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Modeling the Influence of Top Management Support and Organizational Readiness on The Behavioral Intention to Adopt Lean Management in Rwandan Food and Beverage Manufacturing Companies: A Structural Equation Approach

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ABSTRACT: Background: This study examined the influence of Top Management Support and Organizational Readiness on employees' Behavioral Intention to adopt Lean Management in manufacturing companies in Rwanda. Although Lean Management is recognized for improving operational efficiency and promoting continuous improvement, its adoption in developing manufacturing contexts remains constrained by leadership practices and organizational preparedness.

Methods: A quantitative descriptive-correlational research design was employed. A total of 238 employees were selected from Rwandan manufacturing companies using stratified random sampling. Data were analyzed using descriptive statistics and Structural Equation Modeling (SEM) to examine the effects of Top Management Support and Organizational Readiness dimensions on employees' Behavioral Intention to adopt Lean Management.

Findings: Descriptive analysis revealed very low levels of Top Management Support, particularly in Leadership Commitment (Mean = 1.236, SD = 0.418), Resource Allocation (Mean = 1.288, SD = 0.452), and Strategic Priority (Mean = 1.332, SD = 0.468), while Empowerment and Support was rated low (Mean = 1.575, SD = 0.400). Organizational Readiness demonstrated mixed levels, with relatively high scores for Leadership Support (Mean = 2.967, SD = 1.073), Resource Availability (Mean = 2.775, SD = 1.110), and Change Efficacy (Mean = 2.514, SD = 1.171), but low to very low levels for Organizational Culture, Communication Effectiveness, Employee Involvement, and Training and Competence. SEM results indicated that Strategic Priority ($\beta = 0.190$, $p = 0.016$) and Empowerment and Support ($\beta = 0.101$, $p = 0.005$) had significant positive effects on Behavioral Intention to adopt Lean Management, whereas Leadership Commitment and Resource Allocation were not significant predictors. Furthermore, Organizational Readiness dimensions including Leadership Support, Resource Availability, Organizational Culture, Communication Effectiveness, Employee Involvement, and Training and Competence that significantly influenced Behavioral Intention ($p < 0.05$), while Change Commitment and Change Efficacy were not statistically significant. Overall, employees' Behavioral Intention to adopt Lean Management was low (Mean = 1.915, SD = 1.244).

Conclusion: The findings indicate that Organizational Readiness and targeted aspects of Top Management Support are critical drivers of Lean Management adoption in Rwandan manufacturing firms. Lean adoption is more likely when leadership prioritizes Lean strategically and supports employee empowerment, training, effective communication, and participatory organizational systems. It is recommended that manufacturing firms strengthen strategic alignment, invest in continuous training, enhance employee involvement, and improve internal communication to foster sustainable Lean implementation. Future research should explore mediating mechanisms and sector-specific strategies to advance Lean adoption in developing manufacturing environments.

KEYWORDS: Top Management Support, Organizational Readiness, Behavioral Intention, Lean Management, Structural Equation Approach

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INTRODUCTION

In an increasingly competitive global manufacturing landscape, organizations are under sustained pressure to improve operational efficiency, reduce waste, and deliver high-quality products. Lean Management (LM) has emerged as one of the most influential managerial philosophies for achieving these objectives, emphasizing continuous improvement, customer value creation, and systematic waste elimination (De La Vega et al., 2023). Lean principles such as Just-in-Time, Kaizen, and Total Productive Maintenance have been widely implemented across industries, yielding measurable gains in productivity, cost efficiency, and sustainable performance (Akmal et al., 2022; Helmold, 2020). Yet, despite its proven technical effectiveness, global evidence suggests that nearly 70% of Lean transformation initiatives fail, largely due to insufficient Top Management Support and low Organizational Readiness rather than shortcomings in Lean tools themselves (Inuwa & Rahim, 2022; Vega et al., 2023). This paradox underscores a critical challenge: Lean success depends not only on operational techniques but also on leadership commitment, strategic alignment, and employees' readiness to embrace change.

