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# The Role of Total Quality Management in Textile Industry

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**Abstract.** Defective or returned items, low value products, unnecessary scraps, and improper chemical disposal are the primary contributors and indications of poor quality in the country's textile manufacturing industry. Therefore, the present study aims to analyse the role of total quality management in textile industry. The current study has used explanatory research due to its dimensions of the pre-existing phenomenon of total quality management, market orientation and visibility to operational and market performance with the inclusion of agile and lean strategies. The study has used a five-point Likert Scale questionnaire, whereas measures of all the latent variables were adapted from various past studies. The study has considered the textile industry of the UK as a target population. The results proved that both lean and agile strategies significantly influenced by market orientation, total quality management and lastly by supply chain visibility. In the similar context, lean strategy significantly influences market performance and operational performance. However, agile strategy also found statistically significant in relation to market performance and operational performance. The textile industry should have a deliberate focus on lean and agile operations and strategies for effective performance inclination.

**Keywords:** Supply Chain, Total Quality Management, Textile industry, UK

## 1. Introduction

There is a gradual increase in the demands and needs of customers in the twenty-first century because of the increased requirement for improved quality of products and services in the global competitive market, considering particular specifications such as cost-effective and responsive service providers [1]. It is believed that organisational functions and business activities can be improved by implementing TQM as a management process.

Over the past few years, the textile sector has demonstrated dynamic and competitive behaviour to meet market needs. The cultural and geographic closeness to the market in Europe, several investments in technological modernisation, growth of international product recognition, and the developing quality culture are some of the advantages of strengths of TQM [2]. The textile industry manufacturers consider the TQM one of the best methods for meeting the dual demands of competition and quality; nevertheless, many organisations are having difficulty maintaining their TQM adoption choice [3].

Quality has been highlighted as a strategic component that adds value. Furthermore, the added value created during quality improvement activities is regarded as a tool for

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regulating market share, coordinating and meeting the demands of stakeholders, and reaping economic benefits [4]. Customer-oriented quality meets consumers' requirements and expectations while emphasising appropriateness for usage. All of this occurs while protecting environmental concerns, as new business models emerge with new digital technologies to enhance the quality of life [9].

Achieving world-class quality is not a one-time event; it is a continuous effort. A company uses TQM as a long-term strategy for achieving customer satisfaction. TQM necessitates the participation of all employees in order to improve the organisation's goods, processes, and services [3]. Previous studies have revealed that management systems like safety and environment integrated with quality are beneficial for the company, as well as for the stakeholders as it enhances sustainable development of the company [6]. Defective or returned items, low-value products, unnecessary scraps, and improper chemical disposal are the primary contributors and indications of poor quality in the country's textile manufacturing industry. As a result, improving product quality must become one of the developing challenges in the textile manufacturing sub-sector in order to increase competitiveness. The difficulties that contributed significantly to the aforementioned series of quality problems in the industry may be minimised by using a suitable quality management method, such as TQM. Therefore, the present study aims to analyse the role of TQM in textile industry.

## **2. Literature Review**

Total Quality Management (TQM) Development in the 1980s, American companies faced stiff competition from their Japanese counterparts in the world market. The formal origins of quality management can be traced back. Other statisticians have built on his work. TQM's roots can also be traced back to the Japanese community of scientists and engineers [7]. A look at how Japanese workers feel about "Master" quality management in the workplace.

### *2.1. Defining TQM*

There have been thousands of articles on TQM in recent decades, but no universal definition has yet been found. Argue that the purpose of TQM is, and it is not actual reality, but an amorphous philosophy that managers, consultants, and researchers continue to put forth, in which decisions are based not only on their understanding of TQM principles but also on their awareness. The scope of this management technique appears to be agreed upon in the literature. They argue that "quality is not a narrow engineering or production-related technology, but a new role that permeates every aspect of a company's operations" and agrees with Mgendera. Likewise, TQM defines as a method of increasing an organisation's competitiveness, efficiency and flexibility [8].

