide in that web site?

8. Do you have further comments? Did I miss anything important?

APPENDIX B

Gantt Chart

Gantt Chart for the Project Development of Web Based VCD/DVD Ordering System

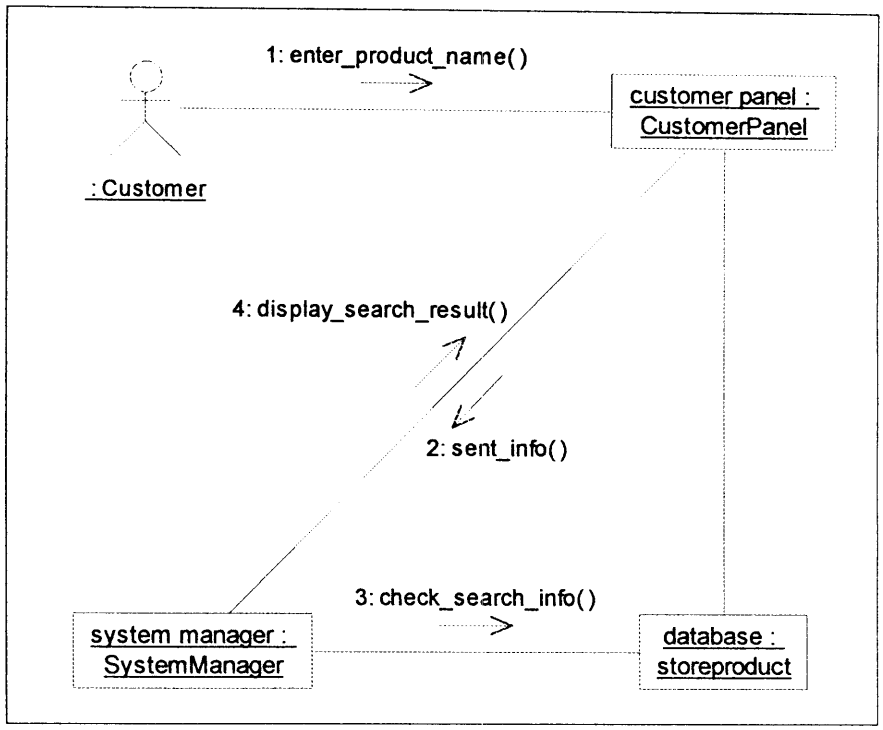


APPENDIX C

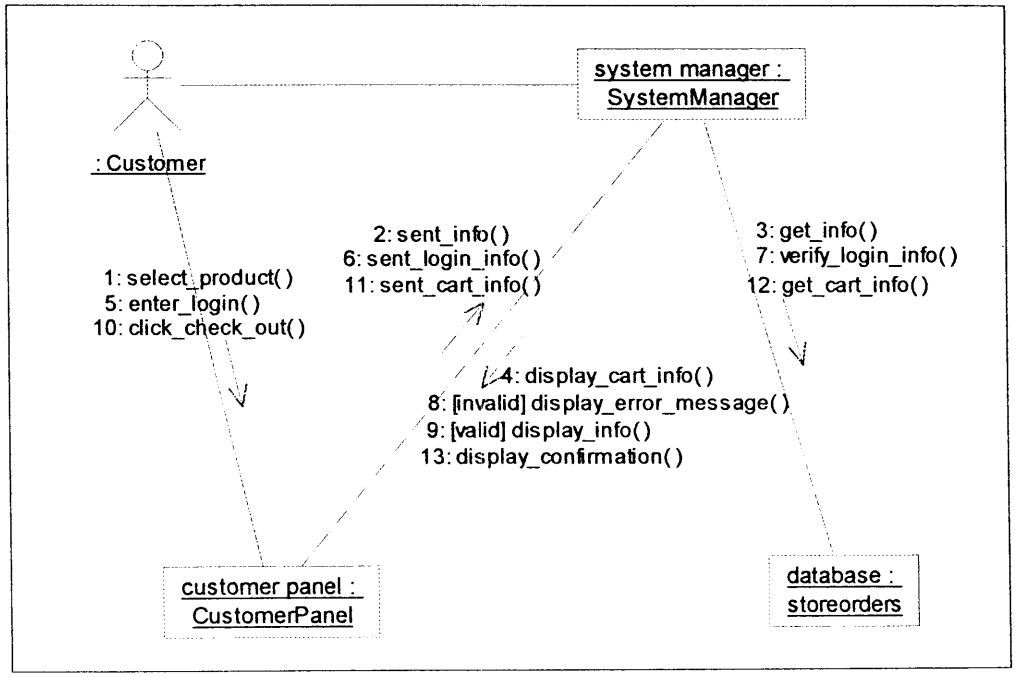
Examples of Collaboration Diagrams

The following are examples of the collaboration diagrams that have been transformed from the sequence diagrams.

