



Lean Management and Warehouse Inventory Efficiency in LBC Express, Incorporated: Basis for Enhancement Plan

Krizadel L Cortejo

MBA Graduate School, City of Cabuyao, Laguna, Philippines

* Corresponding Author: **Krizadel L Cortejo**

Article Info

ISSN (Online): 2582-7138

Impact Factor (RSIF): 8.04

Volume: 07

Issue: 03

May-June 2026

Received: 26-02-2026

Accepted: 28-03-2026

Published: 30-04-2026

Page No: 158-162

Abstract

This research applied a descriptive-correlational methodology to examine the relationship between Lean Management specifically 5S, Just-in-Time, Kanban, Kaizen and warehouse inventory efficiency. In total, 54 responses from questionnaires distributed via a Likert scale were analyzed using Weighted Mean, Shapiro-Wilk, Spearman's Rho, and Simple Linear Regression to determine the effects on accuracy, turnover, cycle time, and order fulfilment. The outcomes suggested that the techniques were widely implemented and that efficiency was high. Statistical analysis provided evidence of a significant relationship whereby lean management is attributed for more than 50% of the total variance from the outcome thus null hypotheses are rejected. It was also noted that while kaizen and 5s were more dominant as previous drivers for achieving this, operational speed was also found to be more evident than accuracy/precision regarding the use of visual controls & reducing shrinkage. An improvement plan matrix was submitted, with a digitally-integrated Kanban and Kaizen workshop expected to maintain quality and assist in obtaining ISO 9001 Certification.

DOI: <https://doi.org/10.54660/IJMRGE.2026.7.3.158-162>

Keywords: Lean Management, Warehouse Inventory Efficiency, 5s, Just-in-time, Kanban, Kaizen, Descriptive-Correlation, Simple Linear Regression, ISO 9001 Certification.

1. Introduction

In the competitive logistics arena, efficient inventory management is the primary engine driving performance in any organization. Global issues such as inaccuracies in inventory capture and high cycle times are making Lean Management popular as a panacea." On an international scale, Lean applications have decreased operating costs between 20-30% and reduced warehouse order processing time by half, 50% (De Jesus Pacheco & Baumann, 2023; Jarašūnienė & Čereška, 2023) ^[2, 4]. Logistics and warehousing in the Philippines are expanding at a rate of 8.2% CAGR, according to Ken Research (2023) ^[5]. Despite this growth opportunity shrinkage and slow processing still exist. Through the application of the Theory of Constraints (TOC) methodology (Syiam & Hastuti, 2021) ^[6] and Resource-Based View (RBV) (Azeem *et al.*, 2021) ^[1], this study was conducted to identify whether implementing 5S, JIT, Kanban and Kaizen at LBC Express Inc., would result in improved metric measurements, and to suggest a data-based improvement plan.

2. Methodology

2.1. Research Design

This study is a descriptive-correlational research study with impact analysis, assessing the potential relationships in LBC Express, Inc.'s operational context. This was the best method for realistically evaluating LBC's existing Lean implementation

without manipulating variables and providing depth of insight into the warehouse system. Additionally, applying an IV–DV framework, the researcher illustrates the process by which the independent variables 5S and Just-in-Time serve as encoders for waste elimination and process standardization. Then, by additionally running Spearman's Rho and Regression Analysis, it adds a layer of influence, illustrating that at least half of the overall efficiency gain was due to lean principles.

2.2. Research Locale

The study was conducted in four purposively chosen warehouse facilities of LBC Express, Inc., located in Luzon. They were purposively chosen because they are the main Manila hub for LBC's logistics operations. Each facility is considered a high-volume center that handles the critical, high-velocity workflow of cargo receiving, sorting, storage, and dispatch.