Across the African manufacturing sector, Lean adoption has progressed slowly and unevenly, with many initiatives failing to transition from awareness to sustained practice. Empirical studies consistently identify weak leadership engagement, inadequate resource allocation, fragmented communication, and limited organizational preparedness as major obstacles (Kifle & Chien, 2022). A multi-country assessment across East and West Africa revealed that over 60% of Lean initiatives fail due to insufficient top management support and the absence of structured change management systems (Renstram & Niss, 2015). In South Africa, while Lean awareness exceeds 70%, successful implementation remains below 40%, reflecting limited leadership involvement and organizational readiness (Nkala & du Preez, 2021). Similarly, more than 55% of firms in Kenya and Ethiopia report abandoning Lean initiatives prematurely due to inadequate training, cultural resistance, and weak internal capabilities (Hermkens et al., 2017). Collectively, these findings emphasize that leadership support and organizational readiness are not peripheral factors but central determinants of Lean sustainability in African manufacturing contexts.

In Rwanda, manufacturing plays a strategic role in national economic transformation, supported by policy frameworks such as Vision 2020 and Vision 2050, which prioritize industrialization, ICT integration, and local value addition (Sikubwabo, 2024). The sector comprises approximately 2,500 officially registered manufacturing firms, with broader estimates reaching 7,200 firms nationwide (Olu-Lawal et al., 2024). Despite these favorable policy conditions, Lean implementation remains constrained by low leadership commitment, inadequate resource investment, weak strategic prioritization, and insufficient organizational readiness (Uwamahoro et al., 2024). Organizational challenges such as poor communication, minimal employee involvement, limited training, and cultures resistant to continuous improvement further hinder Lean adoption (Umuhire & Muteteri, 2018). Although Lean adoption in manufacturing reportedly increased from 25% in 2019 to 54% in 2023 (Niyigena Francois* & Mbonigaba Celestin**, 2024), peer-reviewed empirical evidence explaining persistent implementation failures remains scarce. Notably, no published study has empirically modeled how Top Management Support and Organizational Readiness influence employees' behavioral intention to adopt Lean Management in Rwanda. Addressing this gap is essential for advancing theory and practice, and it forms the central focus of the present study.

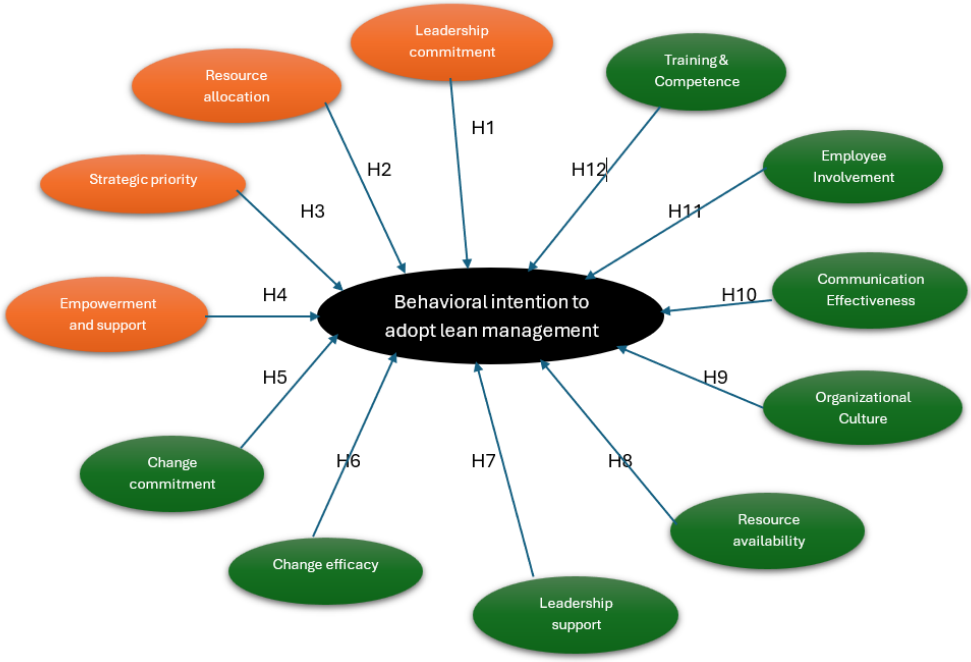
Research Questions

The main objective of this study is to examine and model how top management support and organizational readiness influence the intention to adopt lean management practices within Rwandan manufacturing companies. Specifically, this study aims:

1. To determine the level of top management support perceived by employees to adopt Lean Management in the manufacturing company in terms of:
   1.1. Leadership Commitment
   1.2. Resource Allocation
   1.3. Strategic Priority
   1.4. Empowerment and Support
2. To determine the extent of organizational readiness as perceived by employees to adopt Lean Management in terms of:
   2.1. Change commitment
   2.2. Change Efficacy
   2.3. Leadership Support
   2.4. Resource Availability
   2.5. Organizational Culture
   2.6. Communication Effectiveness
   2.7. Employee Involvement
   2.8. Training and Competence
3. To evaluate the behavioral intention among employees to adopt Lean Management in the manufacturing companies.
4. Examine how organizational readiness mediates the relationship between top management support and behavioral intention to adopt Lean Management.
5. Develop framework though a structural equation model to provide evidence-based insights and strategic recommendations for effective lean management adoption in the Rwandan manufacturing sector.

