ACHIEVING COMPETITIVE ADVANTAGE THROUGH THE LEAN SIX SIGMA MODEL

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Abstract

In light of the intricate and evolving market landscape induced by globalisation and the health crisis, companies must swiftly respond to the actions of their competitors. Organisations seeking success must attentively monitor their operational environment, acquire information, and respond swiftly to enhance performance. For businesses seeking to distinguish themselves and deliver superior products, a reliable competitive advantage is necessary. Lean Six Sigma is a tool that aids in minimising errors, eliminating non-value-added tasks, and reducing process variations, while enhancing quality and efficiency.The implementation of Six Sigma yields advantages in time-dependent, customer-centric, quality-focused, process enhancement, human resource management, sales, financial oversight, and decision-making processes. There are a number of practical ramifications that have been observed to be associated with the implementation of Six Sigma. These ramifications include the promotion of time efficiency, the improvement of effectiveness, and the enhancement of the reliability of activities. As a result, an organization's performance is enhanced, and the successful delivery of processes, products, and services is made easier. This essay seeks to clarify the concepts of lean and six sigma and examine the advantages and potential barriers of incorporating these methodologies into a business plan. This essay constitutes a literature review that provides a summary of essential terms designed to inform future research. The conclusions were drawn based on the developed framework.

Keywords: *lean six sigma,lean, six sigma, sustainability, competitive advantage*

Classification JEL: *M1: M9*

1. Introduction and context of the study

Globalisation is frequently linked to volatile market conditions and uncertainty, imposing organisations to possess the capability to respond promptly to competitors' actions (Cornescu et al, 2004; Toma, 2005; Marinescu and Toma, 2015a). The national and worldwide markets of the 21st century are experiencing complexity and a rapidly evolving environment, marked by ambiguous organisational borders, particularly due to the health crisis caused by the COVID-19 pandemic (Mutmainah et al, 2020). To thrive in this marketplace, organisations must observe the business environment, acquire intellectual insights, and make timely and suitable decisions when confronted with various market possibilities and risks to enhance their performance relative to competitors (Amiri et al, 2017). The concept of sustainable competitive advantage has been increasingly examined in recent times. A large survey of literature exists focused on identifying optimal strategies and instruments for achieving this objective. This paper briefly examines the definition of Lean Six Sigma and the competitive advantages it presents, as well as some of the challenges and barriers it might encounter.

2. Literature review

The notion of sustainable competitive advantage is a crucial component for organisations pursuing a differentiation strategy and offering superior quality products compared to their competitors in a highly volatile business environment ((Toma, 2013; Toma and Marinescu, 2015a). The paradigms that can support, develop, or establish a competitive advantage, including adaptability, innovation, instruments for management, and technologies through digitisation, have

been extensively examined (Rifqi et al, 2024). Originated from Six Sigma (Toma, 2008a), Lean Six Sigma is a tool that can be employed to aid this process.

Lean Six Sigma is a management technique designed to boost business efficiency and profitability by maximising client satisfaction via the reduction of restrictions associated with non-value-adding activities inside the organization (Yadav and Desai, 2017). It is a methodical, project-focused, statistically grounded technique aimed at diminishing variation in procedures by eradicating deficiencies in both goods and processes. From a statistical standpoint, Six Sigma is a metric for process evaluation denoted by the Greek letter (σ), which signifies the degree of variation within the average sample of data (Aboelmaged, 2010). Lean Six Sigma is an enhancement strategy that analyses quantitative data on company performance in order to identify, remove, and regulate issues and inefficiencies associated with manufacturing expenses, service costs, quality, efficiency, and customer satisfaction all throughout company processes (Singh and Rathi, 2019). The goals of quality and productivity, underpinned by Lean Six Sigma, can be accomplished by DMAIC: a systematic approach for enhancing the performance of current processes which involves the implementation of the Define, Measure, Analyse, Improve, and Control principles. It offers a standardised framework for the development of enhanced projects and presents various statistical instruments and methods suitable for each phase of the DMAIC cycle (Sordan et al, 2020), which are capable of identifying the underlying causes of company issues, eliminating waste, and reducing variation, thereby ensuring significant enhancements in business operations (Bhat et al, 2020).

