

Scenario of Implementation of Lean Six-Sigma in Ready-made Garment Manufacturing Industry of Bangladesh

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Abstract

Lean and Six-sigma are well implemented in different countries but it is yet to find the implementation scenario in ready-made garment industry of Bangladesh. RMG growth in Bangladesh is for day-to-day learnings only. This research work is on finding the current scenario of structured implementation of Lean and Six-Sigma in RMG industry of Bangladesh. A survey is conducted on industrial engineers and management employees covering 270 factories of Bangladesh RMG industry. The results found that only 8.5% of the industries have implemented Lean Six-Sigma up to some extent and major 91.5% industry yet not implemented any of these. The theoretical and practical knowledge level of structured Lean and Six-Sigma is identified as staff of 85% factory have below 25% knowledge level, staff of 15% factory have 25%-50% knowledge level and none of the factory staff have above 50% knowledge on Lean Six-Sigma. The challenge of implementation of Lean Six-Sigma are lack of training and knowledge, costly training programs, believe of the benefit of training and development, improper data records, not encouraging analytical activity, failure of transforming data to information etc. However, such findings will help to understand the current scenario and improvement areas for this industry.

Keywords: Implementation Scenario, Lean Six-sigma, Ready-made Garment Industry.

1. Introduction

In 19th century, industrialization began around the central Europe which was gradually spread towards Asia. Lean manufacturing strategy developed in 1950s by Taiichi Ohno of Toyota Motor Company. It's a conceptual framework which got in many western industries since early 1990s. Thereinafter, it was studied in other industries. It can be defined as a systematic approach to identify and eliminate waste through continuous improvement by flowing product at the demand of the customer. Six Sigma framework was developed at Motorola in 1970's as a response to their poor product quality. In 1986 an improvement organization was launched with a clear infrastructure, common problem-solving techniques and education, the improvement organization was named Six Sigma. Motorola formed the model behind Six Sigma using standard deviation from statistical theory. In the era of quality management, customer wants a defects free product or service. Six-Sigma is a quality improvement approach that aims to reduce the number of defects. With the extreme competition and facing challenges day by day in the international business market, Bangladesh garments industry is in a battle. This sector is searching for ways to cost reduction and improve performance to ensure the survival.

1.1 Problem Statement

In this situation of optimizing cost and waste, it is required to find out the current status of implementation of Lean and Six-sigma in this industry. Real scenario of Lean or Six-Sigma implementation yet not researched in Bangladesh to that stand.

1.2 Objectives

The objective is to find the real scenario of Lean Six-Sigma Implementation in Bangladesh Ready-made Garment Industry which will help to take more effective step on the development in this sector.

2. Literature Review

The Bangladesh Garment Manufacturers and Exporters Association BGMEA (2018) stated in website that, apparel industry is the single biggest earning sectors of Bangladesh, has contributed \$30.61 billion which is 83.49% to total exports of \$36.67 billion in the FY2017-18, which was 3.89% in 1983-84. After starting with 384 factories in 1984-85, number of factories increase per year was 64 till 1990-91, 256 till 2000-01 and 167 till 2010-11, but after that decrease per year are 66 till 2017-18. According to Chandrakala and Sridhar (2015), poor participation of employee, lack of training and knowledge, internal resistance from the middle management, lack of resources, commitment from the top management etc. are the key factor for successful implementation of Lean Sigma. Timans et al. (2012) highlighted high cost of training and certain time requirements to implement for visible results as key obstacles to deploy Six Sigma. Long time and investment on training and development is yet to get importance in this industry for Bangladesh. Chaurasia et al. (2016) explained that, switching from traditional processes to Lean Six Sigma processes signify generation of revenues, customer and employee satisfaction, increased productivity, reduced waste, improved quality and low cost. Laureani and Antony (2012) explained that Lean Six-Sigma methodology aims to improve capability in an organization, reduce production costs and maximize the value for shareholders by improving quality. However, not all organizations have gained real benefits from Lean Six-Sigma as unsuccessful implementation rendered it ineffective. Arota and Pacheco (2017) shown in survey that, companies who have adopted the principles of these methodologies helps to improvements of up to 90% reduction of cycle time and increases of 80% in the final quality of the product.

3. Methodology

Methodology applied here is a questionnaire survey which is conducted on industrial engineers and top management employees of different ready-made garments factories in 2020. Data are collected from those resource personnel from Bangladesh specially Dhaka and Chittagong.

4. Data Collection & Survey

To find the current scenario of the implementation of lean six-sigma, in this research work, a survey is conducted on 40 industrial engineers and top management employees of covering 270 factory of Bangladesh RMG industry. Three questionnaires are asked in this survey work and status of structured implementation is found as below.