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Conceptual Framework



***Legend*:** **Dependent variable**
: Independent variable/TPS
Independent variable/OR

Figure 1: Conceptual Framework of the Study

METHOD

This study employed a quantitative research design to examine the influence of Top Management Support and Organizational Readiness on employees' Behavioral Intention to Adopt Lean Management in Rwandan food and beverage manufacturing companies. The study population comprised employees from licensed food and beverage manufacturers, with five companies that randomly selected across Rwanda's five provinces using stratified random sampling. From a total workforce of 620 employees, a sample size of 238 respondents was determined using Krejcie and Morgan's (1970) formula and proportionally allocated across firms. Data were collected using a validated, self-structured questionnaire consisting of three sections measuring Top Management Support, Organizational Readiness, and Behavioral Intention, all rated on a 4-point Likert scale. A pilot study involving 15 respondents from a non-participating company was conducted to assess reliability, with Cronbach's alpha coefficients ≥ 0.70 considered acceptable. Ethical approval was obtained from the Institutional Review Board, and informed consent, confidentiality, and voluntary participation were strictly observed. Data collection was conducted through both online and on-site surveys. Data were analyzed using descriptive statistics (mean and standard deviation) and Partial Least Squares Structural Equation Modeling (PLS-SEM) via WarpPLS version 8 to test hypothesized relationships among study variables.

RESULTS AND DISCUSSION

1. Measuring the Perceived Top Management Support for Lean Management Adoption among Employees.

Table 1 presents the respondents' perceptions of top management support in adopting Lean Management within the manufacturing company. The overall mean score across the measured dimensions was 1.358 (SD = 0.435), indicating that employees generally perceive top management support as very low. Among the specific dimensions, the lowest perceived support was observed in Leadership Commitment (mean = 1.236, SD = 0.418), suggesting that employees feel that management's active commitment to Lean initiatives is minimal. Conversely, Empowerment and Support recorded the highest score among the dimensions (mean = 1.575, SD = 0.400), although it still falls within the "Disagree" range, indicating that employees perceive only a limited degree of empowerment and support in Lean adoption.

Table 1: Level Agreement on Top Management Support, Agreement on Organizational Readiness and Behavioral Intention to Adopt Lean Management

	Mean	Std. Deviation	Interpretation	Qualitative Descriptor
Top management Support				
Leadership commitment	1.236	0.418	Strongly Disagree	Very Low
Resource Allocation	1.288	0.452	Strongly Disagree	Very Low

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Strategic priority	1.332	0.468	Strongly Disagree	Very Low
Empowerment and Support	1.575	0.400	Disagree	Low
Composite Mean	***1.35775***	***0.4345***	***Strongly Disagree***	***Very Low***
Organization Readiness				
Change efficacy	2.514	1.171	Agree	High
Leadership support	2.967	1.073	Agree	High
Resource Availability	2.775	1.110	Agree	High
Organizational Culture	2.045	0.736	Disagree	Low
Communication Effectiveness	1.515	0.501	Disagree	Low
Employee Involvement	1.529	0.500	Disagree	Low
Training and competence	1.542	0.537	Strongly Disagree	Very Low
Composite Mean	***2.127***	***0.804***	***Disagree***	***Low***
Behavioral Intention to Adopt Lean Management				
Composite Mean	***1.915***	***1.244***	***Disagree***	***Low***
Legend: *1.00-1.49 - Strongly Disagree; 1.50-2.49 - Disagree; 2.50- 3.49 Agree; 3.50 - 4.00 – Strongly Agree*				

2. Measuring the perceived Organizational Readiness for Lean Management adoption among employees.

Table 1 presents the respondents' perceptions of organizational readiness to adopt Lean Management within the manufacturing company. The overall mean score of 2.127 (SD = 0.804) indicates that employees generally perceive organizational readiness as low. Among the dimensions assessed, Training and Competence received the lowest rating (mean = 1.542, SD = 0.537), reflecting employees' perception that they lack sufficient training and the necessary skills to effectively participate in Lean initiatives. In contrast, Leadership Support recorded the highest score (mean = 2.967, SD = 1.073), suggesting that while management is perceived to provide a moderate level of support for change, other critical aspects of readiness, such as culture, communication, employee involvement, and training, remain insufficient.