### *2.2. Organisational Performance and TQM*

The topic that has to be addressed right now is whether TQM can truly assist businesses in improving value, yield, customer satisfaction, and profitability. This section looks at the primary literature that examines the association between TQM and organisational progress. Leading quality researchers support a positive relationship between a quality application and overall organisational performance. Similar success stories from other production businesses were also mentioned. For example, some previous studies provided experience from 602 high-quality award-winning firms in the United States,

showing that the impact of TQM deployment on organisational performance is significant [9].

TQM procedures have a beneficial influence on financial performance, according to empirical evidence from US hospitals provided by Shafiq et al. [7]. It is pointed out that a common approach to quality management is essential and positively impacting the quality of products and revolution. They gather information from Australian service centres and development firms. To obtain genuine benefits from TQM implementation, organisation must be patient. The above studies conclude that the connection between TQM and different dimensions of organizational performance (OP) is unsatisfactory, and further experimental studies are needed to investigate further this relationship [7]. Similarly, some researchers point to the need to look at the connection between overall QM and overall organisational performance in another context. Imran et al. [10] mention that it is necessary to use a complex quality performance model with all relevant variables and relationships to explore how the model relates to different contexts to gain a deeper understanding of the impact of TQM on performance.

The study also showed a similar trend. In South Asian countries, including Pakistan, Bangladesh and Sri Lanka, there are smaller studies examining the relationship between overall TQM methods and different organisational performance. Singh et al [11] showed that some international research had been done, but this is an important area for further investigation.

### *2.3 Implementation of Quality Improvement Initiatives in the Textile Industry*

In England, Wales, and Scotland, the fashion and textile industry has employed 500,000 individuals, which make up to 88,000 in manufacturing followed by 62,000 in wholesale, and 413,000 in retail. In totality, approximately 34000 businesses are currently operating in the UK fashion and textile industry within manufacturing, retail, and wholesale regions. The industry is regarded as the country's economic backbone. The colour, lustre, gloss and uniformity are also good. Because most of the world's production currently takes place over medium and long distances, Asian countries can confidently enter this market. The primary demand for such goods is in the third world. This could be one of the areas where textile industry can make progress in the future [7]. The elimination of the quota system, on the other hand, sparked open and robust competition in the worldwide market. This could explain why these organisations cannot compete with South Asian nations in terms of consistency, prompt delivery, innovation, reliability and quality of products and services.

These studies offer relatively little insight into the overall degree of “quality management” and its impact on organisational progress. This study provides a strong argument for using a standard quality management approach to achieve the promised results. However, researchers could not offer a model for the association between a TQM approach and overall organisational performance. Hence, this learning aims to bridge the gap in the current TQM literature by offering experience on the connection between TQM and corporate presentation in underdeveloped textile industries in various countries leading to development. This research will help professionals and strategists expand their knowledge base in the practical application of total quality management [10].

Many studies measure performance based solely on financial metrics such as market share and profitability. These findings do not focus on non-financial results like customer satisfaction, process improvements, employee happiness or community performance. Shafiq et al. [7] stated that traditional accounting metrics, like return on investment and earnings per share, can be misleading for the overall performance of organisational units.

It has been manifested in past literature that visibility in the supply chain or amongst supply chain partners and member can be achieved by internal and external integration. Therefore, the following hypotheses have been developed:

*H1a: External integration has a significant influence on visibility.*

*H1b: Internal integration has a significant influence on visibility.*

Moreover, market orientation was also emphasised in the past literature as an important strategy and focused viewpoint of the organisation for the effective supply chain management. In this concern, it has been manifested that market orientation leads to gauging customer needs and desires in an appropriate manner [4, 5]. Similar to this context, the focused strategies for accommodating market needs and coping with the dynamics lead to flexible, cost-effective, timely and responsive supply chain management. Therefore, the following hypotheses have been established on the theoretical and empirical foundations.

*H2a: Market orientation has a significant influence on lean strategy.*

*H2b: Market orientation has a significant influence on agile strategy.*

Quality is one of the important areas in supply chain management and fulfilling market demands. Also, lean and agile strategies are core to gaining performance while total quality management is one of the basic ingredients to lean and agile strategies implementation. Another study proved that total quality management has a significant influence on the implementation of lean and agile strategies. Hence, the study has developed the following hypotheses.