	Factory	%	Factory	%
Structured Implementation	23	8.5%	Below 25%	230
No Implementation	247	91.5%	25% to 50%	40
Total Factory -	270	100%	51% to 75%	0
			Above 75%	0
			Total -	270
				100%

Name of Participants	Management Type	SURVEY Q. 01	SURVEY Q. 02	SURVEY Q. 03	Name of Participants	Management Type	SURVEY Q. 01	SURVEY Q. 02	SURVEY Q. 03
Mr. Mustainur	Top	10	2	Below 25%	Mr. Rahat	Mid	4	0	Below 25%
Mr. Mohiuddin	Top	50	4	Below 25%	Mr. Masud	Mid	4	0	25% to 50%
Mr. Shahiduzzaman	Top	35	6	Below 25%	Mr. Ahsan	Mid	4	0	Below 25%
Mr. Faisal Pervez	Top	3	1	Below 25%	Mr. Sharif	Mid	4	0	Below 25%
Mrs. Tania	Top	20	2	Below 25%	Mr. Babor	Mid	3	1	25% to 50%
Mr. Muzahid	Top	8	0	25% to 50%	Mr. Hamid	Mid	3	1	25% to 50%
Mr. Asif	Mid	10	0	Below 25%	Mr. Fazlul	Mid	3	0	Below 25%
Mr. Sanjay Sen	Mid	8	1	25% to 50%	Mr. Imran	Mid	3	0	Below 25%
Mr. Navid	Mid	6	0	Below 25%	Mr. Babul	Mid	3	0	Below 25%
Mr. Anik	Mid	3	0	Below 25%	Mr. Maruf	Mid	2	1	25% to 50%
Mr. Rintu	Mid	4	1	Below 25%	Mr. Salam	Mid	2	1	25% to 50%
Mr. Nur Akter	Mid	10	0	25% to 50%	Mr. Shafiq	Mid	2	0	Below 25%
Mr. Shanjoy	Mid	8	0	Below 25%	Mr. Zafor	Mid	2	0	Below 25%
Mr. Abu Jied	Mid	8	0	Below 25%	Mr. Shagor	Mid	2	0	Below 25%
Mr. Siddiq	Mid	8	0	Below 25%	Mr. Rahat	Mid	2	0	Below 25%
Mr. Salah	Mid	8	1	Below 25%	Mr. Moshiur	Mid	2	0	Below 25%
Mr. Rahman	Mid	7	0	Below 25%	Mr. Souman	Mid	1	0	Below 25%
Mr. Mamun	Mid	6	1	Below 25%	Mr. Dipta	Mid	1	0	Below 25%
Mr. Saddam	Mid	5	0	Below 25%	Mr. Tushar	Mid	1	0	Below 25%
Mr. Maruf	Mid	4	0	Below 25%	Mr. Selim	Mid	1	0	Below 25%
					Grand Total -		270	23	

Figure 1: Survey Brief on Lean Six-Sigma Implementation in Bangladesh

Questions asked are:

1. In Bangladesh, how many Garments factories you have worked for or you had gained opportunity to acknowledge about?
2. From those factories, how many of them have implemented Lean or Six-Sigma in a structured approach?
3. According to your observation, what is the theoretical and practical knowledge level of Lean and Six-Sigma among the employees specially staff level? - Below 25%, 25 to 50%, 50 to 75%, Above 75%.

During these question answer sessions, a discussion was made about the scenario to get in depth status.

5. Results and Findings

From the survey, it is found that only 8.5% of the industries have implemented up to some extent and major 91.5% industry yet not implemented any of these lean or six sigma. Here is the scenario that this sector is struggling on the implementation of improvement initiatives for cost cutting and waste reduction.

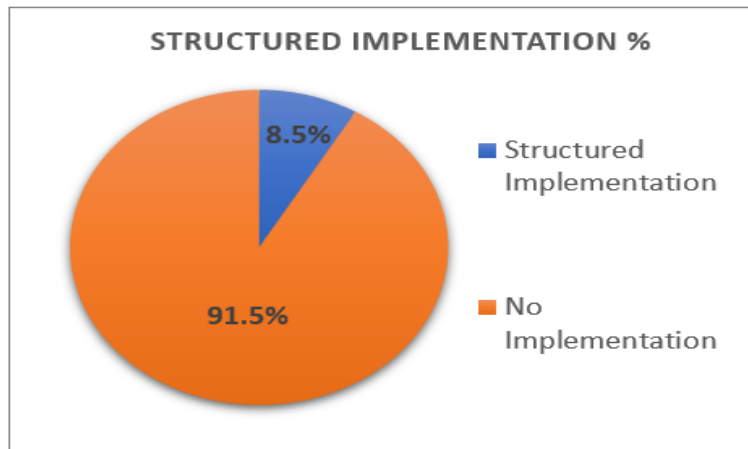


Figure 2: Implementation % of Lean Six-Sigma

Also, other findings came out that, the knowledge level of the management on structured implementation is not up to the level. The theoretical and practical knowledge level of structured Lean and Six-Sigma among the staff employees- Staff of 85% factory have below 25% knowledge level, Staff of 15% factory have below 25%-50% knowledge level and none of the factory staff have above 50% knowledge on Lean Six-Sigma.

