How Becoming Lean Can Improve Performance: A Study on Bangladeshi Garment Industry

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INTRODUCTION

In this article the researchers would like to discuss two basic points: Why lean production systems becoming increasingly important as a technique to improve organizational performance and how two Bangladeshi garment firms brought changes in their traditional business process through LPS (Lean production system).

"Lean production is the end point of the process leading out of the Fordist-Tailorist paradigm". Lean production places emphasis on the elimination of non-value added activity as well as waste from the production process. The goal of lean is to satisfy the customer by delivering the highest quality at the lowest cost in the shortest time (Manufactured Housing Research Alliance, 2005). The major purposes of the use of lean production are to increase productivity, improve product quality and manufacturing cycle time, reduce inventory, reduce lead time and eliminate manufacturing waste. To achieve these, the lean production philosophy uses several concepts such as one-piece flow, kaizen, cellular manufacturing, synchronous manufacturing, inventory management, pokayoke, standardized work, work place organization, and scrap reduction to reduce manufacturing waste (Russell and Taylor, 1999). In lean production systems attempts are made to eliminate waste through continuous improvement of processes of the entire value chain in the organization. Having nurtured a lean manufacturing mindset among the employees, it facilitates achievement of continuous product flow through physical rearrangement and control mechanisms. A study (Sohal, 1996, p.91) indicates that *"most western manufacturers have been aware of the need to improve their performance and competitiveness for nearly two decades"*. They were using lean production system for taking advantage of most of the above benefits. Another study (EPA, 2003) summarized the main reasons for adopting a lean system under three broad categories: reducing production resource requirements and costs, increasing customer responsiveness, and improving product quality. It concluded that all of these combine to boost company profits and competitiveness. In the late 1980s, the term "Lean Production" was introduced in a book titled *The Machine That Changed the World* written by **Womack et al. (1990).** *"The idea of lean thinking comprises complex cocktail of ideas including continuous improvements, flattened organization structures, team work, elimination of waste, efficient use of resources and cooperative supply chain management"* (Green, 2000, p.524). This is a Japanese concept applied in manufacturing firms. The Japanese firms (firms in other countries as well) have been using this concept to reduce the cost of any process (be it service or manufacturing) by removing waste. The basic elements of the concept include waste elimination, continuous one piece workflow (EPA, 2003).Lean production encompasses the total manufacturing chain from product design to product development, and it even embraces distribution (Cooney, 2002). According to the National Institute of Standards and Technology Manufacturing Extension Partnerships Lean Network, lean refers to systematically identifying and eliminating waste through continuous improvement using the pull production with a view to get perfection (Kilpatrick, 2003). Lean shortens the lead time between a customer order and the shipment of the products by elimination of all forms of waste in the production processes. Simply said, *"lean principles and methods focus on creating a continual improvement of culture that engages employees in reducing the intensity of time, materials and capital necessary for meeting customer's need"* (EPA, 2003, p.1). This operational strategy targets to achieve the shortest possible cycle time by eliminating waste. This strategy aims to increase the value-added work by reducing incidental work. This technique is used to increase profitability by reducing cost and by understanding the meaning of value to the customer because value is the major determinants of lean manufacturing. **Companies are now** convinced about the benefits of lean, and they are using this technique in both production and service functions.

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Previously, the jute and tea industries were the largest export-oriented sectors of Bangladesh (Rahman, 2004). The same study reported that gradually the manufacturing sector, especially the garment industry, has received greater attention. *"Among the top two dozen major exporters of clothing products in 1998, none has grown faster than Bangladesh since 1980s"* (Spinanger, 2001, p.1). The garment Industry in Bangladesh stands as a unique example of poor developing nations which has taken the advantage of participating in the global economy for fast economic development facilitated by recent trends in globalization (Quddus, n.d.). In response to this high competition Bangladeshi garment firms are also trying to reap maximum benefits from new techniques. **T**his research aims to explore the adoption of lean practices in the Bangladeshi garment firms and its impact on manufacturing performance improvement so that the extent of their application and the existence of enabling environment can be discerned.In this study two companies have been chosen to see the performance improvement through lean production practices. **The companies' website provides the background information about the company. Lean-related information was collected through interviews with the Plant Manager of the company.**

