

Executive Summary

The main focus of this project is to increase the production achievement rate in Apple Thread Company (Pvt) Ltd. Apple Thread is a family owned company and they reprocesses sewing thread and manufactures elastic. The company also distributes their products all over the island by internal staff.

It was evident that the production of the company is not up to the level of the demand in the market and increase in customer complaints and increase in demotivation level of sales staff could be seen within the company. The production achievement rate or the order filling rate was approximately 88% in the company according to the data from 1st January 2016 to 30th September 2016. Increasing the production achievement rate up to 95% was the main objective of this project implementation.

Many causes for the business problem could be revealed through the cause and effect analysis. But most significant causes were selected by a brainstorming session to address in this project. Theoretical background for the business problem was referred to get a deep insight in to the problem and the techniques for resolving the problem were referred based on the areas on process management, inventory management, production planning and controlling, machine maintenance and staff training. The project consisted of five major components covering the theoretical framework of the project. Those components were; current situation analysis, restructuring of inventory management system, production planning and controlling, implementing preventive maintenance system and staff training. Techniques related to these areas were used to resolve the main business problem. Process map, brainstorming, capacity map, work breakdown structure, priority rules, production schedules, Kanban boards, standard operating procedures, simulation, workplace arrangement, ABC inventory classification, preventive maintenance checklists and staff training programs are the techniques used as solution for the bigger problem of the company.

The project owner could achieve 96% production achievement rate by 15th January 2017.

Chapter 1

INTRODUCTION

1.1 Background

Apple Thread Company manufactures thread and elastic and they distribute them along with other garment accessories which are supplied by the local market. The company has seventeen years of history and its distribution channel claims for 36 years of history. Until December 2015, the distribution of the company was done by delivery vehicles. All the goods are delivered at the time the order is taken. The main disadvantage of this system was the limited space in the delivery vehicle to keep goods. Once the vehicle leaves the stores, it is difficult to refill the stock to the vehicles especially the vehicles which cover the remote areas of the country. Hence the company took a decision to change its distribution system in to a more flexible system. Three teams were appointed to cover the sales of the entire island. Sales referees are only assigned to take orders by visiting retail shops with their item display cards. This order taking part is done using fuel efficient cars. Total stock of the company's products and other products are maintained in the center warehouse and all orders are packed accurately by the stores staff. Separate delivery staff is assigned to deliver the goods to relevant shops and they are responsible for the collection of payment as well.

The company expects to fulfil the customer requirements fully by changing the distribution system. However past six months data indicates that even if the distribution process becomes strong, the production process is not up to the standard level in order to full fill all the requirements of the customers without delay. Even though the company gets more and more orders, a problem of underutilization of capacity can be seen within the production unit and it leads to loss of revenue to the company which could be easily gained. Hence providing the best solution to increase the production capacity is the main purpose of this skills project.

1.2 Project

The project is directed towards increasing the capacity of the production department of the company. According to the key problem identified by the author, the order fulfilment rate or production achievement rate needs to be increased. According to the analysis done for the past six months from January 2016- June 2016, the average production achievement rate marked as 88% even although the company expects it to be the 98%. The average lead time for one thread item is three weeks even though it is expected to be one week. This analysis was done only for polyester thread since it is the key product of the company. This product category is imported and reprocessed within the company and the degree of the effect of external factors is low.

The overall purpose of the project is to increase the production achievement rate of polyester thread product in the company up to 95%. In order to accomplish this target, the company needs to change some internal factors where necessary. This project is expected to do a survey in the company to understand the key activities and identify the improvements that would be required. Productivity improvement methods and techniques are expected to be applied in order to gain the expected result of this project.

1.3 Significance of the Study

Domestic market of thread industry is shrinking day by day. Competitiveness in the shrinking market is higher than in the normal market. Quick response to the order requirement is the competitive advantage in such a market. When the company fails to fill the order requirements of the customers on time, competitors try to fill the vacuum and then it leads to a reduction in the company's market share and to increase the competitor's market share.

The failure of production achievement also leads to a loss of revenue which the company can achieve easily when orders are taken and completed. Those weaknesses have a negatively impact on the profitability of the company as well as on the cash flow.

