



## CHAPTER 1

### INTRODUCTION

Data Storage Product business is one of the toughest businesses in the world, the manufacturers need to launch the new product on the market before their competitors and also need to ship the product to customers as fast as they want. One of the most important factors to achieve the stated goals is the Resource management system.

The resource in production plant can be Man, Machine or Material. Every resource is all important. But the one that I'm interested in is Material. With the good Material management system, the company will take advantage on the competitors both the term of time to market and the term of cost.

The efficient material handling system is the foundation of the good material management system. Most of the world-class manufacturing process plants are equipped with reliable and calculable Material handling systems. That is because they can get the exact data about the transportation time, the energy consuming and other useful information for process planning and management form the reliable and calculable material handling system.

From the important of material handling system, we can say that with the competent system, the beyond step in manufacturing process improvement would be much easier. So the result of this study will be very useful information in achieving the enhancement in manufacturing process in production plant.

Material Handling System is one of the most important parts of the manufacturing business. The manufacturers have to manage their resources in order to smooth their process. Material handling logistics assumes a very strategic role in the improvement of order to delivery cycles, inventory reduction and satisfying changing buying culture and behavior. As a result, we expect

exceptional opportunities for the industry both domestically and internationally. Material handling logistics, when thought of as a process, remains at the core of manufacturing, distribution, consumption and disposal activities-indeed, at the heart of productivity. Continued restructuring and realigning of industry will provide substantial real growth potential for material handling equipment and systems providers in the years ahead, helping to keep the industry one of the world's largest and fastest growing.

The problem of selecting and specifying material handling systems for manufacturing operations is challenging because of the variety of technologies available for material handling tasks and the significant fixed costs of systems. Most of the previous work in this area usually does not address the selection of system from among different technology types, such as forklift truck and AGVS, nor do they reflect the possibility of selecting and/or partitioning material handling tasks and assigning them to technology applications. This paper presents a four-step approach to the problem, consisting of task extraction, filtering tasks and matching them with resources, task aggregation, and system selection.

Market forces, starting with the consumer, are driving logistical evolution throughout the supply chain as the consumer demands variety, availability, convenience, quality and affordability.

As a result, efficient physical movement of merchandise from producer to consumer has become a priority and trading partnerships are developing to facilitate the fastest physical movement of material and delivery of services at the lowest cost.

The economic selection of manufacturing processes for the manufacture of a product is crucial in today's highly competitive manufacturing environment. Since the price available for a product is solely dependent on the competition, a proper economic selection of the manufacturing processes and tooling, together

with proper product design, materials selection, and materials handling, help to achieve target costs. Unless target costs are achieved, manufacturing would not be competitive, and it would be difficult for the manufacturing unit to survive.

This study will be consisted of the use of economic evaluation concepts like break-even analysis, lifecycle cost analysis, overhead cost allocation, and a review of the important manufacturing processes and tooling available for different engineering materials and product designs. The role of cost and economics in the selection of alternative materials, processes, tools, speeds, material handling systems, degree of automation is brought home to the manufacturing and design engineers. In order to balance the initial capital cost and the recurring lifetime costs of scrap, energy, environment, etc., the lifecycle cost analysis, using discounted cash flow methods, will also be covered.

## 1.1 Statement of Problem

After the automation productions of HGA and HSA have been introduced at Teparuk Plant, there are many problems about the production support operation since the automation production rate is much higher than manual production rate, while all of the operation support system is still remained the same as while the production is still manual system.

Material handling is one of the impacted operations. So we need to consider if the current system is appropriate for the new production capacity. We can find that the new capacity from the automation production is much higher than the manual production.

- Maximum HGSA plant capacity for Automation production: 250 K units/day
- Maximum HGSA plant capacity for manual production: 90 K units/day

Moreover, the new product is also concerned with the quality issues. The inventions on the storage product tend to make the product smaller and more delicate. The areal density for the new hard drive in 2003 is as much as 100 Gigabits/in<sup>2</sup> or 5 million times compare to the first hard drive invented in 1957 with areal density of 0.002 Megabits/in<sup>2</sup>. From the product delicacy, the new coming storage products need special attention on both how to keep it clear from the contamination and how to handling and process it carefully.

From the capacity and quality concerns, the selection criteria for material handling are the important factor to keep the hard drive production process smoothly.

## 1.2 Objective of the Study

Be able to state the Selection Criteria for Material Handling System for Seagate Technology, Teparuk Plant.

## 1.3 Scope of the Study

1.3.1 The studied site is Seagate Technology, Teparuk Plant, Thailand, Disc drive components manufacturer.

1.3.2 Focus on material handling system in manufacturing site.

## 1.4 Expected Results

1.4.1 Be able to make decision whether to continue the existing material handling system and increase the labor or implement the automation material handling system with appropriate justification.

1.4.2 If the automation system is selected, we are expected to select the most appropriate system both in the cost of ownership and system performance aspects.

1.4.3 Prepare the system installation plan based on the capacity requirement with the least impact on site's operation.

## 1.5 Methodology

1.5.1 Study theories and researches involving the thesis

1.5.2 Collect data for Decision Making Theory

1.5.3 Survey the available material handling systems in the market

1.5.4 Study scope of the project

1.5.5 Study state of nature and its condition

1.5.6 Study and analyze each criteria in each state of nature and condition

1.5.7 Summarize the decision result and the effects

1.5.8 Summarize the information

1.5.9 Report Preparation

## 1.6 Project Schedule

<b>Activities</b>	<b>Oct. 2003</b>	<b>Nov. 2003</b>	<b>Dec. 2003</b>	<b>Jan. 2004</b>	<b>Feb. 2004</b>	<b>Mar. 2004</b>
<i>Study theories and researches involving the thesis</i>	■	■				
<i>Collect data for Decision Making Theory</i>	■	■				
<i>Survey the available material handling systems in the market</i>		■	■			
<i>Study scope of the project</i>		■	■			
<i>Study state of nature and its condition</i>			■	■		
<i>Study and analyze each criteria in each state of nature and condition</i>				■	■	
<i>Summarize the decision result and the effects</i>					■	■
<i>Summarize the information</i>						■
<i>Report Preparation</i>			■	■	■	■

Table 1-1: Project Schedule