CHAPTER 1

INTRODUCTION

1.1. Background of the Research

Nowadays, plastic is a popular material for a utensil of various products, such as consumer products. So, the plastic utensil industry in Thailand is a base for other industries that the utensil will change to use plastic more and more. There is an important trend. The case factory is a subcontractor of a big company in producing the plastic utensil following the design of the customer. This company emphasises on producing medium quality plastic utensil. Most of their products are water bottle, shampoo bottles, baby powders and cosmetic containers. The processing line chosen in this study is a milk bottle processing line. The reason that this line is chosen for this research because it is the main processing line of the company. It is the biggest processing line that utilizes capacity more than 50% of overall capacity. Besides this, sale of this product is about 49% of overall sale. So, improving productivity of this line will provide the most benefit to the company.

The production process of a milk bottle may be explained as below;

1. Load raw material in the blow molding machines.
2. The machine produce the milk bottle
3. A operator cut and dress the bottle

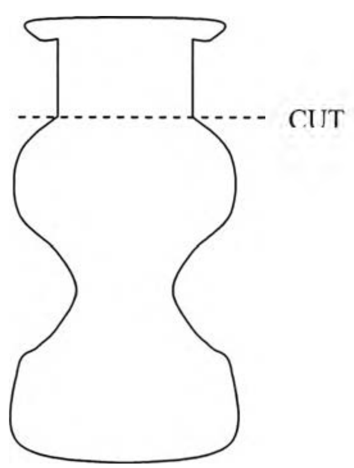


Figure 1.1 Cutting and Dressing Bottle Milk

4. test the quality of bottle
5. screen bottle
6. bake the screened bottle in the oven
7. inspection a quality of paint and counting amount of bottle
8. contain in the box for sending to the customer

