CHAPTER I

INTRODUCTION

1.1 Background Study

The company will meet customer requirements and also minimise the cost if the company has applied a good logistics management. The logistics management not only focuses on the warehouse but also concerns with other functions, they are customer service, order processing, communications of distribution, demand forecasting, traffic and transportation, plant and site selection of warehouse, material handling, procurement, parts and service support, packaging, salvage and scrap disposal, and handling of return goods [Lambert and Stock, 1992].

Generally, there are many types of goods in a warehouse such as raw materials, finished goods, accessories, component parts, packaging materials and many more. They have to be managed to acquire the lowest cost and easiest to access. In addition, the information of each item must be updated and can be accessed at anytime to assist in the production planning.

In most factories, materials are transported into or out of the warehouse. Most of the movements do not add any values to the products [Ballou, 1992]. The Logistics management can be used to optimise the movement and manage the storage location of items. Therefore, the optimum picking route in a warehouse is obtained for workers to move these items to the required place. In addition, the products can be delivered to the customers on time and the transportation cost of the company is reduced.

For our selected company, the raw materials are delivered and checked before moving into warehouse. The raw materials can be classified into two groups; those

imported and domestic materials. Each rack in this warehouse contains 3 to 5 stories of shelves. Heavyweight materials are stored at a lower shelf than lightweight materials. Picking materials and filling them onto shelves take place everyday. The workers have to pick and fill materials using their experiences in planning their tours.

The general practice in this factory is that when other departments request certain materials, the warehouse operator sends them by folk-lifts, hand lifts or trolleys, depending on the weight of materials. Each functional department has its own space to store the Work In Process (WIP) and the finished goods from the process, which is supplied to the next department for the next process. Finally, the finished products are delivered to the customers.

The finished products are shipped to the customers either by trucks or small trucks. However, extra subcontracted trucks are occasionally used. They are only required when the company's trucks are full in capacity. Drivers decide their routing to customers from their experiences. If they have to deliver to many customers at the same time, they may not achieve the optimal routing.

1.2 Problems Description

In the warehouse, there are many materials which have to be moved into or out of the warehouse. Materials are stored in specific places that are classified by the model of items. They do not concern about the frequency in picking and filling. As a result, some frequently demanded parts are located far from the receiving/shipping area. Furthermore, the workers pick the materials using their past experiences. This material handling cost cannot be minimised because the picking travel distance is not optimal. Storing materials at the right place retains their quality to the maximum. In addition, this helps in reducing the movement in picking the materials.

In transport, there are many routes to travel to each customer. Each highway is different, and has its own constraints. The company does not determine the transportation cost for each route. Therefore, the existing route of transportation to customer may not be optimised. In addition, the transportation schedule is planned from the past experiences of some personnels. Furthermore, the company has to manage some restrictions as follows:

1. The trucks are entitled to pay fee in some routes, such as the Motorway and the Bangna-Bangprakong express way.
2. The costomers have conditions of delivery acceptance.
3. Capacity limit for each truck.
4. Some routes are not suitable for heavy trucks, such as too narrow roads.

1.3 Objectives of the Research

To improve the material handling routing in the warehouse and transportation operation in an automotive part industry.

1.4 Scope and Limitations

The work on this thesis concentrates on the warehouse and delivery department. Nearest Neighbor Heuristic technique is utilised for the decision making for the proposal route. The proposed layout for the warehouse bases on the frequency in picking items and their models. The other scopes and limitations are as follows:

The inventory control is not included in this study. The company does not allow the name of suppliers, customers and part numbers to be disclosed. An evaluation of the proposed layout and material handling routing is determined from the travel distance in order picking and shelf-filling processes.

1. Each order is completed in one tour for item that ordered from the assembly department.

2. Picking vehicles start from the dock and return back to the dock.
3. The capacity of each vehicle is assumed to be enough in every tour.
4. Each item is located in specific places in the warehouse.
5. A picking cost is independent of the quantity of ordered items.

1.5 Research Procedures

1. Study the related literatures and techniques in a warehouse and transportation problems.
2. Determine the problems and collect information in the company.
3. Analyse information and apply some proposed techniques in the warehouse and transportation department.
4. Develop the new systems in the company.
5. Test the new systems.
6. Summarise the improvements and further developments.
7. Write up the thesis and submit the thesis form.
8. Prepare the presentation and final examination.

Table 1.1 : Research Schedule.

Procedures	1999										
	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. Study related literature	■	■	■	■	■	■	■	■	■	■	
2. Collect information in the company					■	■	■	■	■		
3. Analyse information						■	■				
4. Develop new systems in the company							■	■			
5. Test the new systems							■	■	■		
6. Summarise the improvement										■	
7. Write up and submit the thesis								■	■	■	
8. Presentation											■

1.6 Expected Results

1. Cost reduction in the warehouse and transportation department.
2. The efficiency of operations is increased in the warehouse and transportation department.
3. Better working environment in the warehouse by improving some operating methods to be more simple and convenient.
4. To provide a guideline in improving the material handling routing in a warehouse and scheduling in transportation.