1. Collaboration diagram to search product



2. Collaboration diagram to check out



APPENDIX D

Programming Codes

Some of the programming codes

// ProductList.php

```
<?
$query = "select * from storeProduct where storeProduct.productCategory =
'$categoryID' order by productName";
$mysql_result = mysql_query($query, $mysql_link);
printf("<h2><font color=\"#ff00ff\">Product Category: %s</font></h2>",
$categoryName);
print("<table width=\"500\" align=\"center\" border=\"0\" cellpadding=\"0\"
cellspacing=\"3\">");
print("<tr><td><b>Product</b></td><td align=\"center\"><b>Stock</b></td> <td
align=\"right\"><b>Price (RM)</b></td></tr>");
while($row = mysql_fetch_row($mysql_result))
{
print("<tr>\n");
printf("<td><a href=\"./index.php?categoryID=%s&categoryName=%s&
productID=%s\">%s</a></td>\n", $row[2], $categoryName, $row[0], $row[1]);
print("<td align=\"center\">");
if($row[6] <= 0)
{
print("Out of stock.");
}
else
{
print("In stock.");
}
print("</td>\n");
printf("<td align=\"right\">%s</td>\n", $row[5]);
print("</tr>");
}
print("</table>\n");
?>
```

// search.php

```
<?
printf("<FORM METHOD=POST
ACTION=\"./index.php?productName=$productName\">");
printf("<b>Search</b>:<INPUT TYPE=\"text\" NAME=\"productName\" SIZE=15>");
printf("<INPUT TYPE=\"submit\" VALUE=\"Go\">");
printf("</FORM>");
?>
```

// ProductView.php

```
<?
$query = "select * from storeProduct where storeProduct.productID =
'$productID'";
$mysql_result = mysql_query($query, $mysql_link);
while($row = mysql_fetch_row($mysql_result))
{
printf("<h2><font color=\"#ff00ff\">Product Category: %s</font></h2>",
$categoryName);
print("<table width=\"500\" align=\"center\" border=\"0\" cellpadding=\"0\"
cellspacing=\"3\">");
      print("<tr>\n");
      print("<td>\n");
      printf("<b>%s</b><br>", $row[1]);
      print("</td>\n");
      print("<td align=\"right\">\n");
```

```
      printf("<b>Price: RM %s</b>", $row[5]);
      print("</td>\n");
      print("</tr>\n");
      print("<tr>\n");
      print("<td valign=\"top\" colspan=\"2\">\n");
      printf("<img src=\"%s\" align=\"left\">", $row[4]);
      printf("%s", $row[3]);
      print("</td>\n");
      print("</tr>\n");
      print("<tr>\n");
      print("<td align=\"center\"> This item is currently\n");
      if($row[6] <= 0)
      {
       print("out of stock.");
       print("</td>\n");
       print("<td align=\"right\"> </td>\n");
      }
      else
      {
       print("in stock.");
       print("</td>\n");
       print("<td align=\"right\">\n");
       print("<form action=\"./index.php\" method=\"get\">");
       print("<input type=\"hidden\"name=\"shoppingCart\"value=\"Add
Cart\">");
          print("Qty. <input type=\"text\" name=\"qty\" value=\"1\"
size=\"4\" maxsize=\"10\"> ");
       print("<input type=\"submit\" name=\"submit\" value=\"Add to Shopping
Cart\">");
       print("<br><b>Make sure you have entered correct Quantity</b>");
       printf("<input type=\"hidden\" name=\"productID\" value=\"%s\">",
$row[0]);
       print("</form>");
       print("</td>\n");
      }
      print("</tr>\n");
if ($row[7]<>'')
{
     print("<tr>\n");
     print("<td colspan=2>\n");
 include("./showvcd.php");
     print("</td>\n");
     print("</tr>\n");
}
     print("</table\n");
}
?>
```

// showvcd.php

```
<?
printf("<BODY> ");
printf("<OBJECT id=MediaPlayer classid=CLSID:22D6F312-B0F6-11D0-94AB-
0080C74C7E95 ");
printf("width=335 height=300 type=application/x-oleobject ");
printf("STANDBY=\"Loading Windows Media Player components...\"><PARAM
NAME=\"FileName\" VALUE=\"$row[7]\"><PARAM NAME=\"loop\" VALUE=\"true\"> ");
printf("<EMBED TYPE=\"application/x-mplayer2\" SRC=\"$row[7]\" ");
printf("WIDTH=\"335\" HEIGHT=\"174\" AUTOSTART=\"true\" LOOP=\"true\">
</EMBED> ");
printf("</OBJECT> ");
printf("</BODY> ");
?>
```

// Login.php

```
<?
$loginPage = "./index.php?shoppingCart=Login";
if (!isset($PHP_AUTH_USER) || $unauthorized)
{
   $realm = "Golden Star VCD Store_".time();
   Header("WWW-Authenticate: Basic realm=\"$realm\"");
   Header("Status: HTTP/1.0 401 Unauthorized");
   print "<h1>Unable to authorize you.</h1>Please <a
href=\"./index.php?\">click here</a> to go back to Home Page.";
   exit;
}
else{
   include("./dbconnect.php");
   $query = "select * from storeCustomer where customerUserID =
'$PHP_AUTH_USER' and customerPassword = '$PHP_AUTH_PW'";
   $mysql_result = mysql_query($query, $mysql_link);
if(mysql_affected_rows() == 0)
   {
      header("Location: ".$loginPage."&unauthorized=1");
         exit();
   }
   else{
      while($row = mysql_fetch_row($mysql_result))
      {
         $custID = $row[0];
       }
   }
   include("./dbdisconnect.php");
}
?>
```