Major drawback of this problem is customer dissatisfaction. Retail shops are the main customers of the company. When they receive less goods than the amount they ordered,

they get dissatisfied regarding the service of the company. The trust they keep on the company will be broken.

Further, the company's sales representatives work hard to take orders from retail shops while facing the challenges from competitors. They earn commission and bata incentives as a percentage of the sales. When the company fails to fill those orders 100% on time, even the sales representatives also lose some portion from their commission and bata incentives. This will lead to demotivation of sales representatives as well as other employees who get incentives which are calculated on the basis of the sale in the distribution section.

The company is now moving towards the industrial market as a strategy of surviving. It is an important decision as a company who competes in the domestic market, especially in a market that is shrinking. Also the process of the company becomes more and more complex since they have to customize their production according to the special requirements. Company's normal practice was to dye thread in a mass scale in order to achieve economies of scale. But when it deals with the industrial market they had to change it in to 'small batch production'. Moreover, the company had to change their dying process in to "match to dye" where the company has to cater to the different colour requirements of customers. Apple thread maintained a pre decided color range for the domestic market before they changed the process. Hence quick response and on time delivery are the key success factors of the company and also the key challenges for the company

The project tries to pay attention to increase the production capacity in the polyester thread production department which enhances the company's ability to achieve order requirements. This will help the organization to strengthen the image of the company in the domestic market as well as in the industrial market while increasing the profitability of the company.

1.4 Methodology

The business problem of Apple Thread Company was identified through analyzing past data for nine months. This analysis was done by gathering the order placement data and the sales data of the organization. A lead time analysis for the production department was

carried out for the past nine months. The problem identified in the organization has been proved with evidence.

An organizational and industry survey was carried out to understand the background of the company. SWOT analysis was carried out to analyze the strengths and weaknesses of the company and also it analyzed the current opportunities and threats which affect the organization within the industry.

Process map is drawn for the organization to understand the current situation and to identify the areas which need improvements. Root causes for major problems in the organization are identified through cause and effect diagrams and brainstorming programs conducted with the participation of key personnel within the organization. Major reasons behind the broad organizational problem were identified according to above described techniques.

The project is focusing on the increase of production achievement rate while reducing the lead time for production. A survey is conducted to gather data and identify the weaknesses in the process to achieve that target. Then the project will be carried out to find the best solutions in order to reduce or eliminate the weaknesses. The implementation of solutions in this project will be done under four major components.

A better planning process will be proposed by analyzing the demand situation of the company. A survey on the capacity of the organization will be done and implementation of planning method will be done accordingly.

A proper inventory management system will be proposed under continuous inventory management system

Preventive maintenance system will be proposed in order to prevent stoppage of production due to machine breakdowns. Techniques such as maintenance plan, Standard maintenance procedures, Training of employees are discussed under TPM.

Staff training program will be conducted for employees to provide training on the changed system

1.5 Limitations

Apple Thread Company (pvt) Ltd is a medium scale company, which is in the developing stages. They operate in Horana area with a limited space. Even though they acquired a land to rebuild the plant, the project had to be stopped due to issues in obtaining permission. Hence this project needs to be carried out in limited space. Due to the limitation of space, the author cannot do change in the layout.

Another major limitation for this project to be implemented is the absence of personal with key knowledge within the company, especially in the mechanic area. But total productive maintenance will be implemented by engaging machine operators and outsource people.

Even though author has identified a major number of root causes for the key problem, it is impossible to implement all the solutions within three months. Hence this project only considers a few areas of improvement which are feasible to do within period of three months.

The company operates two main product categories. They are polyester thread and Elastic. According to the analysis done by author, the polyester thread (domestic) is committed to the company's profitability than elastic. Hence this project is limited to Polyester thread (domestic).

1.6 Chapter Framework

Chapter 1 gives a brief description to the problem identified and gives a brief understanding regarding the aim of project. Significance of the study is provided together with the benefits to the organization. Data collection methods, tools and techniques used in the project are described under "Methodology". Limitations for the project the author has encountered during the project is also described in this chapter.