FIGURE 1.2. THE PROCESS CHART

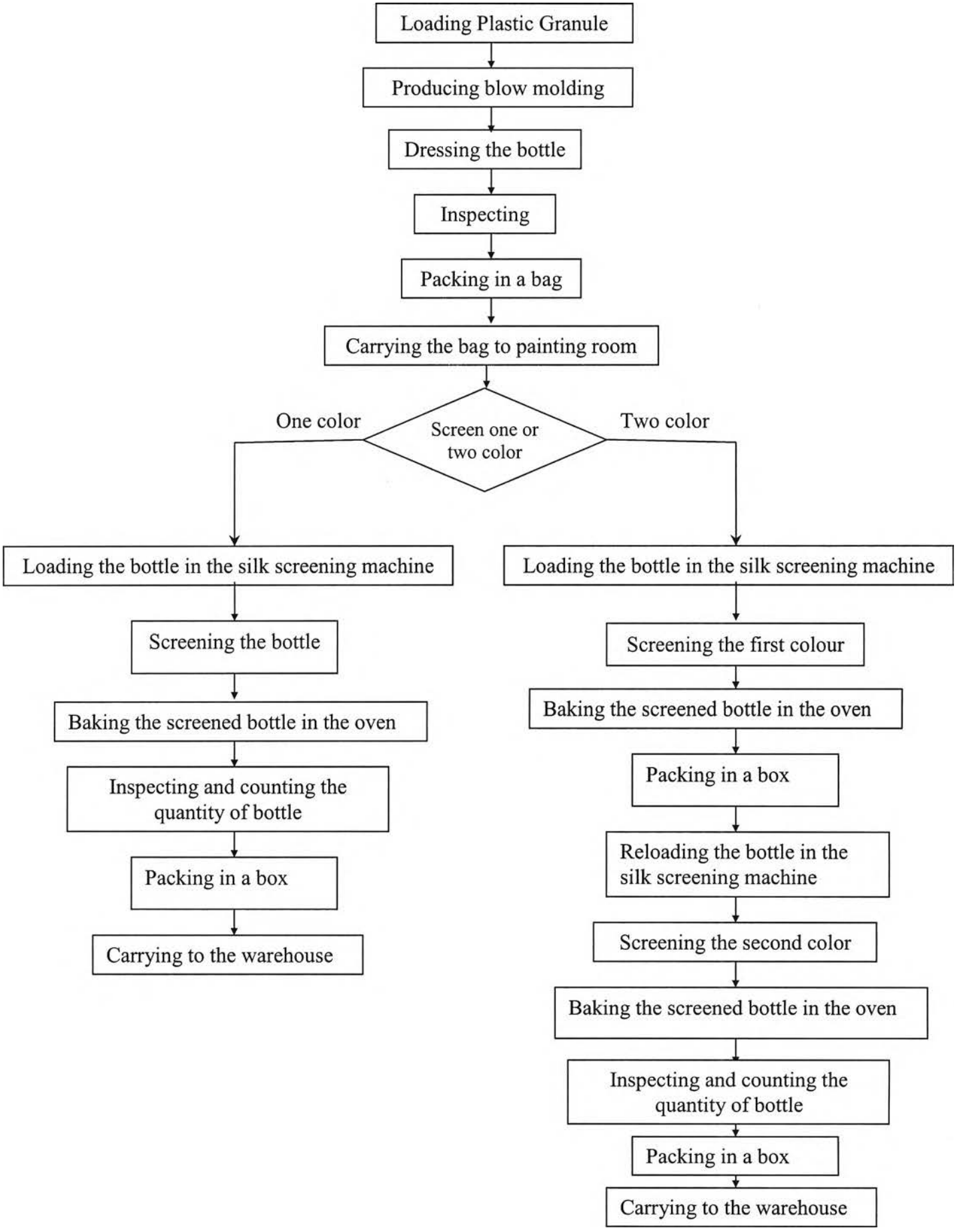
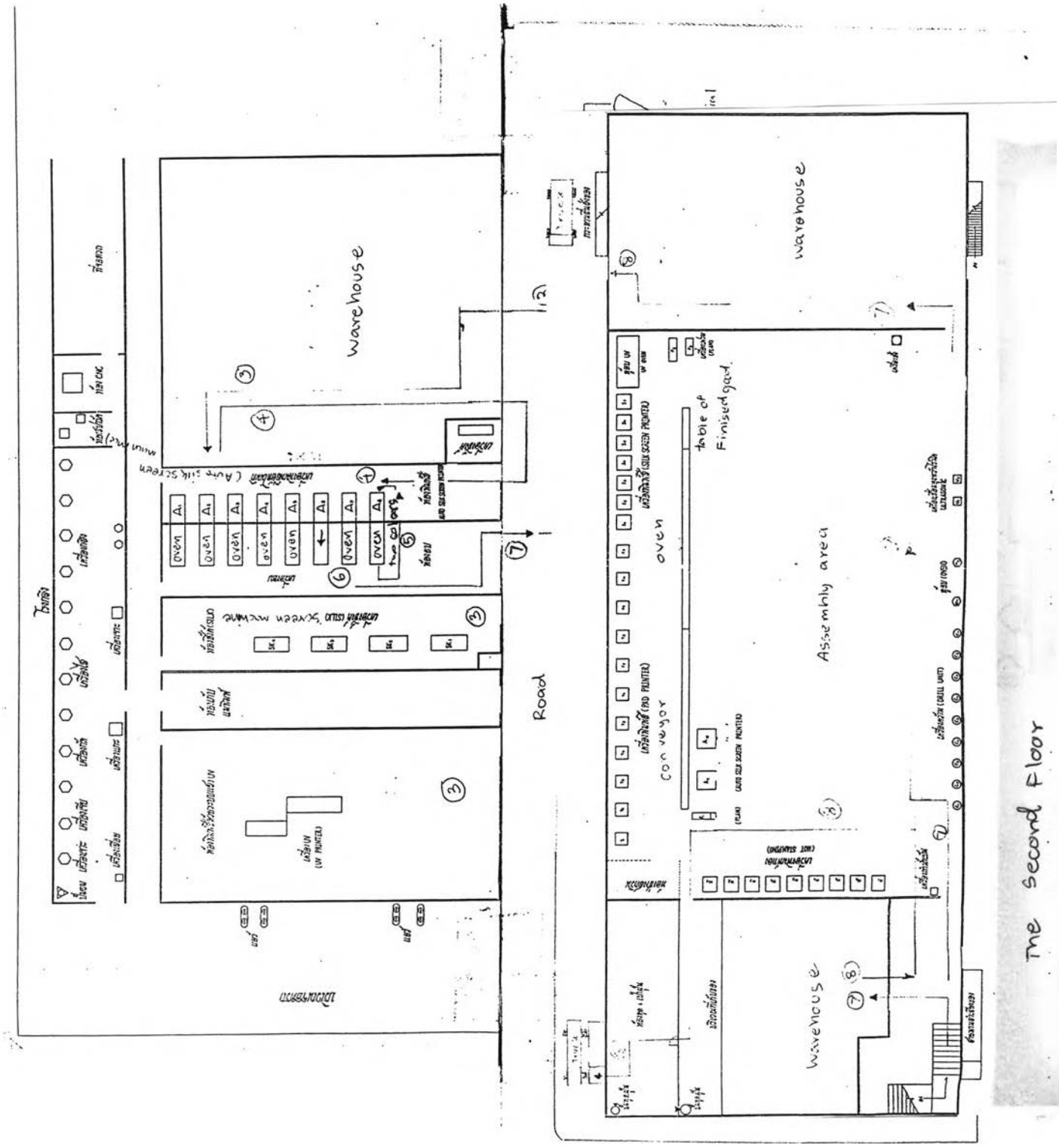