// CartView.php

```
<?
print("<p><b>My Shopping Cart</b><br>\n");
include("./dbconnect.php");
$orderTotal = 0;
print("<p><b>Order Information:</b>");
$query = "select * from storeOrders, storeProduct where orderCustomerID =
'$custID' and orderStatus = 'Pending' and orderProductID = productID";
$mysql_result = mysql_query($query, $mysql_link);
print("<table width=\"500\" border=\"1\" cellpadding=\"3\">\n");
print("<tr><td width=\"45%\"><b>Product Name</b></td><td align=\"center\"
width =\"12%\"><b>Price(RM)</b></td><td align=\"center\"width=\"11%\"><b>
Quantity</b></td><td
align=\"center\"width=\"12%\"><b>Total(RM)/b></td></tr>\n");
while($row = mysql_fetch_row($mysql_result))
{
   $itemSubTotal = ($row[11] * $row[5]);
   $itemSubTotal = number_format($itemSubTotal, 2, '.', '');
   $orderTotal = ($orderTotal + $itemSubTotal);
   $orderTotal = number_format($orderTotal, 2, '.', '');
print("<tr>\n");
printf("<td>%s</td><td align=\"right\">%s</td><td align=\"center\">%s</td>
<td align=\"right\">%s</td>", $row[7], $row[11], $row[5], $itemSubTotal);
print("</tr>\n");
}
printf("<tr><td colspan=\"3\" align=\"right\"><b>Total Price :
RM</b></td><td align=\"right\">%s</td></tr>", $orderTotal);
print("</table>\n");
include("./dbdisconnect.php");
?>
```

// CartCheckOut.php

```
<?
print("<b>Checking Out...</b><br>\n");
include("./dbconnect.php");
$query = "update storeOrders set orderStatus = 'Open' where orderCustomerID
= '$custID' and orderStatus = 'Pending'";
$mysql_result = mysql_query($query, $mysql_link);
print("<b>You Order is now being processed. You should received it
shortly.</b><br>\n");
print("<p><b>Thank you for placing the order with us. We hope that you
enjoyed shopping with us.</b><br>\n");
include("./dbdisconnect.php");
?>
```

APPENDIX E

Sample of Questionnaire

Questionnaire filled up by VCD store customers

This is an evaluation form for Web Based VCD/DVD Ordering System that you will try out. This system (web site) is purposely used for order the VCD/DVD movie products.

Please perform the following tasks, and then answer the questions below to find out whether it could meet your needs.

Task 1: Use search engine to find specific movie (The Lord of the Ring III)
Task 2: Find out specific movie based on category (VCD: The Sinbad)
Task 3: Find out specific movie based on VCD genre (Action: Project A)
Task 4: Create customer profile for ordering purpose
Task 5: Check out to place order for specific products (for 3 items above)

Note: Please place a check mark (✓) for your choice of opinion regarding how easy and convenient the system is to use.

No.	Statements	Agree	Moderate	Not Agree
1	I enjoy using this system.			
2	I like the displaying screen (interface) of this system.			
3	I know what to do next with this system.			
4	I do not feel in command of this system when I am shopping with it.			
5	It is easy to find the product (movie VCD/DVD) information.			
6	It is easy to create the customer profile.			
7	It is easy to complete my order or check out.			
8	The information displayed (interface) is clear.			
9	"How To Order" helps me to complete the ordering process.			
10	This ordering system is easy.			
11	It does not take too long to understand the system function.			
12	Overall, I am satisfied with this ordering system.			

Comments:

Thank you for your respond to these items.

APPENDIX F

Result of Questionnaire

Result of questionnaire

The statements divided into different usability attributes as the following:

Statement	*Usability Attribute*
1, 2	Affect
3, 4	Control
5, 6, 7	Efficiency
8, 9	Helpfulness
10, 11	Learnability
12	Overall Satisfaction

The result of questionnaire based on usability test is as following:

Statement No.	Agree			Moderate			Not Agree		
	No. of subjects	Subject/ total	%	No. of subjects	Subject/ total	%	No. of subjects	Subject/ total	%
1	12	24/30	80.00	2	5/30	16.67	1	1/30	3.33
2	12			3			0		
3	11	18/30	60.00	3	8/30	26.67	1	4/30	13.33
4	7			5			3		
5	14	35/45	77.78	1	9/45	20.00	0	1/45	2.22
6	11			4			0		
7	10			4			1		
8	10	23/30	76.67	4	6/30	20.00	1	1/30	3.33
9	13			2			0		
10	15	25/30	83.33	0	5/30	16.67	0	0/30	0.00
11	10			4			1		
12	13	13/15	86.67	2	2/15	13.33	0	0/15	0.00