In Chapter 2 the author first provides an introduction to the chapter and then provides a description to the problem identification is done together with an introduction to the organization concerned. Identification of the organization will be done with an introduction followed by a SWOT analysis and then an evaluation is done on the internal factors and external factors. Problems which are identified in the organizational analysis

are discussed in brief. The key problem of the organization will then be considered in this chapter explaining linking to the revenue and profitability in this chapter. A chapter summary will be provided at the end of the chapter.

Chapter 3 starts with an introduction and then it gives the theoretical background to the problem. Theoretical background is presented under four major topics. i.e. production planning and control, inventory management, preventive maintenance and staff training. Framework of the study is developed using the theories which was referred to. Then the technique which was identified in resolving the problem is explained and the chapter will be ended with a summary.

Chapter 4 gives an introduction at the beginning and then provides information of the project. First the author will describe the objective of the project followed by project components that the author will follow in this project. Resource allocation for each project component, cost estimates and benefit-cost analysis for the project is also provided. Then the expected project output and outcome is explained for each component and the project plan is presented. Chapter ends with a summary of the chapter content.

Chapter 5 provides an introduction to the chapter and gives the information regarding the project implementation. Project cost, deliveries and time variations from the expected figures will be presented together with the reasons for the variations. Issues faced by the author are also discussed in this chapter. Summary is provided at the end of the chapter.

Chapter 6 starts with an introduction and then the author discusses the outputs and outcomes of the project. Activity based benefit-cost analysis is carried out in order to show the benefits of the project. Then the author will discuss the skills gained through this project such as conceptual skills, interpersonal skills, and technical skills. Finally the management of project is described with the aid of gantt chart. Summary for the chapter content is provided at the end.

Chapter 2

ORGANIZATIONAL ANALYSIS AND PROBLEM IDENTIFICATION

2.1 Introduction

A detailed introduction to the company is given in this chapter together with the organizational profile and the process chart. SWOT analysis and IFE and EFE matrices are carried out in order to understand the status of the organization in the industry as well as among the competitors. Then the detail of the identified problems through SWOT analysis are described and the key problem which is going to be addressed in this project is described linking to the revenue and profitability loss of the company due to that problem.

2.2 Organizational Profile

Company started in 1986 with the name of “ Jayasinghe Distributors”. The company started its business as a dealer for a well reputed brand name for sewing thread in the market. The brand name “APPLE” was founded by late Mr.J.G.Wimalatissa. He started his own manufacturing plant for reprocessing of sewing thread for domestic market in 1999. The company name changed in to “Apple Thread Company (pvt) Ltd in 2010 with three directors. Over the past years company has improved in its product line while gaining the trust of customers. The key products that the company operates are;

- 100% polyester thread
- Elastic tape
- Embroidery thread
- Cotton stranded thread

Apple thread mainly operates in the domestic market. But recently they entered the industrial market as well. Key competitors of the company are “ Coats Tootal Lanka” and “ Naturub”. The company currently operates at an annual turnover of 60 million.

The company consists of Dye plant with the capability of dying thread in 8 kgs and 25 Kgs, manufacturing plant consists of two domestic thread winding machines, two

industrial thread winding machines and 60 elastic braiding and knitting machines, packing section and the finished goods stores.