CASE STUDY ON GARMENT FIRMS

COMPANY PROFILES

The profiles of the two surveyed companies have been prepared based on the data gathered from the company websites, interviews with the company officials and published materials of the companies. The organizational profiles of each of the companies include establishment and operation, business orientation (export-oriented or local market-oriented), human resources, products and production capacity, market/customers, and relevant information on lean implementation.

PROFILES OF THE ORGANIZATION

COMPANY 1

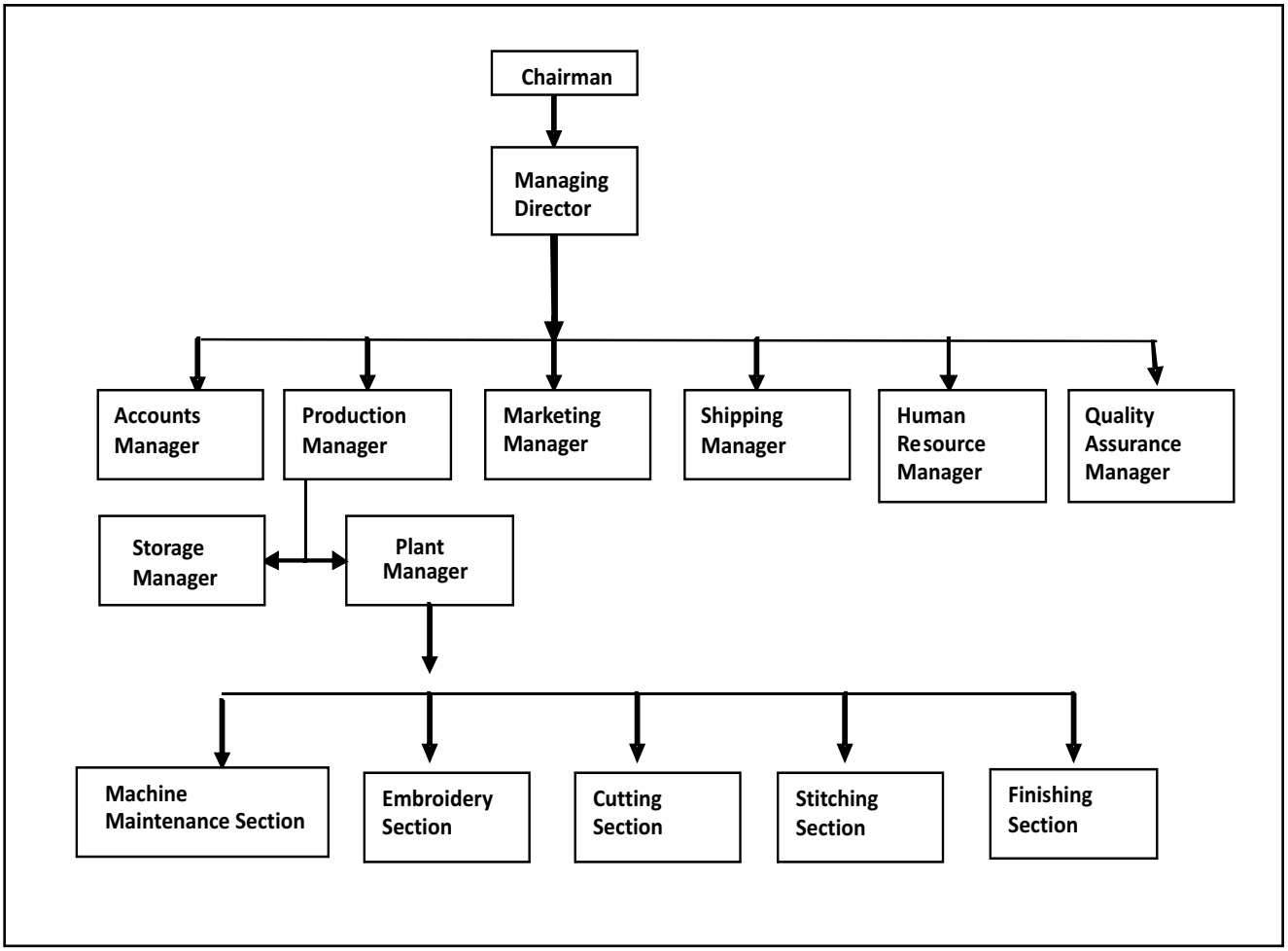
The term "DADA" comes from the idea, 'the more the better'. DADA Corporation was first established in Seoul, Korea in 1974. It started with a small factory of headwear. The second DADA concern DADA (Savar) Limited started its operation in Bangladesh in 1993 but went into production in 1994. DADA has its own factory building at Dhaka Export Processing Zone. The factory is also having its laundry capacity is complying with the present style and fashion in the world market. In addition, there is a child care center for the employees in the same building. The factory is claimed to be the largest cap manufacturing unit in the world. The company is a fully export-oriented garment producer with 1800 employees (see the organization chart in Figure 1). It is one of the largest companies which can produce embroidery work by using highly computerized embroidery machines. DADA makes all kinds of headwear of different styles and designs from a large variety of materials (fabrics). The common styles are all American sports league caps (NBA, MLB, NFL, NHL, NCAA, College leagues, MLS etc.), 5/6 panels basic base ball caps with or without embroidery, multi-panel caps, wrap round caps, golf visor caps, 3-D embroidered (lofted) caps, caps with patches etc. The production capacity is 25,000 pieces (approximately) caps per day.DADA has a world wide large market for its products. It is in very close business relationship with almost all the big buyers throughout the world. Some of the big buyers of DADA are Nike Team Sports Inc,. AJD Cap Corporation, Reebok International (USA), Wal-Mart, Stores Inc., Tommy Hilfiger and Logo 7. The buyers from European market include Nutmeg Limited, Oky Doky, Reebok International (Belgium). Other than these buyers, some of the regular buyers in the USA, Japan and Europe are American Needle and Novelty Inc., Headmaster Manufacturing Inc., Shinjin, Grossman Cap Co. Inc., Chavin, Drew Pearson, Twins Enterprises (USA); Otha, Kurihara, Sunrex Co. (Japan) and M&B (Spain).