APPENDIX G

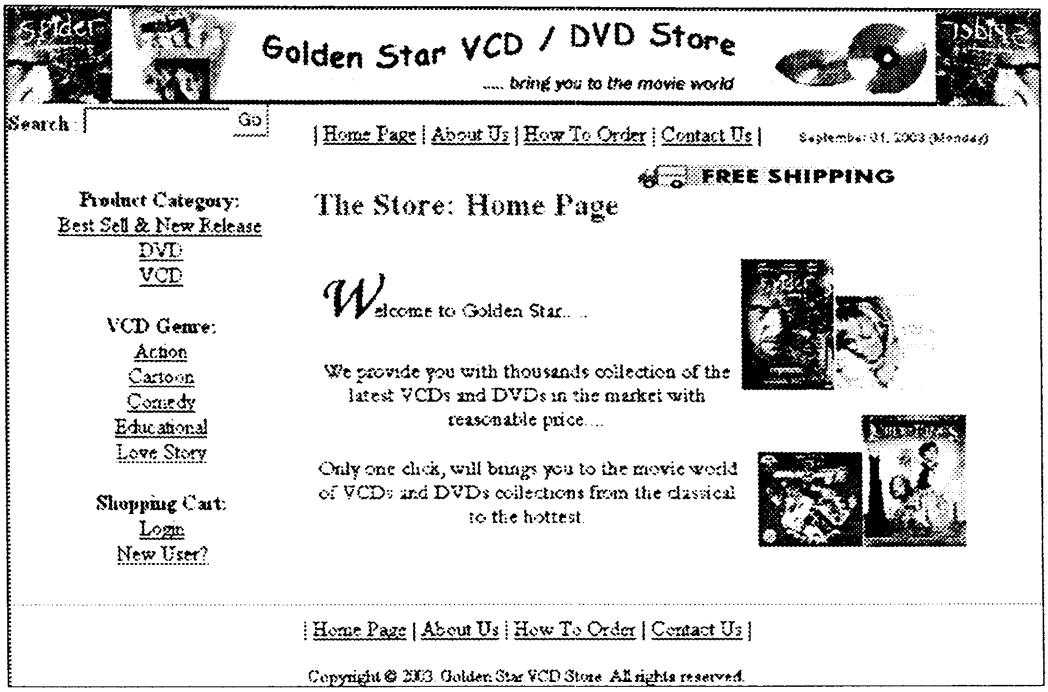
User Manual

Introduction

Web Based VCD/DVD Ordering System is one type of e-commerce system that categorized as business-to-consumer (B2C) e-commerce. This system refers to an online ordering processing engine where customer can place order for VCD/DVD movie products via the web site.

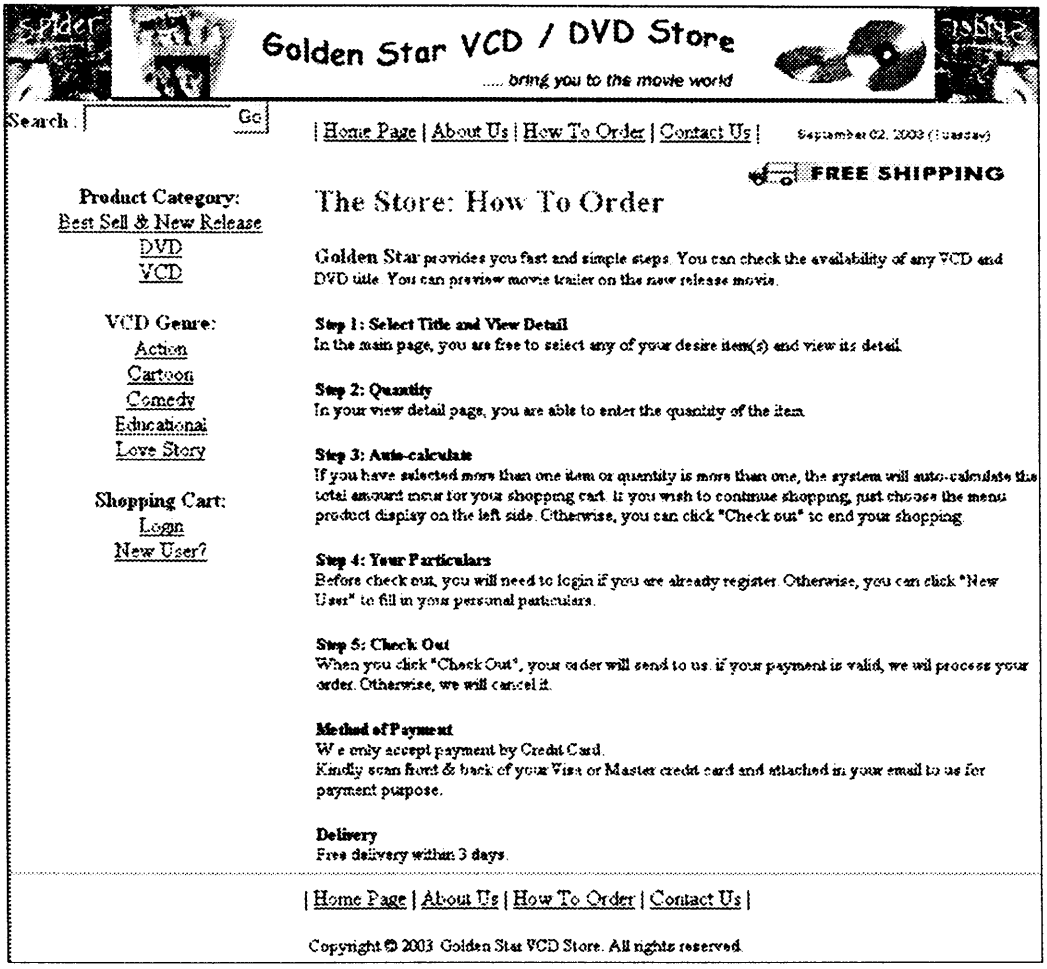
This user manual provides explanation of features for each system slide to guide you when using this system. The following slide shows you the main page of the system.