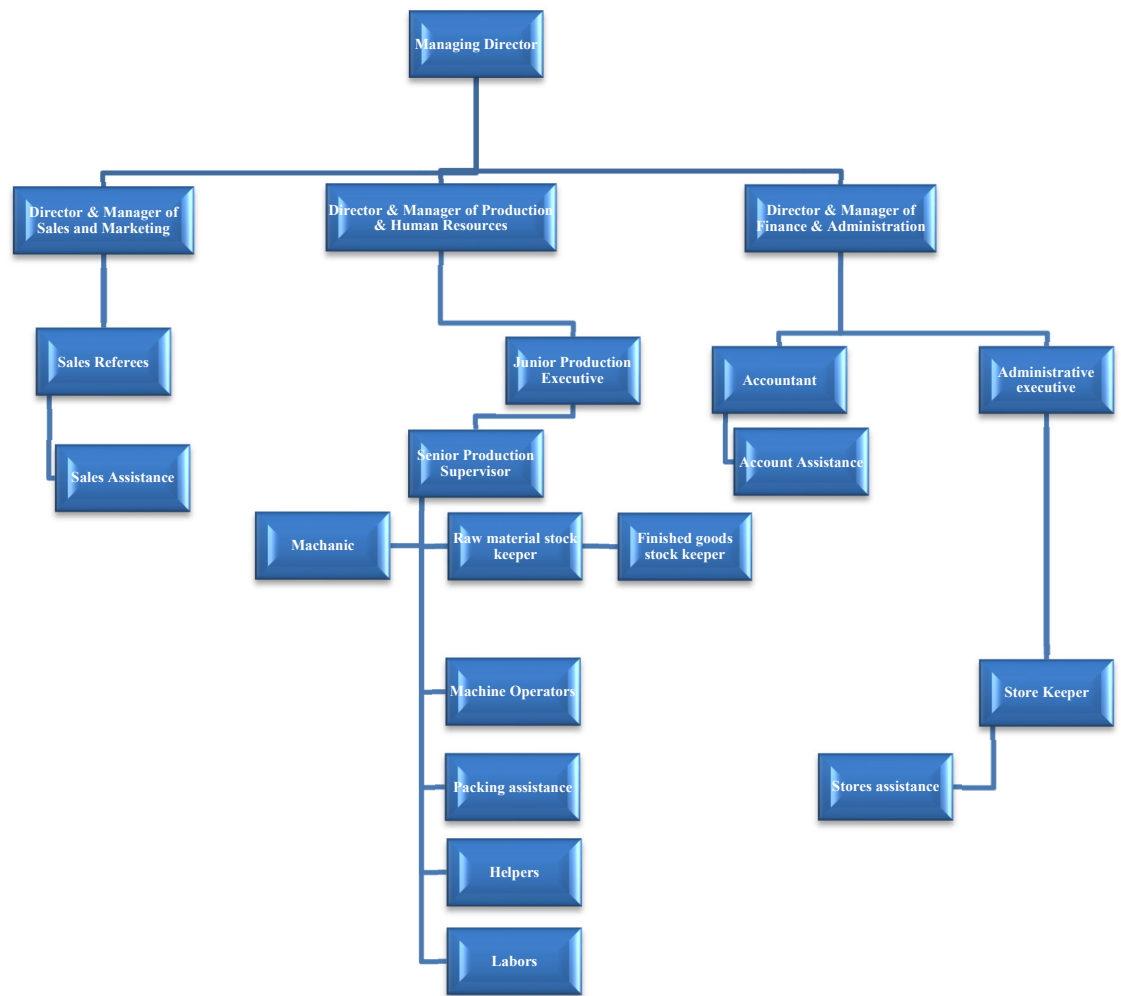
The company's production is mainly based on mass production at the same time it tries to move towards small batch production in order to cater to the industrial market. The domestic market and the industrial market of sewing thread have distinguished characteristics which need to be taken in to consideration. These characteristics differences are listed in appendix 1.

Apple thread imports raw yarn from China and the product then goes through the reprocessing stage. The production process of the polyester thread is shown in appendix 2.

2.2.1 Organizational Structure

Apple Thread Company is a small scale manufacturing company which consists of 40 personnel. Organizational structure of Apple Thread can be considered as a functional structure. The organization is led by the managing director who has the technical knowledge as well as the managerial knowledge. Three directors lead the company other than the managing director and they also are responsible for key three areas of the organization. One director handles the work as the manager for sales and marketing while second director handles the work as the manager-production and human resources and third director who is the author of this project handles the work as the manager of finance and administration. The entire organizational structure of the company is shown in the figure 2.1.

Figure 2.1 Organizational Structure



Source: Author

2.2.2 Vision

Be the leading quality supplier for fashion makers.

2.2.3 Mission

Reach the highest customer satisfaction by providing high quality products with high varieties which suits the customer requirements at the best price in the market.