REASONS FOR THE TRANSITION

DADA (Savar) Ltd. operated very successfully until it found itself in direct competition with other manufacturer of headwear. A review of the company manufacturing identified inefficiencies and high cost of production, as well as involvement with several waste such as high level of inventory, over transportation, unnecessary processing etc. led the company to bring changes in its existing production system.For example, it took 4 weeks to complete an order from raw materials to manufacturing and its standard time to accomplish a product was minimum 1 hour. Its delivery time of product to the customer was also very high. All these were demanding some kind of changes.DADA (Savar)'s

journey towards becoming a lean manufacturer started in 2003 and since then it has progressively introduced a variety of lean production techniques and philosophies, resulting improvement in all areas of its manufacturing operations. The lean journey of the company started involving with an Indonesian Project (motivation from one buyer-Addidas).

Figure 1: Organization Chart



IMPROVEMENT THROUGH LEAN PRODUCTION

With the assistance from both parent and customer company DADA (Savar) first introduced changes in the traditional business pattern. The company brought changes in product design, supplier networks and also in the manufacturing process. Through implementing various tools of lean such as JIT (Just-in-Time), Small Lot Size, Equipment Layout, Application of Preventive Maintenance, Pull Production and Quality Control, DADA (Savar) achieved improvements in various areas of the production process. By 2007, the company minimized machine changeover time up to 20 minutes, as well as reduced delivery time at 45 days (Table 1). These were achieved through training to the employees. Kanban is a very important element of lean, which it aims to introduce in the future. The above changes and use of different lean tools reduced the average number of days of inventory from 120 days to 90 days. The company achieved substantial improvements over the five years period in all areas through the reduction of lead time. The company reduced lead-time from 40 days to 25 days. The benefits of the company were substantial, such as overall quality improvement 40 to 60 percent and on an average had 40% increase of overall productivity. The company was also minimized various types of wastes successfully.