1. Main page



The main page displays the home page of the system. From the main page, you can get the information of the product category list and VCD genre list, search column, login or new user and other general information related to the store such as about us, contact us and how to order.

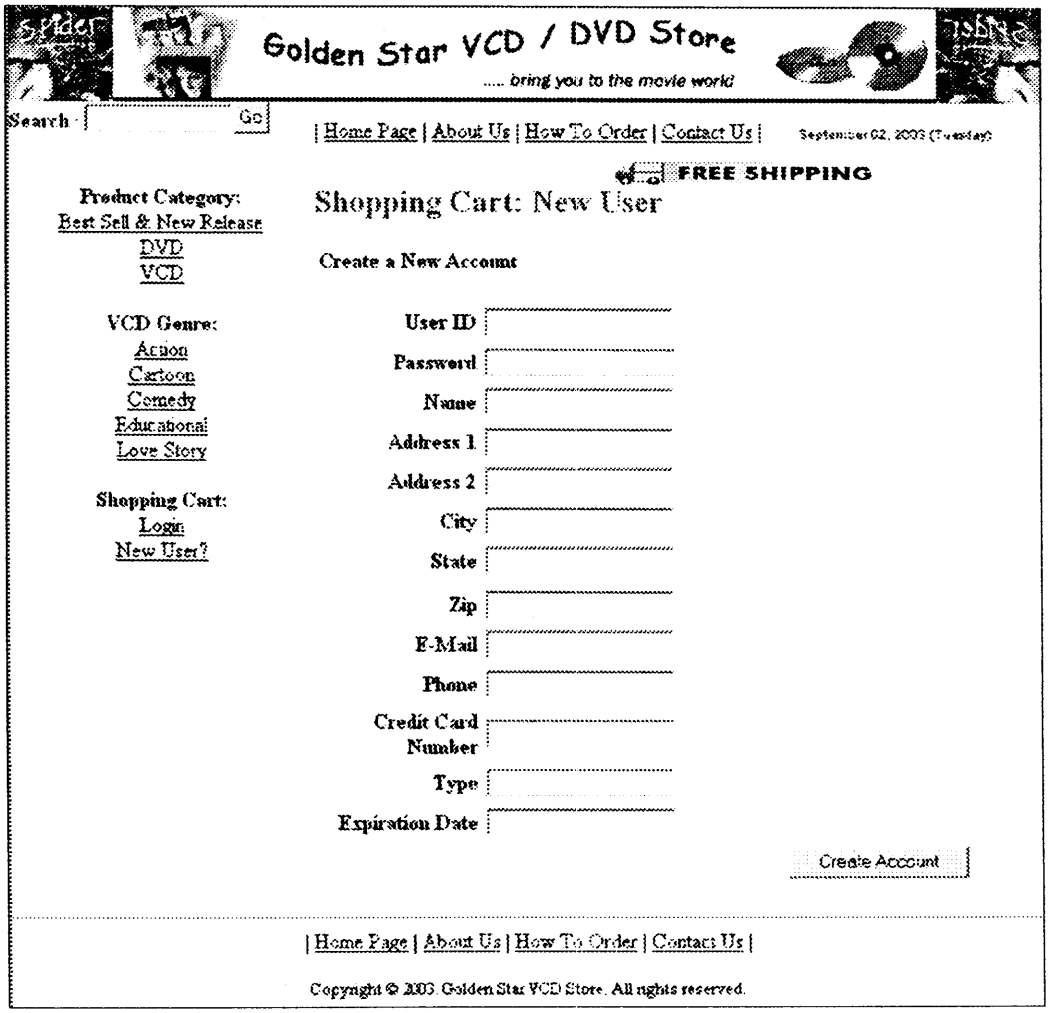
2. How To Order



This slide gives some description for how to order by using this system. The displayed screen provides step by step guidance to order the VCD/DVD movie products.

3. Login / New User?

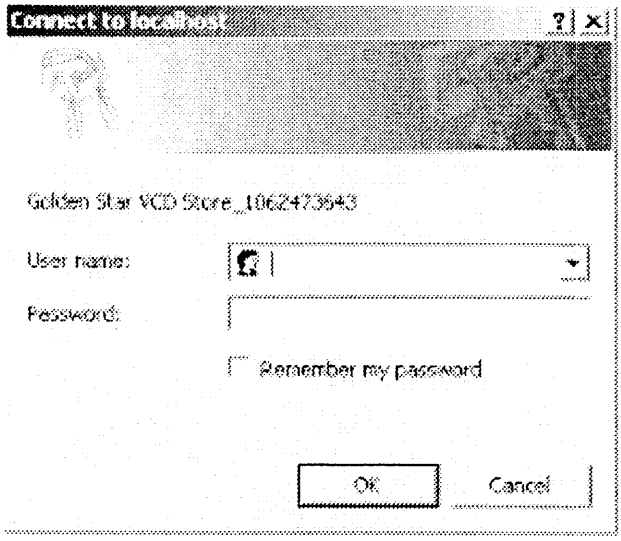
From the main page, there are options for login or new user. If you are a new user, please click on New User? to create a customer profile. The "Create a New Account" form will be displayed on the screen as following:



This screen shows the form that you need to key in your personal detail, address and contact information and the credit card details to create an account for the Web Based VCD/DVD Ordering System.