*H3a: Total quality management has a significant influence on lean strategy.*

*H3b: Total quality management has a significant influence on agile strategy.*

Visibility does have implications and importance in effective supply chain management. It has been empirically proven in numerous studies. These studies showed empirically that supply chain integration leads to a higher extent of visibility in the entire supply chain. Ultimately, it affects the optimum implementation of lean and agile supply chain strategies. Hence, the study has hypothesised as follows.

*H4a: Visibility has a significant influence on lean strategy.*

*H4b: Visibility has a significant influence on agile strategy.*

*H5a: Lean strategy has a significant influence on operational performance.*

*H5b: Lean strategy has a significant influence on market performance.*

*H6a: Agile strategy has a significant influence on operational performance.*

*H6b: Agile strategy has a significant influence on market performance.*

#### *2.4 Conceptual Framework*

Figure 1 illustrates the conceptual framework of the present study and provides portray of the proposed research model.

### **3. Research Methodology**

There are two types of research purposes: explanatory and exploratory. The exploratory purpose emphasises upon the discovery and investigation of such a phenomenon or event that has not either gained much attention or it has never been highlighted in the real world scenario. On the other side, the explanatory research purpose tries to examine existing phenomena or processes for further understanding and underscored concepts. The current study has used explanatory research purpose due to its dimensions of the pre-existing phenomenon of TQM, market orientation and visibility to operational and

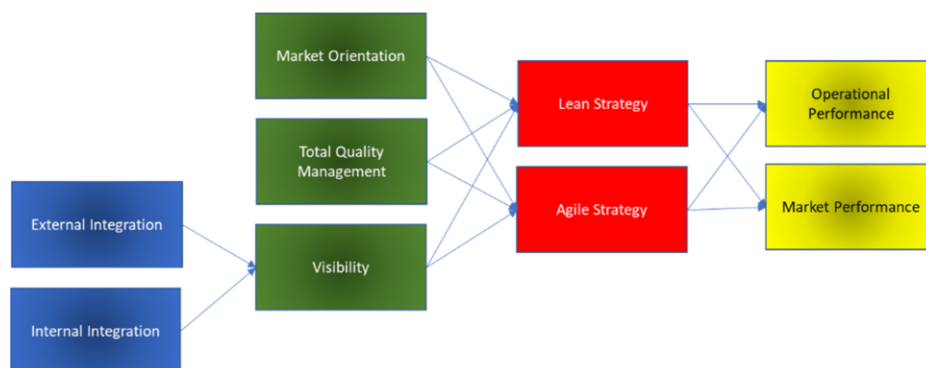


Figure 1: Conceptual Framework

market performance with the inclusion of agile and lean strategies. In the current study, the data has been personally collected first time from the target population, therefore, primary data sources have been used for data collection. The study has used a five-point Likert Scale questionnaire, whereas measures of all the latent variables were adapted from various past studies. The study has considered the textile industry of the UK as a target population. The textile companies were taken into account for data collection. The respondents that participated in the study were supply chain managers, deputy managers and assistant managers that have shown their willingness and consent to participate in the study.

Based on the statistical formula for sample size estimation i.e.  $N/10$  where  $N$  is the total number of variables in the structural model. The current study has total eight variables in the model (See figure 1), and therefore, minimum 80 responses were required to analyse the phenomenon empirically. However, it has been manage to collect 242 valid responses from target population to examine the proposed phenomenon and provide conclusive remarks and findings for practical implications.

In regards to the data analysis technique, the study has developed a complex and multi-layered conceptual framework using a comparatively smaller sample size. Therefore, Partial Least Square (PLS) Structural Equation Modelling (SEM) has been used in the study. It was described rigorously by numerous past statisticians that PLS-SEM has considerable advantages in assessing exploratory models with smaller sample size. Basically, PLS-SEM is a non-parametric statistical technique that emphasise upon bootstrapping and algorithm to estimate confirmatory factor analysis and path analysis to provide findings. Hence, the study has purposefully used PLS-SEM as a data analysis technique.

#### 4. Results

It has been manage to collect 242 responses. However, a total of five univariate and seven multivariate outliers were detected in the dataset. Table 1 shows descriptive statistics of the 242 sample responses. These descriptive statistics basically show the participants' bifurcation into their professional characteristics.