Table 1: Improvement Through Lean Production

Areas of Improvement	Before Lean	After Lean
Machine Changeover Time	30 Minutes	Up to 20 minutes
Delivery Time	60 days	45 days
Average Number of Days of Inventory	120 days	90 days
of Inventory		
Quality Improvement	-	40% to 60%
Productivity	-	40%
Number of C ap per Labor Hour	3 Unit	5 Units
Number of Hat per Labor	2 Unit	4 Units
Hour	$ 11(1 Unit)	9(1 Unit)
Reduced Labor Hour		40 Lac (4 million)
Lead Time	40 days	25 days
Waste	Everywhere	Minimized
Unit Production Cost	$1.40	$1.30

FACTORS MOTIVATED TO PRACTICE LEAN

Organizations need to be motivated to bring any change initiatives. The company was first get motivated from the parent company to bring changes in the manufacturing process. In addition to this several factors motivated DADA to practice lean such as:

(a) Make the products highly competitive in the market
(b) Expand the market share in the industry
(c) Reduce the manufacturing cost and
(d) Minimize waste through eliminating non-value added activity

PROBLEMS AND DIFFICULTIES FACED BY DURING LEAN IMPLEMENTATION

DADA had to overcome a number of problems and difficulties in implementing lean system successfully. DADA was faced with and had to overcome the following difficulties:

(a) Strong resistance from shop floor personnel.
(b) Providing training to the employees on lean related issues, which increased cost through consultancy fees.
(c) Rearranging the manufacturing process, this was involved in additional investment as well as effort.
(d) Traffic problems in bringing raw materials from Dhaka city, which sometimes cause delay in production.

The Company believes that proper training and education can bring success for any organization because training is the foundation of any change initiative.

BENEFITS DERIVED FROM LEAN PRACTICES

When other companies throughout the worlds are reaping several benefits DADA (Savar) also achieved the following benefits from the implementation of lean. These are as follows:

(a) Reduced order processing errors and paper works in office areas
(b) Streamlined the customer service functions
(c) Reduced staff demand
(d) Increased revenue
(e) Increased sales, profits as well as reduced manufacturing cost, number of workers and other costs

In addition to the above mentioned benefits the company also experienced some other improvements. Before lean, the

number of Cap per labor hour was 3 units, which is now 5 units (Table 1), and number of Hat per labor hour was 2, which is now 4. DADA also reduced unit production cost from $11 to $9 and total savings made through reducing the labor over the last 12 months period was 40 lac (Taka) or 4 million dollar (Table 1).