Then, please click the button [Create Account] at the bottom of the page to submit the information you have keyed in.

After create an account, you can login to the system by clicking on Login. The following pop up menu will appear.

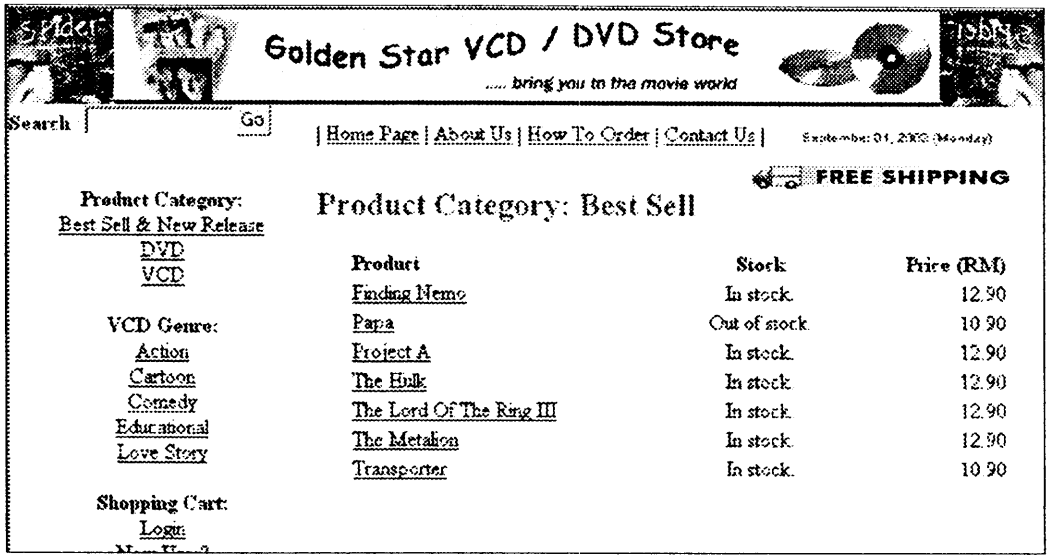


You need to enter your user name and password you already registered to the system and then click OK button. If you have entered the correct information, the system will direct you for more options such as My Cart, My Account and Check Out; otherwise, the invalid login page will display and re-direct you to login again.

4. Menu options: Browse product list

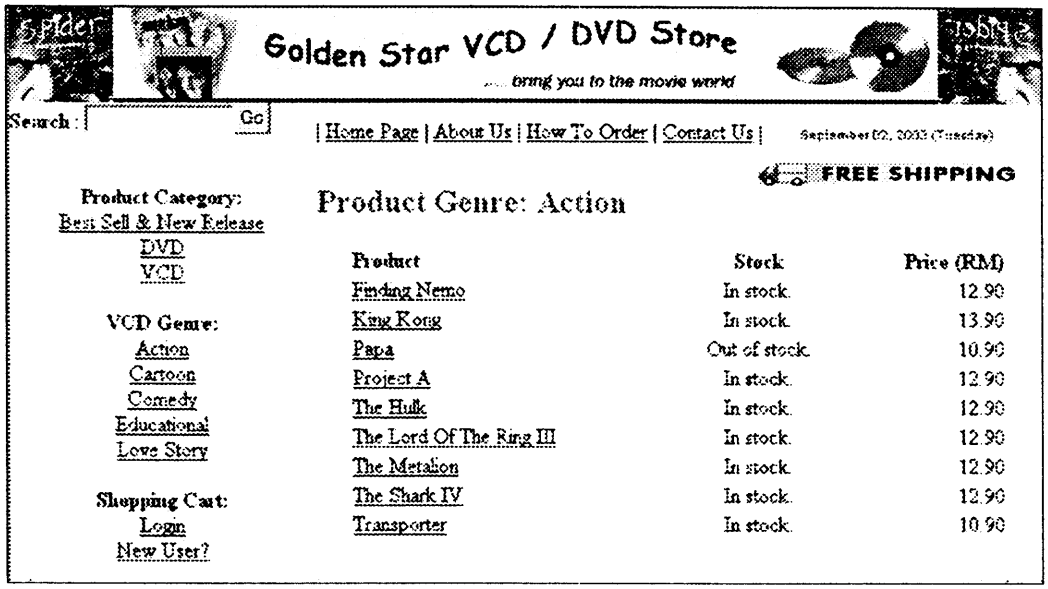
From the displayed screen, you have two options to browse the product list, which are by product category or by VCD genre.

a. Browse product list by product category



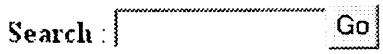
By clicking on any product category options, the screen will display the product category list for the category that you have entered. The screen will present the product title, stock availability (in stock or out of stock) and the price of each product.

b. Browse product list by VCD genre



By clicking on any VCD genre options, the screen will display the VCD genre list for the genre that you have entered. The screen will present the product title, stock availability (in stock or out of stock) and the price of each product.