3. Behavioral Intention to Adopt Lean Management

Table 1 presents employees' perceptions of their behavioral intention to adopt Lean Management within food production companies. The composite mean score of 1.915 with a standard deviation of 1.244 indicates a generally low level of behavioral intention to apply Lean practices in daily work activities. Although the overall result reflects disagreement with Lean adoption statements, it should not be interpreted as employee resistance; rather, it suggests the presence of organizational and contextual barriers that limit effective Lean implementation (Tortorella et al., 2017).

4. Interplay model of Top Management Support, Organizational Readiness, and Behavioral Intention

Discriminant validity

Table 2 presents the discriminant validity assessment using the Fornell–Larcker Criterion, which requires that the square root of each construct's AVE (diagonal values) be greater than its correlations with other constructs. The results show that all constructs satisfy this requirement, indicating that each latent variable is empirically distinct and measures a unique conceptual domain. This supports the adequacy of the measurement model and aligns with current SEM recommendations emphasizing diagonal dominance as evidence of discriminant validity (Hair et al., 2022; Sarstedt et al., 2022).

Table 2. Discriminant Validity using Fornell and Larcker Criterion

	LC	RA	SP	ES	CC	CEF	LS	RAV	OC	CoEF	EI	TC	BI
LC	**0.767**												
RA	0.400	**0.765**											
SP	0.567	0.580	**0.838**										
ES	0.517	0.417	0.359	**0.634**									
CC	-0.013	-0.037	-0.063	0.007	**0.825**								
CEF	0.075	0.024	-0.075	0.009	0.768	**0.777**							
LS	-0.061	-0.070	-0.066	0.039	0.528	0.568	**0.912**						
RAV	-0.190	-0.160	-0.199	-0.110	0.561	0.497	0.769	**0.860**					
OC	-0.043	-0.098	-0.143	0.075	0.395	0.417	0.403	0.436	**0.724**				
CoEF	-0.013	-0.065	-0.058	0.064	0.248	0.265	0.142	0.148	0.581	**0.899**			
EI	-0.022	-0.062	-0.067	0.064	0.193	0.260	0.123	0.146	0.278	0.119	**0.913**		
TC	0.211	0.168	0.201	0.228	0.081	0.086	0.027	0.014	0.550	0.662	0.677	**0.757**	
BI	0.314	0.288	0.274	0.342	-0.026	-0.011	-0.080	-0.091	0.315	0.387	0.374	0.418	**0.860**

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Note: Diagonal elements are the square root of AVE of constructs, whereas the off-diagonal elements are the correlation between constructs

Model Fit Indices

Table 3 presents the structural model fit indices, indicating that the proposed model is statistically robust and theoretically sound. The Average Path Coefficient (APC = 0.188, p < 0.001) confirms that the relationships among constructs are significant and aligned with the hypothesized causal structure, providing meaningful explanatory power (Hair et al., 2022; Kline, 2023). The model explains a large proportion of variance in the endogenous variables, as evidenced by the Average R-squared (ARS = 0.755, p < 0.001) and Average Adjusted R-squared (AARS = 0.742, p < 0.001), reflecting strong predictive accuracy (Sarstedt et al., 2021; Henseler, 2020). Collinearity diagnostics demonstrate stability, with the Average Block VIF (AVIF = 3.973) and Average Full Collinearity VIF (AFVIF = 4.195) below the recommended threshold of 5.0, indicating minimal multicollinearity (Kock, 2021). The Tenenhaus Goodness-of-Fit (GoF = 0.707) is classified as large, confirming that both measurement quality and structural relationships are satisfactory. Overall, the model is reliable, valid, and suitable for generating meaningful theoretical and practical insights for Lean adoption in organizations (Tenenhaus et al., 2005; Henseler, 2020).