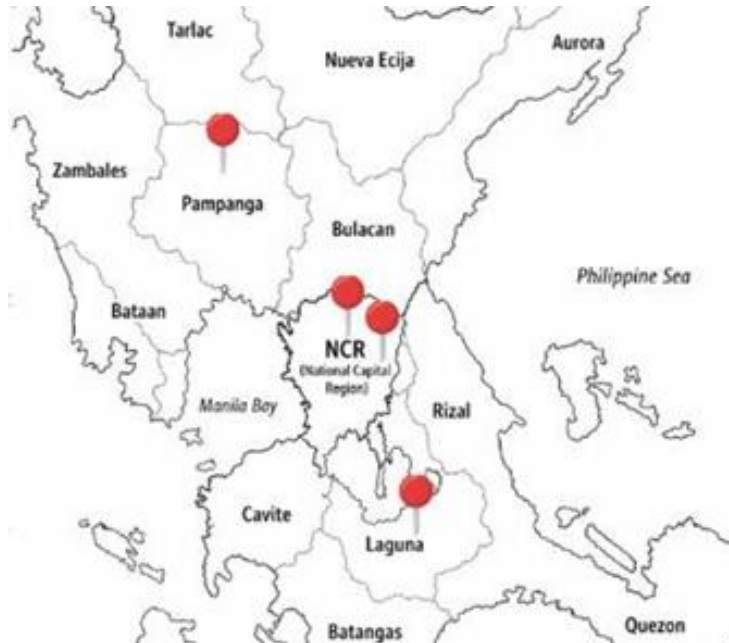


Fig 1: Map of Luzon, Philippines

2.3. Population and Sampling

Using Raosoft's established sampling size calculations (Hair *et al.*, 2022) [3] for a population of 60 warehouse workers of LBC Express with a 95% confidence level and a 5% margin of error, it was determined that the minimum amount of

approved responses would be 52. However, 54 (90%) of the total workforce participated in the research; therefore, it is assumed that there would be less error in the sampling because the results reflect the actual operating conditions.

2.4. Research Participants

Table 1: Eligibility Criteria

Criterion	Inclusion	Exclusion
Service Timeframe	Active employee of LBC Express, Inc.; tenure ranging from less than 1 year to over 11 years	External contractors or individuals not officially employed by the organization
Geographical Location	Assigned to one of the four strategic warehouse facilities in Luzon	Employees assigned to offices or hubs outside the four selected Luzon facilities
Functional Role	Must be part of Warehouse Operations, including receiving, inventory handling, storing, or dispatching	Administrative or executive roles with no direct involvement in warehouse activities
Job Position	Includes Warehouse Managers, Supervisors, Team Leaders, and Warehouse Staff/Associates	Administrative or executive roles with no direct involvement in daily warehouse inventory activities
Age Group	Primarily 20–40-year-old operational workforce	Individuals falling outside the active demographic
Professional Knowledge	Must have first-hand knowledge of inventory management and warehouse practices	New hires from external agencies or those without operational exposure
Ethical Consent	Must provide informed consent and voluntary confirmation	Individuals who declined to participate or withdrew during the survey period

This study used purposive sampling to select participants to obtain in-depth information about specific organizational problems. This sampling technique deliberately included key respondents, from warehousing managers to frontline staff,

who had specialist, first-hand knowledge of day-to-day operations. By looking at exactly those people who undertook these transactions day by day, those judging the effectiveness of the application of 5S, JIT, Kanban, and Kaizen had a high

operational relevance and a basis in first-hand experience upon which to base their judgment and their enhancement plan.

2.5. Research Instrumentation

Research for the study was conducted with a structured survey questionnaire divided into three parts: respondent demographics, 20 items on Lean Management practices, and 19 items on warehouse efficiency. Content validity was established through panel discussions and pilot tests to ensure operational relevance. Testing of reliability using Cronbach's Alpha revealed excellent internal consistency, with coefficients of 0.955 for Lean practices and 0.950 for warehouse efficiency. Both scores are well above the conventional academic score of 0.70, proving reliability. instrument's high reliability.

2.6. Data Gathering Procedure

"This study was conducted after securing permission from the Associate Vice President of Supply Chain and Corporate Sales and the Supply Chain Senior Manager of LBC Express, Inc. I utilized a validated research tool through the link provided in the Google Form I sent via my official accounts to 54 purposively chosen respondents giving 2weeks to complete I tabulated their responses in Excel and exported it using Jamovi (The Jamovi Project, 2023) [7]"

2.7. Ethical Consideration

Prior to contacting LBC Express, Inc.'s management and employees, the researcher obtained formal institutional approval via an endorsement letter from the Pamantasan ng Cabuyao. The researcher provided respondents with an informed consent form informing them of the purpose of the study as well as notifying them of their right to refuse or withdraw their participation from the study at any time. The researcher adhered to the Data Privacy Act of 2012 (RA 10173), ensuring no response was linked with their respective identity and all information collected would remain confidential pursuant to signed Non-Disclosure Agreements (NDAs). The report results do not include survey responders' names so that responders can remain anonymous, and the results will only serve to examine the effectiveness of the Lean Management implementation process through LBC Express, Inc.

3. Results and Discussion

This section presents the empirical results from LBC Express, Inc.'s data collection. It discusses how far they have applied Lean Management techniques and how efficient their warehouse inventory is. Mathematical results from weighted means, correlation, and regression analysis will then indicate how much more they can improve their operations by applying Lean's cause-and-effect principles.