FIGURE 1.3. : PLANT LAYOUT



Activities in this plant layout;

1. Bring plastic granule from warehouse to blow molding machine room.
2. Blowing the milk bottle
3. Bring the milk bottle to keep in the stock for one day for setting of plastic structure
4. Bring the bottle to auto silk screen printer room
5. If the bottle has two screen colors, the bottle need to bring back to the machine again.
6. Pack the finished good in a box
7. Carry a box of finished good load in a truck for delivery to customer finally.
8. Carry the stock good load in a truck for delivery to customer finally.

Machine

This company is medium industry with 32 blow molding machines which the capacity of work piece is 100-5000cc.

Workforce

There are 400 workers which they are working in two shifts. The factory runs 24 hours a day and 7 day per week with workers having a rotating vacation. For example, some workers have vacation day on Monday, another will have on another day, such as, Tuesday, Wednesday or other days in order to run the factory 24 hours a day.

1.2. Statement of the Problem

The plastic utensil industry has high competition in price of product and on time delivery of the product. If anyone has lower cost and shorter lead time of production, that company will have stronger competitiveness. So, researching to improve productivity is a one way in achieving these purposes. This factory always faces a problem in delivery the product to their customer on time. Especially, the uncertainly demand that exceed more than their ability to produce in commitment

period. That result to the company has to stock the bottles and purchasing new blow molding machine for serves this demand. With the rush of order, the company pay their ability how to produce the product to serve their customer as fast as possible. They have no time to interest in improving performance of productivity. Having a good plant layout is a certain factor to support improving productivity. Because, it effects to utilize resource including area, machine, raw material and workforce effectively. That allows generating a quality product, short lead time (eliminate unnecessary work in process and material handling), safety workplace environment. So, researching in this area will be benefit to them to make more profit with out large investment. Besides, it is a base for develop and expand the factory in the future.

In the production line of a case study factory, the lateness of production that is the result of the plant layout problems can be defined as following;

1. Route material flow meanders that effect to lead time that is longer than it should be. For example, transferring the work in process product from the silk screen room to the stock of finished good that the stock stay on the second floor that effects to delivery is longer than it should be. If the stock stay on the first floor , the distance will be reduced than before.
2. High delivery of work in process material that use a lot of workforce to do that and loss time of production. Such as, transportation of work in process between injection blow molding department to the silk screen room that is separated in to two building that use a lot of workforce in delivery.
3. The position of each department is very far away that losses time and cost of labor to transfer material between each department.
4. Having a problem in line balancing and bottle neck of production. That can be found that the idle of man and machine during operation.
5. High work in process that because of a poor plant layout and poor management that lead to obstruct of the material flow.
6. Route and footpath in production line are narrowed by a stack of work in process material that it is not kept in the right area. For instance, the injection blow molding department that has a lot of work in process and raw material in the side of foot path.

1.3. Objective of the Research

To study, analyze and improve the present situation of the case study factory in plant layout area in order to reduce production lead time cost and transportation.

1.4 Expected Results

1. Lead time of production reduced
2. Unnecessary activity eliminated
3. Productivity increased
4. Cost of production reduced
5. Factory area is utilized fully
6. Transportation is effective
7. Similar improvement may be applied to other processing lines.

1.5. Research Procedure

1. Study and analyze the layout of milk bottle processing line.
2. Identify the real cause of problem.
3. Survey and study the relevance literature
4. Define the way in improving the layout of the processing line base on industrial engineering and engineering management knowledge such as, plant layout, work study & work measurement.
5. Compare production lead time, cost and transportation distance, before, during and after the improvement.
6. Summary
7. Write the thesis report

FIGURE 1.4. : THE RESEARCH SCHEDULING

Programme	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1. Study and analyze the layout of milk bottle processing line and operation							
2. Identify the real cause of problem							
3. Survey and study the relevant literature							
4. Define the way in improving the layout of the processing line.							
5. Compare the output before, during and after the improvement.							
6. Summary							
7. Write the thesis report							