Table 3. Model Fit Indices

	Value	P-value	Interpretation
Average path coefficient (APC	0.188	<0.001	Significant
Average R-squared (ARS)	0.755	<0.001	Significant
Average adjusted R-squared (AARS)	0.742	<0.001	Significant
Average block VIF (AVIF)	3.973		Acceptable
Average full collinearity VIF (AFVIF)	4.195		Acceptable
Tenenhaus GoF (GoF)	0.707		Large

Legend: AVIF - acceptable if <= 5, ideally <= 3.3; AFVIF - acceptable if <= 5, ideally <= 3.3, P-value < 0.001 – Significant

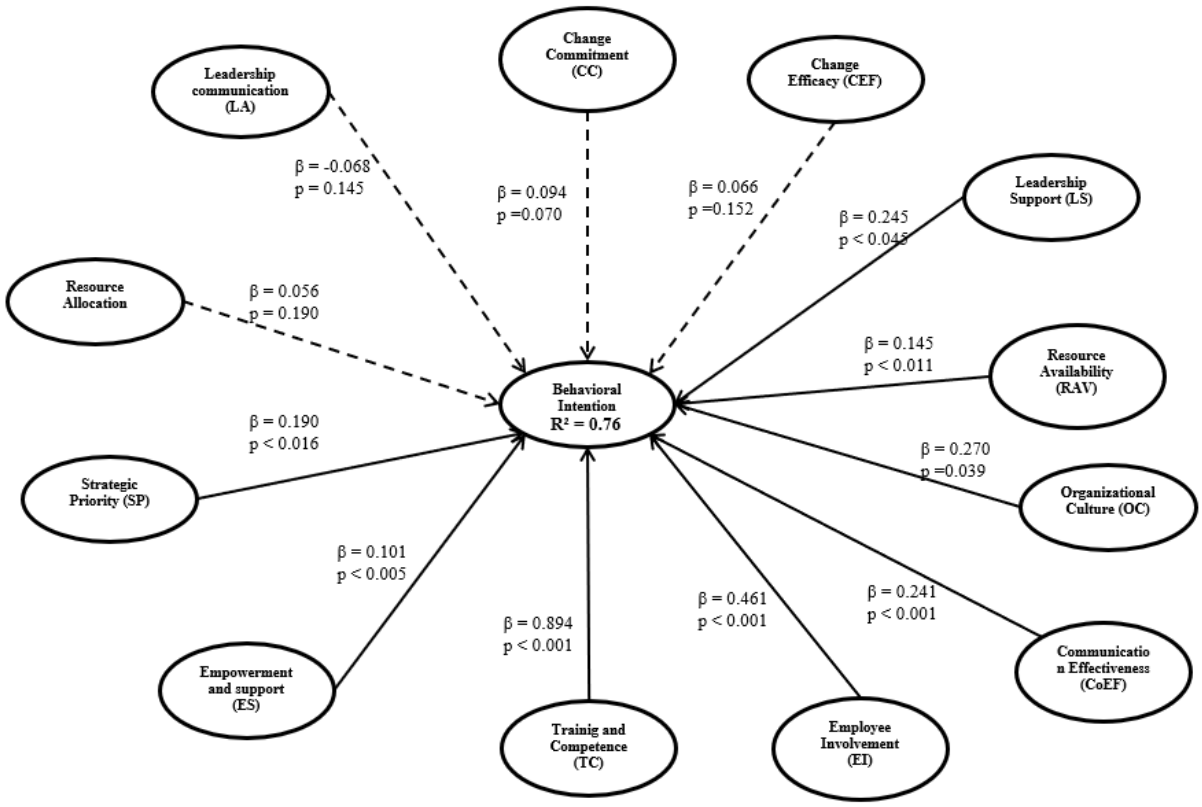


Figure 3: Structural Model

5. Strategic framework for enhanced behavioral intention to adopt lean Management in Rwanda.

The strategic framework illustrates how Top Management Support and Organizational Readiness shape employees' Behavioral Intention to adopt Lean Management in Rwandan manufacturing firms. It emphasizes that clear leadership prioritization, employee empowerment, supportive organizational culture, adequate resources, effective communication, staff involvement, and proper training collectively enhance

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willingness to implement Lean practices. The framework provides actionable guidance for management, identifying key areas for intervention to strengthen leadership actions and organizational systems, thereby promoting successful and sustainable Lean adoption.