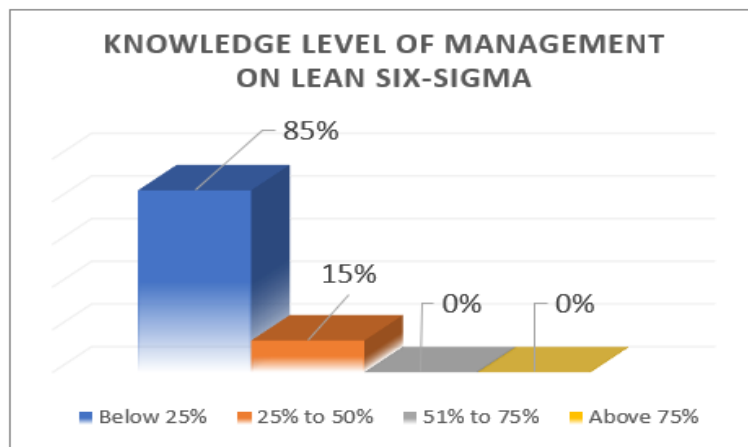


Figure 3: Knowledge level on Lean Six-Sigma

Summary Result achieved with the survey are –

- Lean or Six-Sigma Implementation – Implemented 8.5% industry, Not yet implemented 91.5% industry.
- Knowledge level of the management –Staff of 85% factory have below 25% knowledge level, Staff of 15% factory have below 25%-50% knowledge level and none of the factory staff have above 50% knowledge on Lean Six-Sigma.

6. Discussion and Conclusion

6.1 Discussion

A scenario is identified through this research work and survey on the structured implementation level of Lean and Six-Sigma in ready-made garment industry of Bangladesh. Also, the theoretical and practical knowledge level is identified to find out the key area of improvement. A survey is conducted on 40 industrial engineers and top management employees of covering 270 factory of Bangladesh RMG industry and it is found that few factories in Bangladesh implemented Lean Six-sigma in structured way and gained benefit of it. Also, the staff knowledge level on lean six-sigma is obtained very poor. This is the scenario demanded the research work in this area. The challenge of implementation of such initiatives are lack of training and knowledge, costly training programs, believe of the benefit of training and development, improper data records, not encouraging analytical activity, failure of transforming data to information etc. Improvement doesn't sustain until employee participates, until middle management resistance is broken, until it is owned and driven by top management rather than tendency of assigning a team and demanding. It is essential of fundamental change in organization's culture and way of stakeholders' thinking too.

6.2 Conclusion

It is obvious that, Bangladesh is far behind on effective implementation than the other competitors. Neither Lean manufacturing ideology nor Six-Sigma strategy has been well implemented in any appeal industry in Bangladesh, even the knowledge level is also very low in the management employees. Practices of implementation are increasing day by day in very slow speed. Most RMG industries are shutting down day by day due to cost increase and price drop trend. RMG industries are gradually practicing this but the fact is almost majority of these industries are not acknowledged about these implementation procedures. They are not willing to invest on training and development but only expects faster outcome which is a real challenge of implementation. Industries are yet not practicing sustainable initiative for continuous development in culture and improvement

6.3 Limitations and Future Scopes

This survey is conducted to covering 270 factories, if it could have done for more factories, results could have been more accurate. As the implementation percentage is too less and knowledge level is also too low, a structured approach can improve this industry and can help this industry to overcome the challenges.

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Biography

Shanjoy Chowdhury is currently working as a Manager of the Department of Production Planning and Coordination in a multinational RMG manufacturing company named EPIC Group, where he experienced in production planning, ERP software, supply chain and logistics etc. He also worked as a Manager of the Department of Business Process Excellence in the same organization where he practiced lean manufacturing, system development, automation, standard operating procedure, improvement projects, resource optimization etc. He received the degree B. Sc. And M.Sc. in Industrial and Production Engineering from the Department of Industrial and Production Engineering (IPE) of Rajshahi University of Engineering and Technology (RUET), Rajshahi. He has certification on Lean Six Sigma Black Belt (LSSBB) and Lean Six Sigma Green Belt (LSSGB) from Beingcert & Bangladesh IT Institute under the workforce development training of Bangladesh ICT Division, Hi-tech Park Authority. Furthermore, he has published two International Conference papers in 6th International Mechanical Engineering Conference & 14th Annual Paper Meet, The Institute of Engineers, Bangladesh (IEB), Dhaka and 7th International Conference on Integrated Solid Waste & Faecal Sludge Management: Blue Appropriate Social Oriented Solutions, Khulna, Bangladesh.

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