IMPACT OF BUSINESS PROCESS MANAGEMENT AND LEAN OPERATIONS ON COST OF QUALITY

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ABSTRACT

Business organizations are increasingly confronted with a variety of challenges in a world of intense globalization and digitalization, including rising costs, fierce competition, quickly advancing technologies, more demanding and unpredictable consumers, and, in social terms, shifting societal demands. The efficacy and efficiency of business organisation management are realized within this environment. This research is objected to study the previously investigated areas defining the relationship of cost of quality and business process management, the contemporary issue is to analyze lean operations impact on cost of quality to maintain business process management and cost effectiveness, and this research attempts to establish the relationship. Literature reviews and critical evaluation of the relevant scientific sources make up the research convenient.

Keywords: *Business Process Management, Lean Operations, Cost of Quality.*

1. INTRODUCTION

Combining business process management (BPM) and Lean operations is one of the most effective strategies to boost organizational performance and increasing cost effective manufacturing [1]. Lean operations uses statistical analysis to drive quality improvements, whereas business process management stresses process optimization and automation to achieve performance improvement [2], [3]. Although the two techniques were once thought to be mutually exclusive, several businesses have learned that integrating business process management and lean operations may provide impressive outcomes, and this study tries to establish this connection [4]. BPM has a solid foundation in software program that may be used to simplify and industrialize operations [5], [6]. BPM makes it possible to connect several groups or departments that have an impact on processes at the software level [7]. Lean analysis is used to assess business procedures and activities, paying special attention to how changes in any one area of the system affect the entire company and help to reduce the production cost [8]–[10]. Every business requires to eliminate cost by maintain product quality, there are various strategies that can be implemented to reduce the production cost by maintain business process management and quality management [11]–[16]. Furthermore, the significance of each variable in this research emphasized to study the relationship and impact of each variable with the beneficial outcomes for manufacturing industry.

1.1.Problem Statement

It is simple to see the effectiveness of combining lean operations and business project management can be once you have a fundamental understanding of both strategies. To figure out the strategic implementation to maintain cost of quality a combined strengths establish a synergy that instils a focus on quality and performance throughout the entire business.

2. THEORETICAL FRAMEWORK

2.1. Business Process Management

[17] Explained Business process management as a key factor towards improvement. It has always been a very important approach for the organizations against the top quality [18]. The concept has been derived from total quality management where the organization calculates the total cost which

it has to spend to retain or improve its quality [19], [20]. This has enabled the organizations to be proactive and efficient in the markets because competition is increasing and companies are finding it hard to survive the competition [21]–[23]. For this reason, literature provides a broad and detailed opinion on the cost of quality and its relation with business process management and lean methodologies [24]. As it has been said that cost of quality goes down when the organization has improved business process management systems [25]–[27]. The business process management allows the organizations to improve their quality by eliminating the bottlenecks or the errors in the organization [28]. This is an important phenomenon because it has become vital for the companies to understand the business process management systems and their effects on the cost of quality of the organization [29]–[31]. There are many different processes in a business and thus companies need to improve their processes by keeping the costs as low as possible and that's why a lot of companies have done well in the past and are still doing better than many other companies [32]. Consider the example of Toyota. The company has refined its processes in a way that its operational costs are very low [33], [34]. This has allowed Toyota to manufacture a large number of units at a very small flow time and tact time and thus its customers do not have to wait for the products to be delivered late [35]. The company's model has been studied by a lot of research companies in the world and this model has also been taught at many different universities around the world. This has led Toyota to earn a big reputation in the market [11], [36]–[38]. The business process management systems are compulsory to be understood by the organizations in detail to shrink their operational expenses [39]. When the operational expenses are decreased, the revenues increase significantly and as a result, the companies see a surge in their profits as well [40]–[42]. By keeping the Toyota model as a standard, many companies around the world have found out as the business processes are strengthened and improved [43]–[45], the costs of quality go down and that's why firms always better against their competitors when the cost of quality is low and thus the improvement through six sigma is always very high which make firms more productive.

2.2. Lean Operations

The companies are operating in a very complex environment because with the passage of time, the competitions are changing and thus organizations are finding it hard to sustain or retain the market share [46], [47]. The lean methodologies allow the organizations to improve their processes by eliminating the unnecessary costs and thus the cost of quality of will significantly go down [48]–[50]. This is because of the reason that companies are opting for improved performance and a

higher productivity and that's why in order to achieve a higher production at the workplace [51], [52], companies need to eliminate the unwanted and unnecessary costs so that the production is more efficient and effective at the workplace [53]–[57]. The delivery of the services gets strengthened and the stock levels go down [58]. One of the main problems which companies face is the stock level because a high stock level always increases the storage costs and thus it automatically reduces the revenues of the organization which ultimately decreases the profits [59], [60]. The non-value added steps during the operations should be eliminated and thus the lean principles focus on these non-value added steps i.e. waiting, production, processing, movement, transportation, inventory, waiting, and defects [61], [62].

