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Lean Management System Implementation and Operational Performance of Company Z

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Abstract—This study explored the level of Lean management system implementation and Operational performance of Company Z anchored in the Toyota 4P Model by Jeffrey Liker. The research focused on four key variables: Philosophy, Process, People, and Problem Solving affecting the lean management system implementation. Furthermore, the study examined the Operational performance of Company Z through four major domains: Quality, Inventory Management, Productivity, and Cost Efficiency. The study was anchored on Lean Thinking. A total of 41 surveys were collected at purposive sampling using a researcher-made questionnaire and the model was analyzed and evaluated using the Mean, Four-point Likert Scale, and Pearson Product-moment Correlation. The analysis revealed significant relationship the r values 0.456 to 0.857 were interpreted as with positive to strong positive as to correlate between Lean management system implementation and Operational Performance. The computed probability values .000 to .003 were lesser than the level of significant (P<0.05); thus, the null hypothesis is rejected. The results show that their significant relationship between independent and dependent variables. Furthermore, the study proposed an action plan to develop and improve Lean management system implementation as a strategic initiative aimed at assisting Corporation Z in fostering a supportive and inclusive Production Planning and Inventory Control, ultimately to enhancing their overall Operational performance.

***Index Terms*— Lean Management System, Philosophy, People, Process, Problem Solving, Operational Performance, Quality, Inventory Minimization, Productivity, Cost Efficiency.**

1. Introduction

Lean management emphasizes continuous improvement by eliminating waste and maximizing value, drawing inspiration from the lean muscle analogy—removing excess to enhance performance. Rooted in the Toyota Production System and popularized globally, Lean has become a cornerstone of modern operational strategies. However, successful implementation remains a challenge, as many organizations struggle with cultural resistance, inadequate training, and limited management support.

In the Philippines, efforts to promote Lean practices, such as the Development Academy of the Philippines' 2021 webinar, have underscored the importance of standardization and foundational principles like Toyota's 4Ps. Lean's benefits include increased efficiency, reduced costs, and improved customer satisfaction—crucial in today's fast-changing business environment. Yet, many firms fall short due to a lack of proper integration and internal alignment.

Company Z, a Filipino snack manufacturer, pursued Lean to boost its operational performance, particularly in its Laguna plant. The study explored barriers to Lean implementation through surveys conducted at various organizational levels. Results highlighted key issues affecting success and provided insights to enhance Lean practices, reinforcing the company's mission of continuous improvement and delivering top value to its consumers.

2. Literature Review

Relative to the literature, references, and studies presented have highlighted similarities in stated by Studies of Muhammad et al. (2021), Maware et al. (2022) emphasize that successful lean management implementation requires leadership commitment, employee involvement, and continuous improvement. These elements help organizations drive operational excellence, stay competitive, and align production with customer needs, reducing waste while boosting efficiency. However, no studies between 2015 and March 2020 reported any negative impacts of LM in manufacturing industries across both developed and developing countries.

However, studies by Womack (2020), Rochin (2020), highlight that lean management (LM) implementation success has been inconsistent. Initially, organizations may experience a decline in process stability. Lean management involves managers at all levels addressing key problems and working with teams to find solutions, but lack of technical knowledge is a major contributor to failure. Insufficient expertise at various levels, including workforce, supervisory, and management, often hampers success. Key factors for effective implementation include customer focus, management commitment, clear communication, and alignment with organizational strategy. Despite its promise, LM's impact on performance remains unclear and varies across industries and countries. Additionally, while lean has led to many successes, 90% of manufacturers fail to sustain it, leading to the consideration of lean culture as a soft approach for more sustainable implementation.

Studies by Dieste et al. (2021) and Panigrahi, S. (2023) highlight the positive impact of Lean Management (LM) on

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operational performance in both developing and developed countries. Lean practices, particularly Just-In-Time (JIT) and Lean manufacturing, improve operational, financial, and organizational performance. These practices lead to better sustainability outcomes, increased efficiency, and higher productivity. For example, in the textile industry, LM enhances employee performance, competitiveness, and response to customer needs. In Malaysia's public sector, LM has improved service quality and reduced operating costs, with notable reductions in waste and improved efficiency. Additionally, the pharmaceutical sector has also seen successful LM implementation, enhancing overall operations.

In the other hand Prohanceblog (2024) emphasize that implementing Lean Management (LM) can be challenging, especially as it requires employees to adopt new ways of working. Effective communication, training, and ongoing support are crucial to successfully integrate these changes into daily operations. Tracking performance with key performance indicators (KPIs) is essential to assess progress and make necessary adjustments if outcomes fall short. While LM is widely applied in industrial manufacturing, its impact on operational and business performance is still not fully understood.