5. Search product

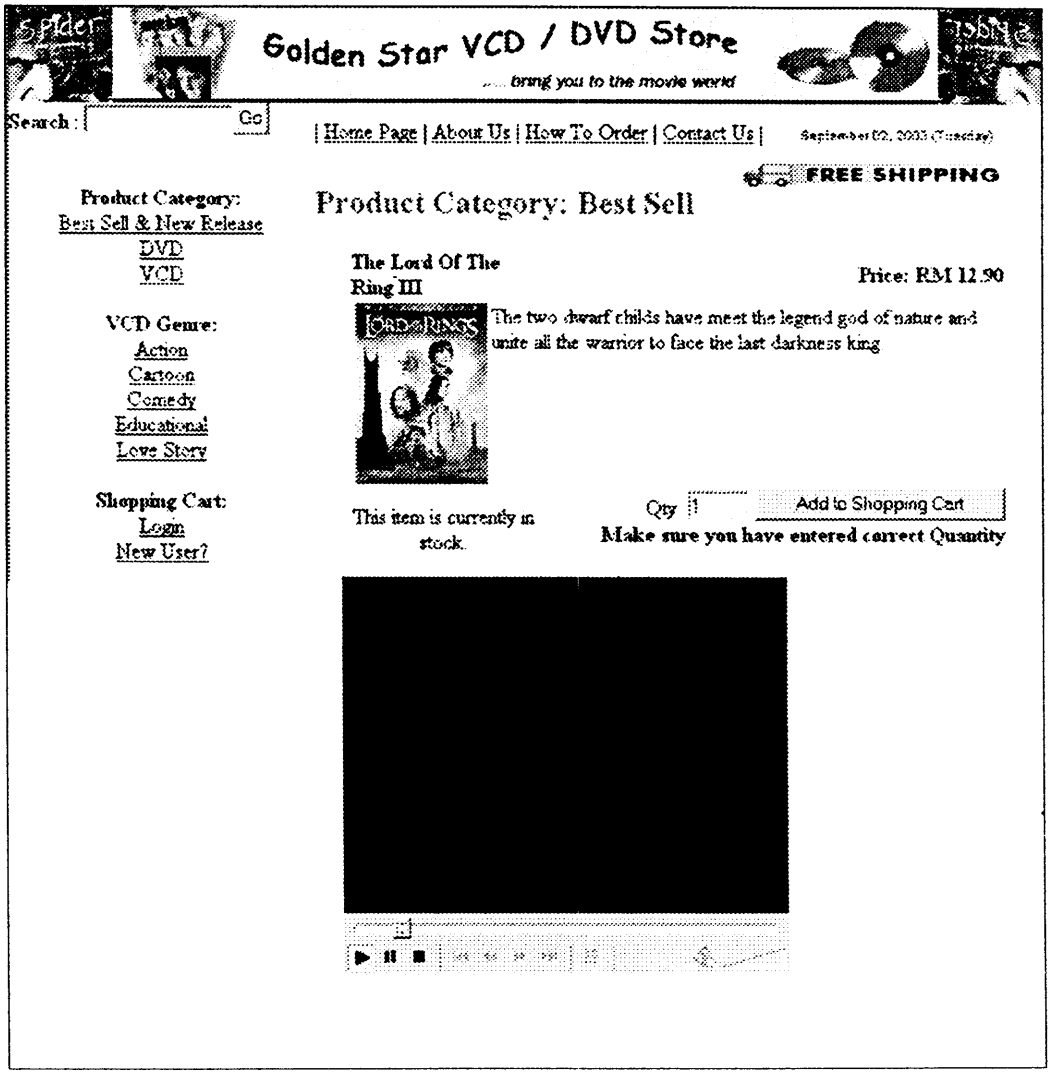


If you would like to search an item, type in the keyword of the item's title in the field provided and then clicks the 

button. The screen will displays the search result for any item's title that contains similar word, for example:

Example of keyword entered	*Search result for item's title*
ring	The Lord of the Ring III The Midnight Ringing

