

Chapter 1

Introduction

1.1 Background

Over the last two decades, the term “e-commerce” has grabbed the headlines throughout the world, and has been the subject of intense debate. Electronic commerce, know as e-commerce, is the cutting edge for today’s business, so companies became compelled to adopt e-commerce in order to survive (Dixon, 2002).

In the retail property market, which is facing severe pressure and changes due to the nature of competition, companies are now trying to have their own unique purchasing system to achieve competitive advantage in the market. Online purchasing systems have become more and more popular, and more consumers are using the internet to purchase on-line.

There are two types of organizational structures for retail chain stores, i.e. a centralized organization and a decentralized organization. A centralized organization is defined as one in which store practices are mandated from

corporate headquarters (HQ) or head offices, and the manager of the HQ manages and makes the decisions for the stores. A decentralized organization gives the freedom to the store managers to make the decision for their stores.

This research describes an online decision support system for retail chain stores (ODSS-RCS) that provides empowerment to related stores with the delivery of its customers' orders'. ODSS-RCS serves retail chain stores that have many head offices whereby each head office (HO) has many stores that are related to it as shown in figure 1.1. The head office and its stores may be available in a country, in a state or in a city, and so on. A head office and its stores are independent in terms of its administration, and distribution customers' orders from other head offices and their stores.

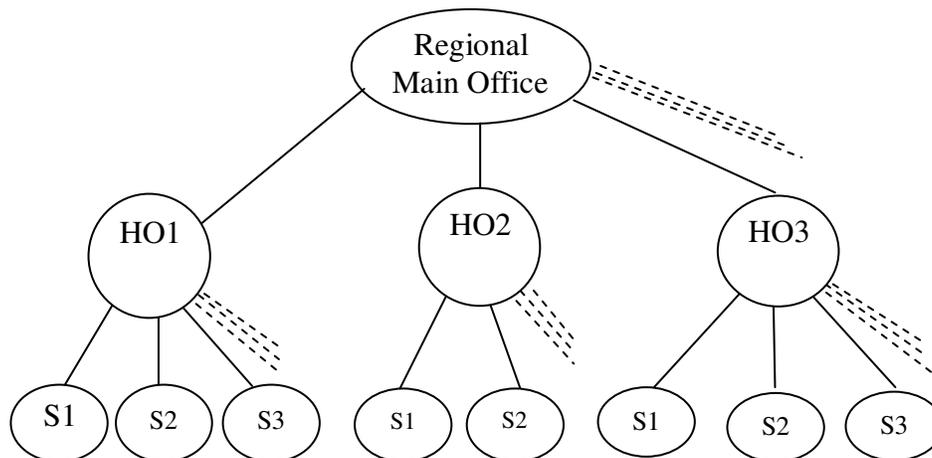


Figure 1.1: Structure of retail chain stores that is supported by ODDS-RCS

The system can help a head office manager and a store manager to generate ad-hoc reports to help them in decision making. A store manager can make a decision depending on the reports generated that are related to the situation and information in his/her store. A Head Office manager can generate reports for the head office itself and also for its stores, but the head office manager can not generate reports for other head offices and their stores, therefore, this system allows the possibility for an organization to implement the concept of a decentralized retail chain store by giving the store managers the responsibility of making decisions which are suitable to their own stores.

The main improvement feature in ODSS-RCS is the ability of the system to make decision on which store should serve a customer. The system is able to find a near subset stores for a customer, based on the customer's postal/zip code input in the order form. Depending on the lowest cost of delivery, the system makes a decision as to which store should deliver the online customer's order. In addition to this, if the selected store does not have a product in the order, the system makes a decision to determine another store which can deliver the order to the customer based on the next lowest cost of order delivery.

The system will only search for another store within the same area of the identified head office and its stores, because in the real world, a head office and its stores may be in one country, state or area. If the product isn't available in these selected stores, the responsibility now lies with the store managers or the head office

manager to overcome this problem by ordering from the supplier. Here, the system also allows the managers to find the nearest suppliers that can supply the required products to the required stores.

1.2 Problem Statement

Currently, there are two types of on-line system provided by retail chain store companies; the first is where a customer selects the on-line store that he/she wants to purchase from, and the second where the system automatically finds the store for the customer based on his/her postal code. Both systems do not take into consideration the cost of delivery. But in reality, customers often care about cost the most as they are ones that are saddled with it. Therefore, a system is needed whereby both the needs of customers and the retail chain store companies are taken into consideration. The system can automatically find the nearest store to a customer that can satisfy the customer's order based on the lowest cost of delivery. The system can also be used to aid the managers in managing their respective stores and in making decisions related to the stores. This research seeks to investigate and develop such system.

1.3 Importance of the study

One of the important issues that have always been taken into consideration by the managers of retail chain stores is how to minimize the cost of delivery of the customers' orders, in order to increase the margin of profit and to get a competitive advantage. So, this research will investigate how the on-line system can help the retail chain stores to decrease the cost of delivery by finding the stores that can deliver the customers orders with the lowest cost of delivery.

Another important issue for retail chain store is customer satisfaction which should be pursued with both caution and determination. If customer is not satisfied with the way of purchasing from the online system, this causes negative impact on on-line retail chain stores. This research investigates how customers can conveniently purchase on-line.