MANAGEMENT PRACTICES FOLLOWED BY DADA (SAVAR) LIMITED

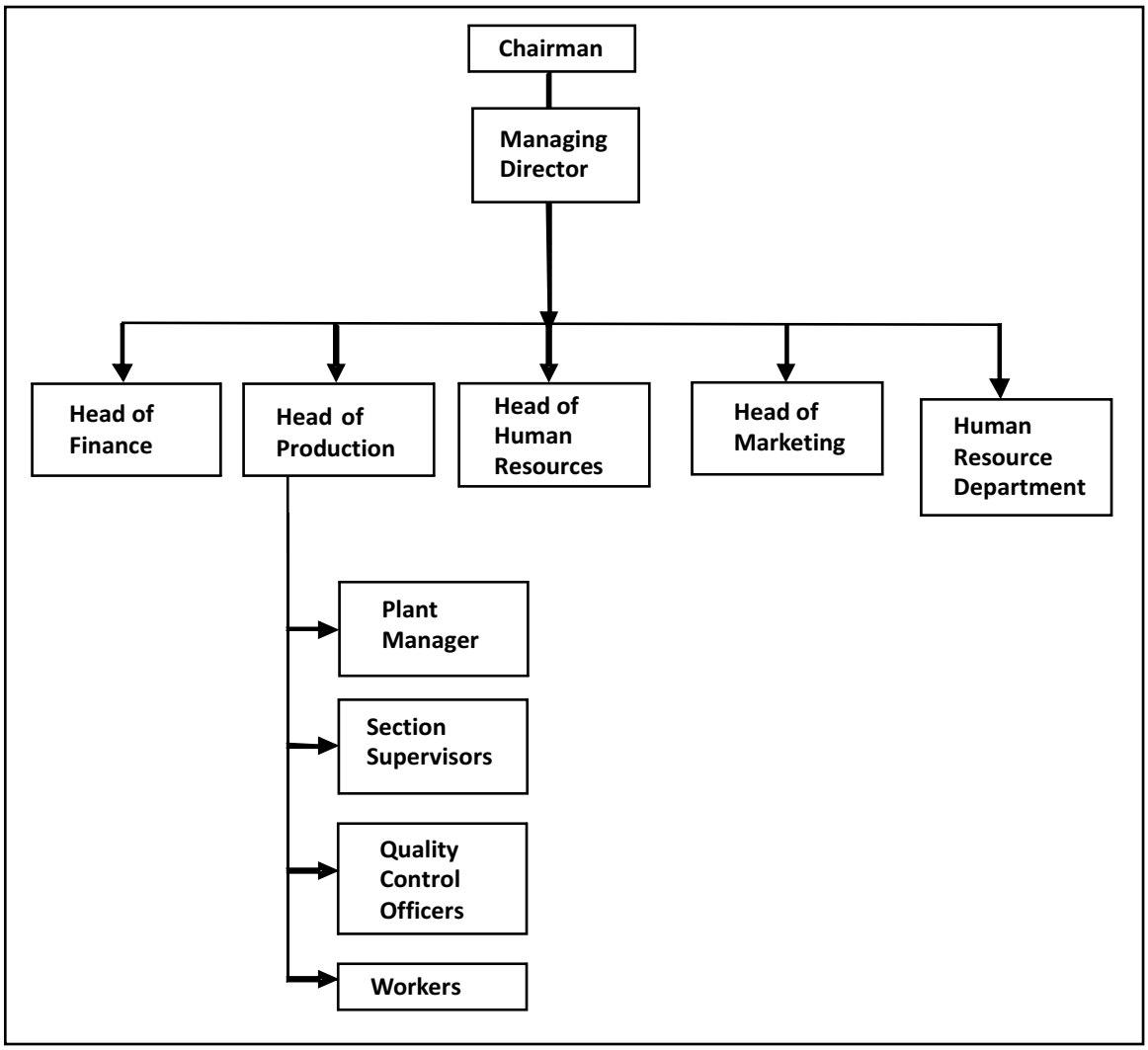
Like the Japanese factories, DADA has a clean orderly work place, minimum inventory, and proper monitoring systems. It always focused on continuous improvement, workforce training, and maintained standard machinery. Several changes took place during the lean implementation. The company brought changes in its culture such as in leadership pattern and work team as well as in manufacturing process and product design.

PROFILE OF THE ORGANIZATION

COMPANY 2

Employing 397 people in Gazipur, Bangladesh, it manufactures readymade garments such as T-shirt, polo shirt, sweat shirt, Tank Top, Fleece Jacket etc. It was established in 2000. In early 2002, Fashion Point was losing order and was on under high pressure from all key customers to improve cost and performance. During that time the 9/11 incident exert a great impact on Bangladeshi firms.

Figure 2: Organizational Chart



In early period Fashion Point was not that disciplined and systematic. The market demand and manufacturing process of the company were reviewed and identified the need for more fashionable items and involvement with several types of waste.In order to get rid of the situation, the company introduced lean production concept in 2002. Pressure from both government and buyer, influenced them to practice lean. Since then the company has adopted a wide range of lean techniques such as Kanban System, Small Lot Size, JIT, Pull Production, 3P, 5S, QC, Kaizen, and Equipment Layout etc. The company introduced lean with the help of BGMEA (Bangladesh Garment Manufacturing and Export Association).