Table 2: Extent of Lean Management Practices Implementation

Lean Management	Mean	Interpretation
5S Methodology	3.83	Highly Implemented
Just-in-Time (JIT)	3.77	Highly Implemented
Kanban	3.69	Highly Implemented
Kaizen	3.81	Highly Implemented
General Assessment	3.78	Highly Implemented

The findings illustrated that Lean Management is no longer something new being trialled, but is embedded within LBC's culture. The 5S Methodology came out top, especially for documented standard procedures,

suggesting an excellent level of operational order. Conversely, Kanban was rated lowest, indicating that, whilst visual indicators are acknowledged, their technical part in preventing stock overproduction needs more work.

Table 3: Level of Warehouse Inventory Efficiency

Warehouse Inventory Efficiency	Mean	Interpretation
Inventory Accuracy	3.81	Highly Efficient
Inventory Turnover	3.79	Highly Efficient
Cycle Time	3.82	Highly Efficient
Space Utilization	3.74	Highly Efficient
Shrinkage	3.69	Highly Efficient
Order Fulfillment Accuracy	3.69	Highly Efficient
General Assessment	3.76	Highly Efficient

LBC Express is classified as Highly Efficient, with Cycle Time being the driving metric. Goods flow quickly through the warehousing process, from receiving to put-away. However, the Defect Rate and Order Fulfillment scores

reveal a "Speed-Quality Gap". Although LBC Express moves quickly, it is also at risk of misshipments and inventory loss, and it needs better quality assurance.

Table 4: Correlation Analysis

Metric	Value	Interpretation
Spearman's Rho (ρ) P-value	0.717	Strong Positive Correlation
Decision on H0	0	Highly Significant (p < 01) Reject H0 is rejected +1

The direction and extent of the relationship were also a Strong Positive Correlation, indicating that with increased

Lean Management application, there would be a substantial increase in warehouse efficiency. The results depict that it is,

in fact, systemic management moves, and not good fortune, that have spurred the efficiency improvements at LBC. This validates the rejection of the null hypothesis and confirms

that 5S and Kaizen are primary drivers for reducing cycle times and increasing accuracy.

Table 5: Impact Analysis

Statistic	Value	Interpretation
R-Square (R2) Standardized Beta (β) Significance	0.514	51.4% Explained Variance
	0.717	Strong Predictive Impact
	0	Highly Significant Model

The regression results show that Lean Management is responsible for 51.4% of the variation in warehouse efficiency. This identifies it as part of the "critical few" when it comes to achieving organisational excellence. Although almost half (48.6%) also relates to factors

beyond managers' immediate control, such as technology and market perturbations, the high beta value adds confidence that Lean practices indeed drive sustainable warehouse performance.

Table 6: Proposed Enhancement Plan

Key Result Area (KRA)	Proposed Activity / Strategy	Timeline	Person-In-Charge	Budgetary Requirements	Success Indicator
1. ISO 9001:2015 Standards	ISO Certification Roadmap: Internal audit, SOP documentation, and external certification audit	Year 1 (Q1–Q4)	Quality Assurance Manager / Warehouse Manager	PHP 250,000 (Audit & Documentation)	95% successful issuance of ISO 9001:2015 certification
2. Internal JIT Scheduling	Demand-Pull Scheduling: Real-time shift adjustment based on hourly inbound/outbound volume	Continuous (Monthly Review)	Warehouse Supervisors	Within operational budget	15% reduction in internal congestion and idle time
3. 5S Sustainability	"5S Patrol Program": Weekly departmental cross-audits using digital inspection applications	Weekly	5S Committee / Floor Leads	PHP 15,000 (Digital tool subscription)	95% completion rate of weekly 5S audits
4. Kanban Optimization	Visual Signal Workshop: Training on responding to Kanban triggers to prevent stock aging	Bi-Annual	Training & Development Department	PHP 50,000 (Training materials)	20% reduction in slow-moving items
5. Quality Control	"Double-Check" QR Protocol: Mandatory scanning verification for final order picking	Immediate Implementation	IT Department / Packing Lead	PHP 100,000 (Scanner upgrades)	95% order fulfillment accuracy rate
6. Loss Prevention	Damage Control Seminar: Safe handling and secure storage training for high-risk items	Quarterly	Safety Officer / HR Department	PHP 30,000 (Seminar costs)	10% reduction in annual shrinkage rate

This enhancement plan for LBC Express, Inc. is designed to seamlessly integrate Lean management principles with global ISO 9001:2015 standards to optimize warehouse inventory efficiency. By standardizing quality management, the organization aims to minimize process variability, transforming Lean practices from isolated initiatives into an ingrained operational culture. A primary objective is to improve internal efficiency through refined just-in-time (JIT) scheduling driven by a demand-pull system. This strategic shift is expected to clear operational bottlenecks, significantly reducing both cycle times and idle labor hours, while effectively preventing surplus inventories and delivery lags.