In terms of relationship studies by Hardcopf et al. (2021), highlights a significant and positive relationship between Lean Management (LM) and various aspects of operational performance, including cost, quality, and delivery. These findings offer valuable insights into how lean practices and organizational culture interact to improve operational performance, particularly in Indian manufacturing SMEs. However, in study of Diaz (2023) the analysis shows that Lean Management (LM) have not improved Wastecon Inc.'s operational performance (OP). LM was only partially implemented they were insufficient. Other factors affecting OP include employee engagement, organizational culture, and asset management. To improve, the company should implement a full digital transformation, adopt more LM practices like small group problem-solving.

3. Methodology

This study utilized descriptive-correlational method of research was used to determine the relationship between the lean management system, as the independent variable, and the level of operational performance, as the dependent variable. Descriptive analysis was applied to describe the current status of the identified variables. In conjunction with correlational analysis, it aimed to evaluate the extent of the relationship between the variables by using statistical data. A survey questionnaire was used as the primary data collection tool, targeting key personnel involved in lean management system. The research was conducted on the Lean Management System team at Company Z, located in Laguna, consisting of individuals working across various departments within the manufacturing firm. This included employees of any age and gender who qualified as part of the Lean Management System team.

The respondents of the study consisted of 41 LMS team members. These individuals were drawn from planning, warehouse and logistics department within the organization, including 2 at the Managerial level, 9 at the Supervisory level, and 30 at the Rank and File level in Laguna. Purposive sampling referred to a group of non-probability sampling techniques in which units were selected because they had characteristics that were needed in the sample. In other words, units were selected “on purpose” in purposive sampling. In this case, the focus of the study was on the Lean Management System (LMS) team members who met certain criteria that were directly relevant to the research question, who had direct trained and experience with LMS implementation as the subject matter, and who had specialized knowledge about the research topic, within Company Z.

In this investigation into the Lean Management System and Operational performance in Company Z, the questionnaire served as the primary tool for data collection. This self-made questionnaire was meticulously crafted by the researcher and was structured into two essential sections. The first segment delved into the Lean Management System Implementation, followed by an in-depth exploration of operational performance in the second part. The instrument underwent validation by three experts, and a pre-test was conducted with 15 respondents to ensure reliability, with the results yielding a high internal consistency, as evidenced by Cronbach’s alpha ranging from 0.94 to 0.96.

The data collection process involved distributing the survey via Google Forms after obtaining the necessary permissions from the institution. Participants were informed about the voluntary nature of their participation and were assured that their responses would be kept confidential. Data analysis was conducted using descriptive statistics, including the weighted mean and Pearson correlation analysis, to determine the relationships between technology adoption, the challenges encountered, and the impact on supply chain performance.

The study adhered to ethical guidelines throughout the research process. Informed consent was obtained from all participants, and confidentiality was strictly maintained. The data collected were stored securely and disposed of according to legal and institutional protocols, ensuring the integrity and privacy of the research.

This methodology provided a comprehensive approach to examining the Lean management system implantation and operational performance of Company Z while ensuring the accuracy and ethical integrity of the research process.

4. Results, Analysis and Discussion

A. The Level of Lean Management System Implementation

Table 1

Indicators	Mean	Verbal Interpretation	Rank
Philosophy	3.24	Implemented	1
People	3.21	Implemented	2
Process	3.08	Implemented	3
Problem Solving	2.99	Implemented	4
General Assessment	**3.13**	Implemented	

Legend: 3.25 - 4.00 Highly Implemented 2.50 - 3.24 Implemented
1.75 - 2.49 Moderately Implemented 1.00 - 1.74 Not Implemented

The table 1 presents level of Lean Management System

implementation of Company Z had a general assessment of 3.13 which verbally interpreted as Implemented. Furthermore, the sub variable "Philosophy" had the highest computed mean of 3.24 which verbally interpreted as implemented meanwhile, the sub variable "Problem Solving" had lowest computed mean of 2.99 which was verbally interpreted as Implemented. It can be concluded that the results align with the broader literature that emphasizes the need for organizations to fully embrace Lean management to drive operational efficiency.

B. The Level of Operational Performance

Table 2

Indicators	Mean	Verbal Interpretation	Rank
Quality	3.09	Good	1
Inventory Minimization	2.97	Good	2
Productivity	3.14	Good	3
Cost Efficiency	3.11	Good	4
General Assessment	**3.08**	Good	

Legend: 3.25 - 4.00 Very Good 2.50 - 3.24 Good
1.75 - 2.49 Fair 1.00 - 1.74 Poor

The level of Operational Performance Company Z as shown in Table 2 had a general weighted mean of 3.08 which verbally interpreted as Good. Furthermore, the sub variable "Cost Efficiency" had the highest computed mean of 3.11 which verbally interpreted as Good meanwhile, the sub variable "Inventory Minimization" had lowest computed mean of 2.97 which was verbally interpreted as Good.