Table 1: Descriptive Statistics (n = 242)

		Frequency	Percent
<b>Firm Type</b>	Large Enterprise	115	47.5
	Small & Medium Enterprise	127	52.5
<b>Qualification</b>	Intermediate	25	10.3
	Bachelors	23	9.5
	Masters	96	39.7
	Others	98	40.5
<b>Firm Size</b>	1 to 99 employees	37	15.3
	100 to 200 employees	155	64.0
	201 to 500 employees	35	14.5
	500 employees or above	15	6.2
<b>Firm Category</b>	Public Sector Organizations	118	48.8
	Private Organisation	124	51.2

From Table 2, it is clear that lean strategy (0.654,  $p < 0.10$ ) and agile strategy (0.131,  $p < 0.10$ ) significantly influenced by market orientation. Similarly, lean strategy (0.130,  $p < 0.10$ ) and agile strategy (0.528,  $p < 0.10$ ) significantly influenced by total quality management and lastly, lean strategy (0.160,  $p < 0.10$ ) and agile strategy (0.192,  $p < 0.10$ ) significantly influenced by supply chain visibility. In the similar context, lean strategy significantly influences market performance (0.101,  $p < 0.10$ ) and operational performance (0.140,  $p < 0.10$ ). However, agile strategy also found statistically significant in relation to market performance (0.283,  $p < 0.10$ ) and operational performance (0.318,  $p < 0.10$ ).

Table 2: Hypothesis-Testing using SEM

	Estimate	S.E.	T-Stats	Prob.
<b>Market Orientation → Lean Strategy</b>	0.654	0.038	17.094	0.000
<b>Market Orientation → Agile Strategy</b>	0.131	0.059	2.236	0.025
<b>Total Quality Management → Lean Strategy</b>	0.130	0.050	2.619	0.009
<b>Total Quality Management → Agile Strategy</b>	0.528	0.052	10.134	0.000
<b>Visibility → Lean Strategy</b>	0.160	0.050	3.199	0.001
<b>Visibility → Agile Strategy</b>	0.192	0.062	3.099	0.002
<b>Lean Strategy → Market Performance</b>	0.101	0.060	1.676	0.094
<b>Lean Strategy → Operational Performance</b>	0.140	0.072	1.954	0.051
<b>Agile Strategy → Market Performance</b>	0.283	0.060	4.682	0.000
<b>Agile Strategy → Operational Performance</b>	0.318	0.072	4.397	0.000

Due to space limitations, many other results, such as construct validity, convergent validity, discriminant validity and predictive relevancy, will be presented at the conference.

## 5. Conclusions

The study has aimed to identify the role of lean and agile strategies for improving market performance and operational performance of the textile industry. However, the study also emphasised the influence of market orientation, supply chain visibility and total quality management as factors for effective agile and lean strategy implementation. This study examines and analyses the implementation of TQM in clothing manufacturing. The study

also revealed a number of approaches that eventually led to the development of the TQM framework. TQM is not a destination, but but a journey that never ends. Companies are constantly trying to improve and different technologies and tools have invented to increase customer expectations. Therefore, the definition of quality is always evolving. Textile is a thriving industry and its growth is incredible. The continued development of TQM and the need to maintain a high growth rate are crucial.

Based on the results and findings of the current study, it has been manifested clearly that the textile industry should have a deliberate focus on lean and agile operations and strategies for effective performance inclination. Supply chain visibility does have a significant contribution to effective lean and agile strategy for the textile industry. Henceforth, it has been manifested categorically that the textile industry should focus on lean and agile strategies through market orientation, total quality management and supply chain visibility. The study concluded that market orientation has an important domain for textile industry to enrich its market and operational performance in a larger perspective.

Furthermore, the study also concluded that quality-focus and total quality management strategies should be emphasised largely for the textile industry to increase its performance and gain a competitive advantage in the larger perspective. The study further concluded that supply chain visibility can also help to enrich the performance elevation in the downstream and upstream supply chains of the textile industry.

It can be understood specifically that increasing trends of supply chain visibility ultimately emerge new venues for improvement and quality perspective of the entire supply chain. Therefore, the textile industry can gain beneficial perspectives and aspects to improve their entire supply chain to achieve better market and operational performance.

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