2.3 Organizational Analysis

2.3.1 SWOT Analysis

Table 2.1 SWOT Analysis

Strengths	Opportunities
Technological knowledge of key personnel	Expose to the new market in north and east of the island
Strong brand image in the domestic market	Huge market in the industrial market
Strongly built-up customer relationship	Opportunity to expand product line (add other garment accessories in to the product line)
Strong supplier relationship	Opportunity to increase the production capacity
Connected with well functioned distribution channel	
Strong employer employee relationship	
Weaknesses	Threats
Underutilized machine capacity	Decreasing demand for thread in domestic market
Financial instability due to long credit period given for customers	Decreasing the availability of labour employees
Depending on one supplier for raw yarn	Tight rules and regulations for expansion of business
Poor profit margin on some products	Price competition in the market
Lack of Research and Development	Changing government rules and regulations regarding business with the change of governments in Sri Lanka
Production delays	Unstable environment in Sri Lankan business
Lack of advance technological machines	Tight rules and regulations regarding the raw material imports in Sri Lanka
Absence of preventive maintenance	Advancing technology in the industry
Absence of standard operating procedures	
Absence of proper planning method	
Maintains large inventories and absence of inventory management system	
Limited space for operation (No space for expansion)	

Source: Author

2.3.1.1 Strengths

Key personnel of the company (Directors) are well aware about the technology of the product. Therefore issues regarding the product technology can be solved easily. The brand “Apple” has operated more than sixteen years in the market and it is a well-known brand among the customers who are engaged in sewing and the brand has gained the trust of consumers as a quality product at a low price. Better customer relationship has built up by

the company through its long lasting distribution channel. Supplier relationship is also built up for a long time by maintaining few suppliers within the company. Employer employee relationship in the company is different from other companies. The gap between the managerial level and the employee is not very much and a close relationship is maintained. Hence any problems in the company can be discussed with management openly. This system enhances the loyalty level of employees.

2.3.1.2 Weaknesses

Underutilization of capacity is the major weakness in the company. Company uses human and non-human resources in the operation. Underutilization of these resources leads to increase in the cost of production and reduce the profit margin of the company.

Since the company mostly deals with retail shops, customers are given longer credit period but company does not get such credit period from suppliers. Hence the cash flow within the company is weak and capital investment is not easy for expansion.

Company has been importing raw yarn from one supplier for a long period and the supplier is from China. There is some risk in dealing with one supplier especially when the company totally depends on imports. If the supplier stops providing goods, the company will have to spend more time and money for finding another supplier.

Price competition for sewing thread in Sri Lanka is high. Hence company cannot price their products higher than the competitors. To survive in the highly competitive market the company has to keep their price down by scarifying the profit margin. To avoid this weakness the company has to reduce their production cost.

Research and development is the key advantage for any market. Apple thread pay less attention for their research and development. Hence company need to strengthen their R&D within their company in order to compete effectively in the future market.

Production delays is one of the major issues in the company and delays in production affects the good image of the company. Mainly the production delays occur due to the absence of a proper planning and controlling system and at the same time the problem of production delays become worse because of the absence of a standard operating procedure in the production process.

Company uses old machines which are highly manual. More and more human resources are required for this kind of machines. But competitors use technologically advanced machineries and the production capacity of competitors is higher than the company. By using advanced technology, competitors can reduce their production cost which Apple thread cannot achieve.

The production stoppage of the company is a common problem within the company. Past data of the company reveals that the average seventy one hours of the monthly production time is stopped due to machine breakdowns. Details of the machine breakdown time are provided in appendix 4. Absence of total productive maintenance system enhances the problem of machine breakdowns.

Unavailability of a standard operating procedure leads to confusion among employees and it increases the defect rate of the company which requires more resources for correction.

Apple Thread maintains a high inventory of their products within the company. The polyester thread product category consists of more than four hundred colours of products and the proper maintenance of the inventory is highly essential for timely delivery of orders. Raw material inventory is also important for continuous production. Absence of a proper inventory management system within the company leads to unfulfilled orders as well as stoppage of production. Hence a proper inventory management system is highly important for the company.

Another major weakness that the company suffered from is the lack of land space for expansion. Apple thread operates in 30 perches land in the rural area and it is expanded in to maximum level where the operators can work comfortably. Further expansion of the company is limited because of the limited land space. Apple thread has acquired a two acre land which is close to the current operating area. But the expansion project is stopped due to delays in gaining permission from Urban Development Authority. An efficient layout of the production unit is difficult to arrange due to these space limitation.