C. The Relationship Between Lean Management System Implementation and Operational Performance of Company Z

Table 3 shows Test of Significant Relationship between Lean management system implementation and Operational Performance the r values 0.456 to 0.857 were interpreted as with positive to strong positive as to correlate Lean management system implementation and Operational Performance. The computed probability values 0.000 to 0.003 were lesser than the level of significant ($P<0.05$); thus, the null hypothesis is rejected. The results show that their significant relationship between independent and dependent variables.

Also, Table shows significant relationships between Philosophy and Quality, Inventory Minimization, Productivity, Cost efficiency r value 0.456 to 0.712 and p value 0.000 to 0.003 thus, the null hypothesis is rejected. Significant relationships between Process and Quality, Inventory Minimization, Productivity, Cost efficiency r value 0.611 to 0.785 and p value 0.000 thus, the null hypothesis is rejected. Significant relationships between People and Quality, Inventory Minimization, Productivity, Cost efficiency r value 0.660 to 0.821 and p value 0.000 thus, the null hypothesis is rejected. Significant relationships between Problem Solving and Quality, Inventory Minimization, Productivity, Cost efficiency r value 0.754 to 0.857 and p value 0.000 thus, the null hypothesis is rejected. It can be concluded that the level of Lean management system implementation has significant relationship with Operational Performance level. The higher the Lean management system implementation, the higher the Operational Performance.

The findings from the Table on Lean Management System Implementation and Operational Performance indicate a significant positive relationship between the level of Lean management system implementation and operational performance, as evidenced by correlation values ranging from 0.456 to 0.857 and significant probability values ($P<0.05$).

Table 3

Lean Management System	Operational Performance	r value	p value	Correlation	Remarks	Decision
Philosophy	Quality	0.627	0.000	Moderate positive	Significant	Reject H_0
	Inventory Minimization	0.541	0.000	Moderate positive	Significant	Reject H_0
	Productivity	0.712	0.000	Moderate positive	Significant	Reject H_0
	Cost Efficiency	0.456	0.003	Positive	Significant	Reject H_0
Process	Quality	0.627	0.000	Moderate positive	Significant	Reject H_0
	Inventory Minimization	0.733	0.000	Moderate positive	Significant	Reject H_0
	Productivity	0.785	0.000	Strong positive	Significant	Reject H_0
	Cost Efficiency	0.611	0.000	Moderate positive	Significant	Reject H_0
People	Quality	0.798	0.000	Strong positive	Significant	Reject H_0
	Inventory Minimization	0.660	0.000	Moderate positive	Significant	Reject H_0
	Productivity	0.821	0.000	Strong positive	Significant	Reject H_0
	Cost Efficiency	0.706	0.000	Moderate positive	Significant	Reject H_0
Problem Solving	Quality	0.754	0.000	Strong positive	Significant	Reject H_0
	Inventory Minimization	0.811	0.000	Strong positive	Significant	Reject H_0
	Productivity	0.857	0.000	Strong positive	Significant	Reject H_0
	Cost Efficiency	0.779	0.000	Strong positive	Significant	Reject H_0

5. Conclusion

The findings of the study Company Z has made commendable progress in adopting its Lean Management System (LMS), showing a strong commitment through a well-defined mission and long-term vision. While the company has successfully applied tools like 5S to improve workplace organization, further steps such as expanding semi-automation and promoting consistent Lean thinking across departments are still needed. Leadership engagement is evident with the formation of a dedicated Lean team, though empowering employees more in decision-making could further enhance the system's effectiveness. Regular team meetings are fostering a culture of continuous improvement, but greater visibility of performance metrics at workstations could strengthen problem-solving and operational outcomes.

Operationally, Company Z has seen positive results in key areas including Quality, Inventory Minimization, Productivity, and Cost Efficiency. Improvements in cleanliness and defect prevention have contributed to higher quality, though consistency in output needs attention. Inventory strategies have reduced obsolescence and aligned better with customer demand, yet occasional stock-outs highlight the need for stronger controls. Productivity has been boosted by Lean tools like 5S and Value Stream Mapping, and cost efficiency has improved due to waste reduction. However, challenges such as rework and downtime remain and addressing them will be essential for further gains.

In summary, a strong correlation exists between the degree of LMS implementation and enhanced operational performance. To capitalize on these improvements, Company Z should implement its proposed action plan via PPIC, focusing on inventory accuracy, clearer performance tracking, and expanding semi-automation. These steps will reinforce Lean practices and drive sustainable, long-term operational excellence.

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