The lean operations explain these wastes in detail and thus a lot of research studies have been done on these topics which explain that why companies should eliminate these wastes to minimize the cost of quality [63]–[66]. This has become important because elimination of these wastes has become an important issue for the organizations [67]–[70]. For example, if a company's manufacturing is to the north but its main market is to the south of the city, its creating a big transportation waste for itself because the transport expenses in this case will be significantly higher for the organization [71], [72]. For this reason, the lean principles define that the transport cost should be minimum for the organizations and thus the manufacturing plant should be closer to the markets where the products have to be delivered [73] so that the company could increase its revenues by lowering its transport costs [29], [74]. Also, the waiting time for many companies is significantly higher [75], [76]. The Toyota model has been adopted by many organizations in the world because Toyota, at an average, produces one car after every eight minutes [77]–[79]. This flowtime is very low and thus Toyota has become one of the widely used automobile companies in the world [80], [81]. Japanese have researched a lot on lean principles and their effects on cost of quality and that's why the lean wastes are widely eliminated in Japan and the concept is widely recognized in the Japanese literature reviews and research studies.

2.3.Cost of Quality

The phrase "cost of quality" (COQ) refers to a system that enables an organization to assess how much of its resources are allocated to operations that avoid poor quality, evaluate the quality of the firm's goods and services, and are caused by both internal and external failures. [82]–[84] explained the importance of cost of quality and its impact on operations. As the companies are focusing on cutting down costs and refining their processes, researchers have provided their

opinions [85] that lean principles play a very crucial role in refining of the processes [86]–[89]. The example of Toyota is there where the Japanese manufacturer cut down the waiting time and thus as a result the processes were refined and the flow time was decreased [90]–[92]. This has led us to the belief that lean principles have a direct relationship with business management processes too [93]. The more refined lean principles will be, the more effective and efficient and refined business processes will be. Lean methods are known as production strategy because they allow the companies to improve their productivity [94]. For example, when Toyota implemented the lean processes, it improved its production strategy and that's why its fixed costs went down [95]–[97]. Furthermore, researchers have seen that waiting time is one of the most crucial problems which companies are facing [98], [99]. For customers, waiting time is something which they do not want to prefer. Many restaurants around the world are shortening the waiting time of their customers by analyzing the patterns and the delivery timings [100]. As the waiting time will be shortened, the business processes will be strengthened and thus the company will earn its reputation and goodwill in the market [101]. The different lean principles have their separate importance and value in the companies [102], [103]. The main purpose is to remove the non-value added steps because the non-value added steps always increase the operational costs and decrease the revenues [104]–[107]. The Japanese research studies have been very exemplary because a lot of industries and markets are studying this model and implementing it at the workplace [108]. This has led the companies to analyze their operations and understand the bottlenecks that were hampering the operational production capacity [109].

Moreover, companies have realized that unnecessary production always results in storage costs being very high. For example, Dell had a very high storage costs because it always produced extra units in the market and kept them in the warehouses for the delivery [110], [111]. As the passage of time, Dell realized that its storage costs were high and its revenues were low so Dell implemented the make to order strategy. When the company would receive an order from the customer, it would manufacture a customized laptop for him/her and thus this made Dell as one of the most efficient laptop companies in the world. It studied the concept of just in time in detail and implemented the strategy because Dell did not want to see a surge in its storage costs [112]–[115]. This is the reason today Dell has captured a huge market around the world and thus its popularity and fame are growing day by day. For this reason, companies always wish to lower the storage

costs so that their processes are refined and thus these two have a direct connection in a way that more refined lean processes, the more refined business management processes will be [84].

3. LITERATURE REVIEW

3.1. Impact of Business Process Management and Lean Operations on Cost of Quality

In order for quality to have the desired long-term impact on the business, the expenses of performing a quality task, carrying out quality enhancements, and accomplishing targets must be carefully managed [116], [117]. It is better to determine these costs from an analysis of the costs of quality since they must be a true reflection of the quality effort [118]. The success of quality management can be evaluated using such an analysis, which also identifies chances for cost reductions and issue areas [119]. Lean principles, business process management and cost of quality all have a direct and indirect relation with each other. [120] explained with the help of refined processes, the cost of quality goes down because the company does not have to spend a huge cost for its processes improvement [121]. With the introduction of six sigma at the workplace, people and companies have seen a rise in its process improvement because it is directly linked with lean principles too [122], [123]. The lean principles state that defected products should be automatically removed from the pack and thus quality assurance should be done at each step [124].