By institutionalizing Lean Management (5S, JIT, and Kanban) and ISO 9001:2015 Quality Management standards, this proposal aims to develop a clear, bottom-line transition plan to improve inventory efficiency from a spooling business-as-usual state to a Kaizen culture that minimizes losses to maximize productivity and ensure financially sustainable warehousing.

To sustain continuous improvement and foster a deep-rooted Kaizen culture, the plan institutionalizes rigorous 5S auditing—supported by active "5S Patrols"—and enhances the visibility of Kanban systems. Recognizing that warehouse associates comprise approximately 70.4% of the workforce,

targeted Kanban training will be deployed to empower the staff to maintain balanced inventories and avoid excess stock. Furthermore, by strictly enforcing these quality management and safe handling techniques, LBC Express anticipates a sharp decline in operational inefficiencies. This will ultimately secure greater financial stability by minimizing losses associated with shrinkage, product mishandling, and fulfillment errors.

Ensuring the long-term sustainability of these initiatives requires a robust, multi-tiered Monitoring and Evaluation (M&E) framework. At the ground level, managers will conduct weekly "Gemba walks" to observe the Kanban system in real-time, capture immediate employee feedback, and execute swift, minor adjustments. On a monthly basis, the Warehouse Manager and Quality Assurance Team will track critical success indicators, including shrinkage rates, fulfillment accuracy, and 5S scores. To guarantee systemic integrity, formal management audits will be executed quarterly to verify strict adherence to documented SOPs and ISO 9001:2015 standards. Finally, a comprehensive bi-annual impact review will measure overall progress against baseline data specifically evaluating if the interventions have successfully elevated the R2 impact of Lean management beyond the initial efficiency Grand Mean of 3.76.

4. Conclusion

This study examined the relationship between Lean Management and warehouse inventory efficiency of LBC Express, Inc., using a descriptive-correlational research design. It was found that Lean practices, particularly "5S", "Just-in-Time", "Kanban", "Kaizen", are to a large extent adopted in the Warehouse facilities under study, and that the warehousing inventory efficiency and effectiveness as a whole was highly rated, with cycle time being the most rated performance indicator.

Statistical analysis revealed a strong and significant correlation between Lean Management and Warehouse Efficiency. The regression results showed that Lean Accounting practices accounted for 51.4% of the variability in warehouse performance, supporting Evangelista *et al.* (2010), who argued that Lean practices are structured process improvements that enable better performance in Logistics and are not mere luck.

Apart from that, a "speed-quality gap" was identified, with greater speed affecting order fulfillment and inventory accuracy; a more balanced quest for efficiency and quality assurance is required. This can be lessened by finding a digitally integrated Lean solution for this, such as an e-Kanban system that can ensure accurate order fulfillment without the loss of throughput, or it can be a QR-based verification process, or by pursuing the ISO 9001:2015 Certification, achieving a Quality Management System that institutionally applies Lean principles and avoids degradation of processes.

Future Studies can delve into other variables, such as the degree of technology's influence, workforce capability, external environmental variables, and how they affect warehouse performance. SL extended the study of Lean in Philippine Logistics to other LBC Logistics companies to provide insights.

References

1. Azeem M, *et al.* The resource-based view and internal integration in supply chain management. *J Supply Chain Manag.* 2021;45(2):112-28.
2. De Jesus Pacheco DA, Baumann G. Lean warehousing: a systematic literature review and a framework for research. *Int J Logist Manag.* 2023;34(3):675-703. doi:10.1108/IJLM-02-2022-0081
3. Hair JF, Hult GTM, Ringle CM, Sarstedt M. A primer on partial least squares structural equation modeling (PLS-SEM). 3rd ed. Thousand Oaks: Sage Publications; 2022.
4. Jarašūnienė A, Čereška A. Research on the application of lean methodology in the warehouse. *Logistics.* 2023;7(1):15. doi:10.3390/logistics7010015
5. Ken Research. Philippines logistics market outlook to 2027F - Driven by the rising demand from manufacturing, F&B, retail, and increasing government initiatives. *PR Newswire*; 2023.
6. Syiam M, Hastuti S. Applying the theory of constraints to increase production capacity and operational efficiency. *J Ind Eng Manag.* 2021;14(3):450-65.
7. The jamovi project. jamovi (Version 2.3) [Computer software]. 2023. Available from: <https://www.jamovi.org>
8. Wu X, *et al.* Quality management systems and ISO 9001 integration in modern logistics networks. *Int J Prod Econ.* 2022;241:108266.

How to Cite This Article

Cortejo KL. Lean management and warehouse inventory efficiency in LBC Express, Incorporation: basis for enhancement plan. *Int J Multidiscip Res Growth Eval.* 2026 May-Jun;7(3):158–162.

doi:10.54660/IJMRGE.2026.7.3.158-162

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.