Most of the online retail chain stores try to distribute orders all over the world, therefore a chain store has a huge number of stores and customer orders. Since managers face some problems in managing these stores, one of the important issues of this research is to develop an on-line decision support system for retail chain stores to help the organization in managing customers' orders and to apply the concept of decentralization in decision making.

1.4 Research objectives

The objective of this research is to investigate and build an online decision support system for retail chain stores in order to aid management in decision-making pertaining to customers' orders, sales, procurement of retail products, and inventory management in each stores. In achieving this objective, the research should achieve several goals as follow:-

- 1) Investigate current on-line retail chain stores, both locally and abroad, to identify the main problems limitation with current system.
- 2) Provide a solution to the identified problems and limitations of current on-line retail chain stores.
- 3) Build an online decision support system for retail chain stores that supports decentralized organizational structure, and can generate reports that can help a HO, and store manager in making decisions relating to his/her store that related to him/her store. The system:-
 - ⇒ Can support a series of head offices, with each HO supporting a series of stores that belong to it.

- ⇒ Can find a near subset of stores nearest to the customer, and then from the subset of stores, find the store which can deliver the customer's order depending on the lowest cost of delivery.
 - ⇒ Can find another store nearest to the customer in the case when the selected store does not carry a product in the customer's order. Here, the system with the lowest cost of delivery is chosen.
 - ⇒ Can provide an alternative to customers to purchase products on-line in a convenient way to increase customers' satisfaction.
 - ⇒ Can manage the product inventory for each store and determine which supplier can supply what product for a particular store.
- 4) Perform testing, including user acceptance testing, to ensure that the system performs each functionality accurately and efficiently.

1.5 Research Scope

The foundation of this research is to develop an online decision support system which helps retail chain stores to deliver online customers' orders from the near store to the customer and depending on the lowest delivery cost

The system manages a series of head offices and its stores. It also considers a head office to be a store that delivers online orders to customers. A manager of a head office can generate reports that support his/her decision making and manages the head office and its stores. But a manager of a store can generate reports and making decision pertaining to his/her store only. This means that the on-line system built applies the concept of decentralized retail chain stores.

1.6 Research methodology

Several approaches are implemented in this research in order to determine the requirements of the system. The strategy to achieve the project's goal involves the following steps:

1. Conduct Literature Review

Studied and analyzed, journals related to e-commerce, and decision support system, in addition, to articles related to online decision support system for retail chain stores.

2. Data Gathering and Analysis

In addition to conducting literature review, two questionnaires i.e. one for customers and the other for organizations that have many stores, were carried out. The data from these two surveys were gathered and analyzed in order to aid in coming up with proposed solution to the problems and limitations of current online retail chain stores.

3. System Development

Evolutionary Prototyping was used as the methodology for system development, due to time and requirements factors. The system development life cycle involved the following steps:-

⇒ Capture System Requirements

UML use case diagram was used to capture and identify the requirements of the system.

⇒ Design

The overall system design, structured design and database design were developed to be used later in the implementation phase.

⇒ **System Implementation and Testing**

System implementation translates the design into a computer system. Using ASP as the programming language, interacting with SQL server 2000 to build the database used in the on-line system.

⇒ **System Testing and User Evolutionary**

Testing is performed to validate the implementation and to test if the requirements captured meet the purpose of this research. This is done by showing if the components built comply with requirements specification and design. Then, the system is put to the test using a sample of organizations and customers to evaluate it.

1.7 Research Contribution

The main contribution of this research is in providing an online decision support system for retail chain stores to help managers in decision making and to deliver online orders to customers at the lowest cost. It takes into cost of delivery when determining which store should handle a customer order.

1.8 Outline of the Thesis

This research is organized in the following.

Chapter One gives a background on the research, problem statement, research objective, research scope, research methodology, research contribution and thesis organization.

Chapter Two outlines the definition of e-commerce and studies the type of e-commerce, and gives an analysis on the concept of online purchasing, type of decision support systems, web technologies and decision support systems, relation between online purchasing and decision support systems. This study reviews some related systems to an online decision support system for retail chain stores, describes main properties of these system. This chapter provides the findings of related systems, and provides some requirement which should be in online decision support system for retail chain stores.

Chapter Three is divided into two parts. The first contains the research methodology which describes the approaches that conduct this thesis as research questions, methodology and technique that is used in the research.

The second part describes the system development life cycle that is used in this thesis to develop an online decision support system for retail chain stores.

Chapter Four Contains analysis of questionnaires, and defines system's functional and nonfunctional requirements and makes the use case diagram.

Chapter Five has general models for ODSS-RCS, and how ODSS-RCS finds the near store, and description on the organization structure of retail chain stores that is supported by this research. This chapter further describes the database design and system architecture.

Chapter Six discusses the system development and implementation details. Some security issues are mentioned in this chapter.

Chapter Seven discusses the system testing in the system development life cycle of the system, and presents system testing for each function and overall system testing.

Chapter Eight presents the conclusion for the thesis.

Chapter 1: Introduction

1.1 Background 1

1.2 Problem Statement 4

1.3 Importance of the study 5

1.4 Research objectives 6

1.5 Research Scope 8

1.6 Research methodology 8

1.7 Research Contribution 10

1.8 Outline of the Thesis 11

Figure 1.1: Structure of retail chain stores that is supported by ODDS-RCS2