IMPROVEMENTS THROUGH LEAN PRACTICE

The Fashion Point first started its lean journey by adopting employee training. The company primarily focused on the reduction of various sorts of waste involved in the production process. A Kanban system of production control was implemented. The company only uses the electronic media such as Fax, e-mail in its Kanban process. From Table 2 it is revealed that the company reduced 42.85% of its inventory holding time through JIT receive of raw materials and JIT delivery of products. Within the period of five years the company improved in several areas and became more disciplined and systematic than before. The productivity and quality improved up to 40 to 60 percent. Its proper layout of equipment also significantly reduced machine changeover time at 1.5 hours. With a view to improving performance the company successfully reduced 50 % of lead time which in turn reduced the order to ship cycle time from 30 days to 15 days. In addition to these, the company made TK. 6- 8 lac savings through the reduction of labor content over the last 12 months period.

Table 2 : Areas Of Improvement Through Lean Production Practice

Areas of Improvement	Before Lean	After Lean
Machine Changeover Time	3 hours	Up to 1.5 hours (Reduced)
Delivery Time	30 Days	15 Days
Productivity		40% to 60%
Quality Improvement		40%to 60%
Average Number of Days of	120 days	90 Days
Inventory	3 Unit	5 Units
Savings		6-8 Lac
Lead Time	30 days	15 days
Waste	Everywhere	Minimize d
Unit Production Cost	$8.50	$7.00

FACTORS MOTIVATED TO PRACTICE LEAN

The company realized one thing that traditional business setting will not work in lean environment. Several changes are required to be a lean enterprise. It experienced several changes during the transformation process. It had to develop more skilled manpower and organization wide commitment through training. The company brought changes in other areas of the organization such as in product design, manufacturing processes, supplier networks, and Factory management.Facing competition and making products highly competitive in the market was the starting point of practicing lean in the company. Other factors such as reduction of manufacturing cost and the elimination of non-value added activities were also motivated it to practice lean production system.

PROBLEMS AND DIFFICULTIES FACED BY THE COMPANY

Any kind of transformation is a difficult process. Fashion Point had to face several difficulties to attain the current position. The problems faced by the company are as follows:

(a) Political unrest causing late delivery highly de-motivates foreign investors.

(b) Power supply problem interrupt in the normal production schedule.
(c) Port problems also sometimes increased the lead -time to delivery.
(d) Restrictions on access of heavy vehicles into Dhaka city and heavy traffic problem also slowdown the product movement process.

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BENEFITS DERIVED FROM LEAN PRACTICES

Lean practice improved the overall manufacturing performance of the company. It reduced the order processing errors, paperwork as well as improved the customer service and also reduced the staff demand. Since 2002, it also gained increase in sales, profits and reduction of manufacturing cost, number of workers as well as other costs.With a large variety of lean techniques Fashion Point had transformed itself to a lean organization. The major reason behind the success of Fashion Point is its clean and orderly workplace. It has significantly minimized the level of inventory and all forms of waste. Continuous improvement was a general practice of the company and always emphasizing on quality into design. It maintained standard machinery and had excellent material handling. It aims to introduce more lean tools in future and is interested to undertake benchmarking program like the successful companies of the world.

CONCLUSION

Facing the competitive challenges of globalization, manufacturers must now look past their own organization and adopt a wider perspective of analyzing competitive advantages and identifying opportunities on a supply chain level. Lean has gone way beyond the factory walls and now encompasses all aspects of business in effect extending itself across the entire enterprise. Both the companies in this study are excellent example of organizations those adopted a variety of lean production concepts. The structure of the companies changed dramatically over the last 5 years. As a result, the companies became more profitable, and more competitive and more successful. For future development the companies also aims to practice other lean related techniques and also highly interested to undertake benchmark survey.

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