In other words, Lean operations enables an organisation to drastically boost customer satisfaction while drastically reducing waste and improving efficiency by reducing the variability in its goods and services [125]–[128]. Users of lean operations go through a rigorous training process that progresses through various stages of increasing sophistication based on experience and success [129]. Professional Lean production practitioners and consultants typically work toward obtaining experience at various levels, improving their capacity to assist in directing the development and use of the lean operations strategies [130]. This has allowed a lot of organizations to strengthen and improve their processes and has let the companies to be more efficient and productive at the workplace [131], [132]. This is important because since the competitions are growing in the markets, companies are looking for different types of ways to be more production in the market and to achieve the competitive edge in order to beat the customers and retain the market share because the demands are continuously changing and people are adopting new strategies and wishes with time [4]. Lean principles have got a worldwide support and recognition because these

principles have shortened the problems and issues of Companies and have allowed a surge in profits [133].

The example of Nokia is in front of everyone where the Finnish giant did not refine its processes and thus it saw a decline in its market share. Its cost of quality continued to increase and it eventually went out of the market [134], [135]. This was because of the reason that lean principles were not implementing and Nokia did not conclude that its products were being produced in overproduction capacity as their demands were simply not in the market. And thus Apple and Samsung overtook Nokia in the market and now they're the world leaders in a true sense [136], [137]. For this reason, the adoption of lean has become has important concern for companies around the world and thus many organizations are putting their efforts to refine their businesses processes because competitive advantages are not easy to achieve and little efforts have to be put by the organizations as the example of Toyota has suggested that the Japanese automobile's model is being studied at the global level. This literature review has provided opinions and examples from academic published journals around the world.

3.1 General Research Model

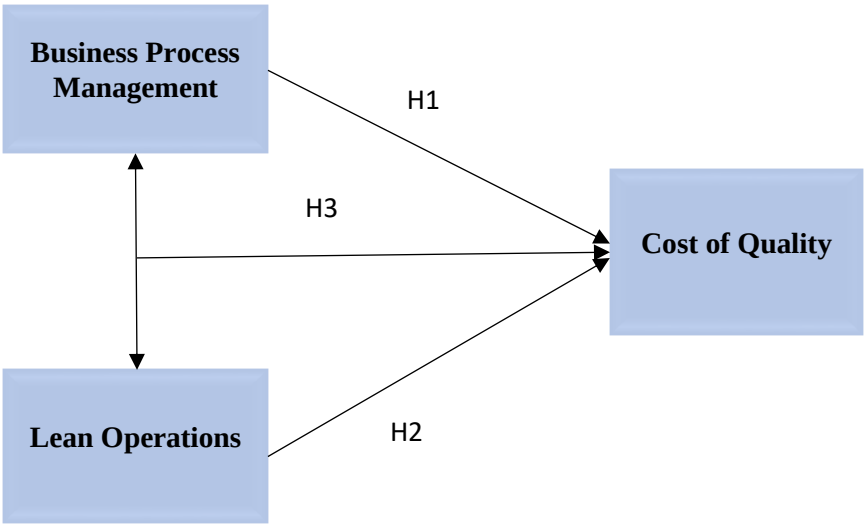

Figure 1: Conceptual Research Model

4. DISCUSSION

It is simple to see how effective is relating lean operations strategies and BPM to reduce cost of quality and maintain the competitive advantage. Their combined strengths establish a synergy that instils a focus on quality and performance throughout the entire business. It is acknowledged that BPM is a crucial component of most quality management systems. The quality management paradigm, which largely relies on a systematic approach to BPM, concentrates on all organizational activities. Through modelling and analysis of inputs, outputs, and performance, BPM excels at understanding processes and workflow. However, it is less proficient at analyzing data linked to extremely complex or diverse issues. In order for quality to have the desired long-term impact on the business, the expenses of performing a quality task, carrying out quality enhancements, and accomplishing targets must be carefully managed. It is better to determine these costs from an analysis of the costs of quality since they must be a true reflection of the quality effort. The success of quality management can be evaluated using such an analysis, which also identifies chances for cost reductions and issue areas to meet the organizational objectives.

5. CONCLUSION

A scientific research based evidences has been discussed and concluded. In this research it can be said that, business process management and lean operations require a sizable investment from a company or organization, and their comprehensive implementation takes time. Since significant organizational change is frequently necessary, the majority of businesses start with an experimental plan and gradually increase their use over several years. However, the significant business advantages that may be produced by combining BPM and lean production are well worth the time and effort in order to reduce production cost and maintaining business quality.

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