Researchers contend that the advantages of Six Sigma are substantial and extend beyond mere financial profits (Alkasisbeh et al, 2018). Lean furnishes the essential instruments to establish the Lean Six Sigma technique (Ohno, 2019). The two techniques mutually support one another in some respects (Citybabu and Yamini, 2022). The existing literature research has identified the following advantages of applying Six Sigma in processes overall: time-dependent, customer-focused, quality-oriented, process improvement-oriented, human resource-related, sales-related, finance-focused, and decision-oriented.

Scholars contend that a key advantage of Six Sigma deployment is the diminution of process cycle duration. Researchers have found enhanced client fulfilment as a key advantage of Six Sigma deployment (Dalalah, 2019). This typically diminishes consumer complaints (Aboelmaged, 2010) and mitigates risks to individuals. Additional suggested advantages include Six Sigma's capacity to facilitate comprehension of customer requirements and to strive for reaching or surpassing those expectations to enhance customer satisfaction. Experts (Antony et al, 2016) recognised the reduction of faults in product workflows as an advantage of applying Six Sigma. Aboelmaged (2010) noted enhanced reporting accuracy as an advantage. Other investigations (Patel and Desai, 2018) have documented significant enhancements in product quality as a benefit, while some interpret this enhancement as a decrease in product or process breakdown.

A distinct type of value identified pertains to process enhancement. Certain studies see Six Sigma's capacity to enhance the efficiency, effectiveness, and dependability of activities as an advantage (Sanchez-Rebull et al, 2020). Others (Antony et al, 2016) associate Six Sigma's capacity to diminish operations that do not add value as an advantage. This diminishes variation in the process, resulting in predictability. Being predictable shifts corporate culture from a reactive approach to a proactive stance. Proactivity enhances productivity and expedites outcomes, while optimising the service supply chain (Aboelmaged, 2010). This results in the ongoing enhancement of an organization's performance, facilitating the attainment of procedures, goods, and services that approach ideal. It has been contended that Six Sigma enhances organisational expertise in optimising performance methodologies via the belt structure. It also boosts cross-functional collaboration (Adina-Petruta and Roxana, 2014), stimulates innovative thinking, fosters innovation

(Parast, 2011), and boosts employee happiness. Job satisfaction enhances employee morale, facilitating their compliance with superiors, hence augmenting accountability.

Six Sigma has enhanced sales for specific businesses. This is due to the integration of error removal inside the process, resulting in the production of ideal items. This results in advantages regarding enhanced market penetration. Reports indicate financial benefits following Six Sigma deployment, attributed to its capacity to lower costs. This is accomplished by decreasing the expenses associated with low quality (Aboelmaged, 2010).

Some individuals choose to view this advantage via the lens of enhanced profitability (Ambekar and Hudnurkar, 2017). This results in improved economic outcomes when projects are executed under budget. Six Sigma enables fact-based decision-making, resulting in successful managerial choices (Adina-Petruta and Roxana, 2014), which enhances the precision of distributing resources as decisions are made using data with greater consistency. All in all, Lean Six Sigma represents a powerful model which contribute to business success of any corporation, irrespective of its industry. It should be mixed with efficient management (Toma, 2008b; Toma and Marinescu, 2015b) and wise leadership (Toma et al, 2014; Marinescu and Toma, 2015b; Toma et al, 2020a; Toma et al, 2020b; Grădinaru et al, 2020; Toma, 2024a), deep strategic thinking (Toma et al, 2016a; Toma, 2024b) and planning (Toma et al, 2016b), effective business and corporate strategies (Toma and Marinescu, 2013; Toma and Grădinaru, 2016; Toma, 2023a; Toma, 2023b), enduring business models (Toma and Marinescu, 2012; Toma and Tohănean, 2018; Tohănean and Toma, 2018; Toma and Tohănean, 2019; Tohănean and Toma, 2024a). Also, corporations may demonstrate a clear entrepreneurial orientation (Toma et al, 2017; Toma, 2019; Catană et al, 2020; Toma et al, 2021; Toma, 2023c) and implement other methods in their business processes such as quality (Toma, 2006a; Toma, 2006b; Toma and Naruo, 2009; Toma et al, 2012), agile (Toma, 2023d) and lean management (Naruo et al, 2007; Marinescu and Toma, 2008; Toma et al, 2022), continuous organizational learning and training (Toma, 2011; Toma, 2012; Marinescu and Toma, 2013; Toma and Hudea, 2024), Balanced Scorecard (Toma et al, 2010), marketing mix (Marinescu et al, 2010b; Grădinaru and Toma, 2017; Catană and Toma, 2021) and customer experience (Toma and Catană, 2021a; Toma and Catană, 2021b), and teleworking (Catană et al, 2021).