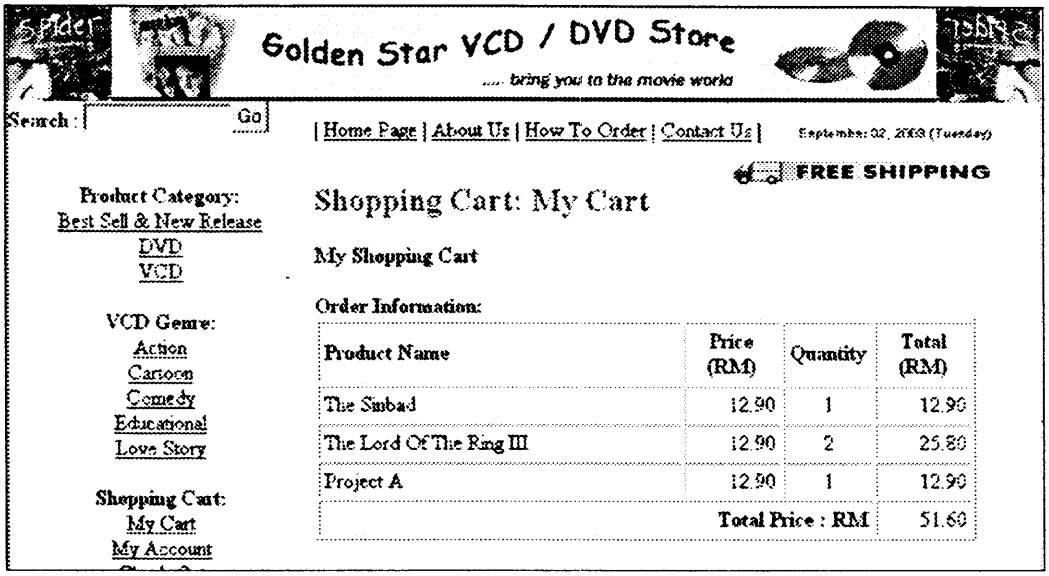
6. Browse product detail



By clicking any item from the product list, the system will displayed each item detail that contains the information of item image, item description and movie preview.

If the item is in stock, you can go further to add the item to the shopping cart by specifying the quantity that you want to order. After you have entered the correct quantity, please click on Add to Shopping Cart button.

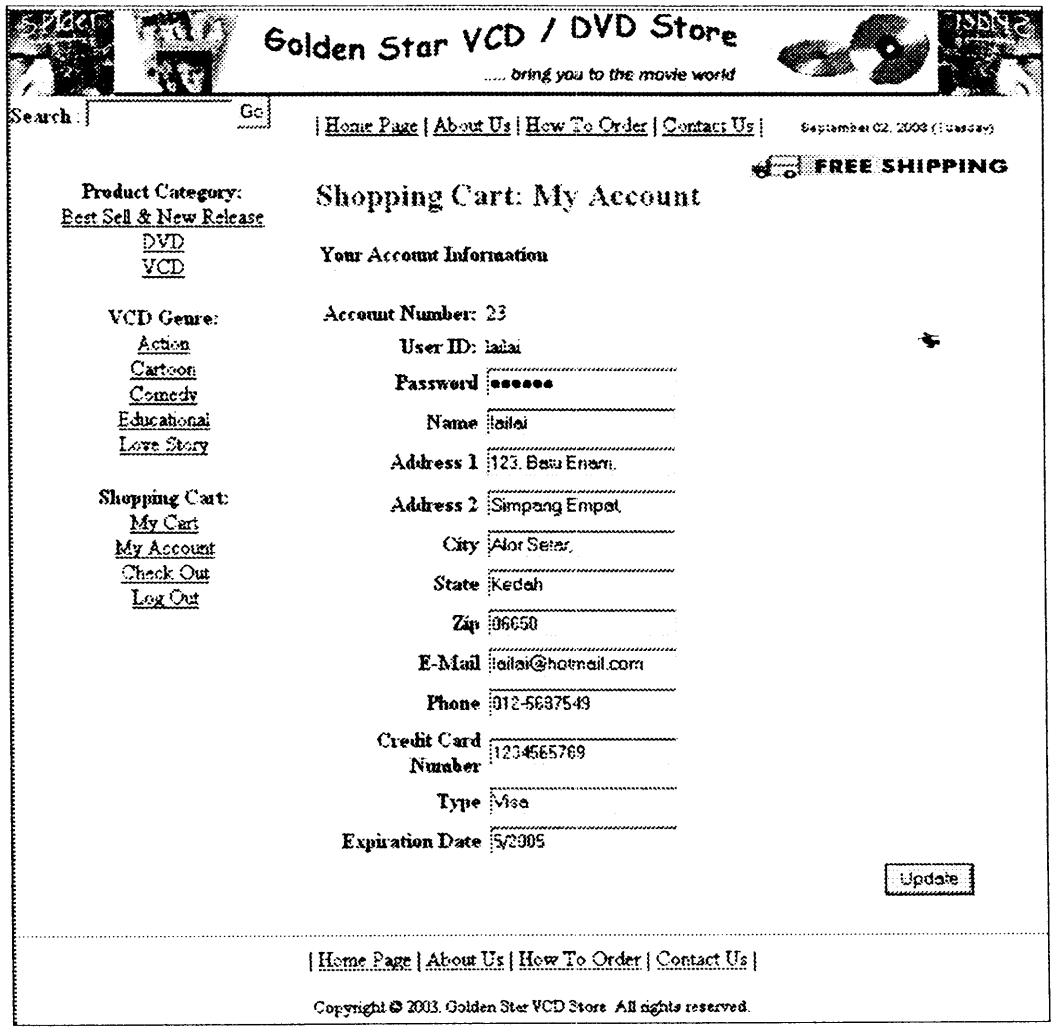
7. View shopping cart



You can view your shopping cart information by clicking on My Cart. The screen will displayed your cart information that shows the product name, price per item, quantity, auto-calculate of total for each item(s) and auto-calculate total price for all the items.

8. Update customer account information

You may update your account information once you already login in to the system by clicking on My Account. The following screen will display.



After editing the information, click the Update button. Then, the message for updating account is displayed.

9. Check out

Once you have finished selecting the product to order, you may click on Check Out to place your order. The following screen will display.

The displayed screen informs you that your order is being process and express thank you to your order.