The previously cited research examines the potential contributions of Lean Six Sigma as a tool in an optimal environment. At present, significant effects on individuals, enterprises, and economies can be observed due to the coronavirus illness COVID-19 (Lim and To, 2022). The COVID-19 pandemic worldwide resulted in unforeseen interruptions in industrial operations (Nicola et al, 2020). The pandemic's effects, along with other events such as the ongoing conflict in Ukraine, the oil crisis, and climate challenges, have resulted in medium- to long-term repercussions on supply chains, exacerbating disruptions and contributing to global inflation. Furthermore, COVID-19 has created an adverse situation impacting essential stock availability: a rapid surge in demand coupled with substantial raw material shortages due to worldwide disruptions in supply chains (Paul and Chowdhury, 2021). The pandemic has compelled businesses to reevaluate both operational and strategic objectives, which they had not foreseen (Ivanov, 2020).

3. Methodology

The present study employs a qualitative research methodology that integrates an extensive literature review with a thematic analysis. The writers collected and evaluated secondary sources on the topic from previously released books, papers, and research publications. The search criteria included lean, Six Sigma, sustainability, along with competitive advantage. The thematic analysis identified significant trends, including technical factors, competitive strategies, and sustainability outcomes. The qualitative technique facilitates thorough inquiry, however, it restricts sweeping generalisations The investigation started with a summary and discussion of the concepts, which were subsequently included and analysed in the findings section to fulfill the research's defined

objective. This work's approach is grounded in a comprehensive study conducted by a group of distinguished specialists in the same academic discipline.

4. Results and discussion

As mentioned in the above literature review, the practice of lean manufacturing is a process comprising various management techniques and the optimisation of manufacturing operations aimed at eliminating waste and reducing uncertainty among suppliers, customers, and internal assets and procedures (Hasan et al, 2022). The pandemic has adversely impacted economic growth, since many nations have diminished expenditures on capital projects necessary for adequately equipping their health sectors, hence curtailing investments in other areas. The epidemic necessitated a revision of workplace practices aimed at safeguarding employee health. Furthermore, scholars are increasingly focusing on management strategies that facilitate the ongoing advancement of businesses (Tortorella et al, 2021).

The findings from the aforementioned literature study regarding the implementation of a Lean Six Sigma model indicate advantages in several domains, including cost reduction, enhanced quality, expedited delivery times, and improved employee performance (Cavdur et al, 2019). The expectation of obtaining these benefits, along with the necessity for businesses to enhance their competitiveness, has prompted organisations worldwide to extensively pursue the use of this technology (Buer et al, 2021).

Nevertheless, the authors have outlined a list of many challenges and difficulties that must be considered when determining whether a corporation should run this.

According to Singh and Rathi (2021), inadequate technology infrastructure poses a significant impediment to the implementation of lean operations. Consequently, it is essential to assess if the existing infrastructure can support the efficient application of the lean six sigma methodology.

Secondly, Parmar and Desai (2020) assert that the absence of strategic incentive and performance management hinders employee participation in lean and continuous improvement initiatives. Therefore, it is essential to implement a structure that delineates employees' duties and responsibilities, as well as any potential incentives that may encourage them to embrace the refreshed strategy.

Maware and Parsley (2022) discovered that organisations frequently exhibit a rigid nature and demonstrate reluctance to modify their management structures in response to evolving circumstances. Consequently, companies must become adaptable to the suggested new structure to enhance the tool's success.

Bashar and Hasin (2019) asserted that employees frequently lack a fundamental comprehension of the lean idea and the implementation of lean technologies. Consequently, insufficient comprehension of the lean concept is recognised as an impediment, necessitating that organisations implement enough training to ensure staff grasp the new needs.

Finally, Hasan et al (2022) identified the poor selection and customisation of lean tools as a major impediment to lean deployment. This is the most significant obstacle, as an inadequately tailored lean six sigma approach will impede rather than facilitate changes inside the organisation.

5. Conclusions

In brief, the paper asserts that Lean Six Sigma is a technique that enables organisations to attain sustained competitive advantage by minimising process variations, errors, and non-value-added activities. Applying Six Sigma offers various advantages, including decreased process cycle time, improved customer satisfaction, innovation, increased team morale, and boosted sales. Nevertheless, some considerations must be examined before determining the appropriateness of this instrument for a business plan, since neglecting these might introduce new barriers and issues that may impede future progress.

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