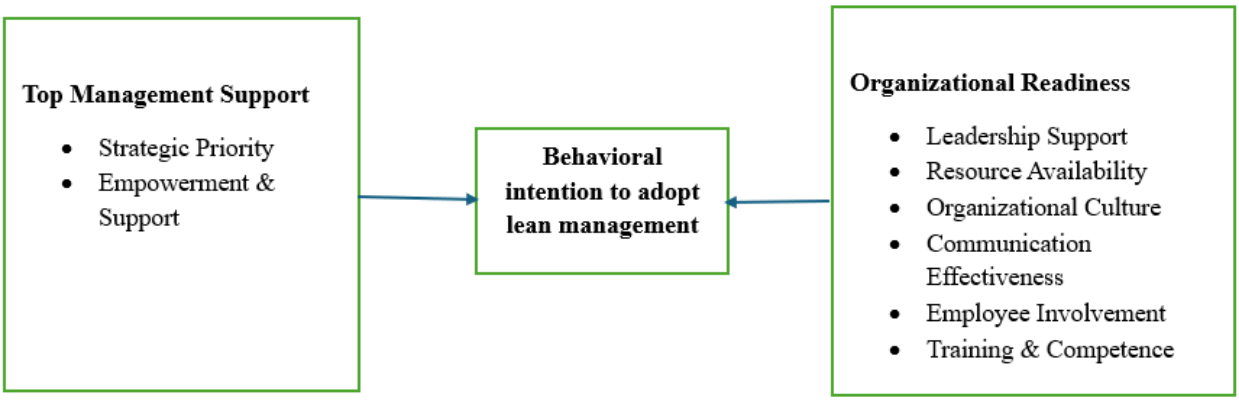


Figure 4: Strategic framework

DISCUSSION

The study findings indicate that top management support for Lean Management adoption is generally low, particularly in terms of leadership commitment, resource allocation, and strategic prioritization. Employees perceive that leaders are insufficiently engaged in championing Lean initiatives, with limited clarity in expectations and minimal active involvement in improvement processes. This weak leadership commitment aligns with prior studies emphasizing that managerial accountability, visible engagement, and strategic guidance are critical for embedding Lean principles into organizational culture rather than treating them as isolated projects (Mann, 2023). In resource-constrained environments such as Rwandan manufacturing, insufficient allocation of financial, human, and infrastructural resources further undermines employee confidence and the sustainability of Lean initiatives.

Closely related to leadership involvement is empowerment and support, which employees also perceive as limited. Although some level of decision-making autonomy exists, recognition for Lean contributions and encouragement to participate in initiatives are minimal. This finding is consistent with research indicating that empowerment through delegation, recognition, and participatory decision-making is essential for fostering motivation, ownership, and active engagement in Lean transformation (Torres et al., 2022). Without such empowerment, Lean is likely perceived as a top-down, symbolic initiative rather than a shared organizational philosophy.

The analysis of organizational readiness reveals mixed perceptions across dimensions. While employees report relatively higher individual change efficacy and some degree of leadership support, overall readiness is constrained by low scores in change commitment, organizational culture, communication effectiveness, employee involvement, and training and competence. The inconsistency between individual confidence and collective team readiness suggests that psychological readiness is unevenly distributed, highlighting gaps in shared vision, coordination, and team-level engagement (Shanti, 2025). These gaps may hinder the internalization of Lean practices, particularly in organizations with hierarchical structures and low participatory culture.

Resource availability and leadership support emerged as relatively stronger aspects of readiness. Employees perceive that planning systems and material resources moderately support Lean initiatives, and that leaders provide some empowerment and mentoring. However, deficiencies in staffing adequacy, skills development, and continuous training limit the effective utilization of these resources. Prior studies confirm that both tangible and human resources, coupled with leadership oversight, are critical for sustaining Lean improvements (Patri et al., 2021). In the Rwandan context, addressing these human resource gaps is particularly important to complement existing infrastructure and planning mechanisms.

Organizational culture, communication effectiveness, and employee involvement are major barriers to readiness. Employees report a misalignment between existing organizational culture and Lean values, limited open communication, and minimal participatory decision-making. Such deficiencies restrict the development of a continuous improvement mindset and reduce engagement with Lean initiatives (Samul, 2019). Strengthening culture, enhancing transparent communication, and fostering inclusive practices are therefore essential to create an environment conducive to sustainable Lean adoption.

Finally, behavioral intention to adopt Lean Management is low despite recognition of potential benefits. Employees' attitudes toward Lean are moderately positive, but limited training, unclear role expectations, and insufficient managerial guidance constrain their ability to act on these intentions. According to the Theory of Planned Behavior, low perceived behavioral control can inhibit action even in the presence of favorable attitudes (Benkarim & Imbeau, 2021).These findings highlight the interdependence of top management support, organizational readiness, and individual capability in shaping Lean adoption. To enhance adoption outcomes, organizations must simultaneously strengthen leadership commitment, resource allocation, empowerment, training, communication, and cultural alignment.

CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

This study investigated how Top Management Support (TMS) and Organizational Readiness (OR) influence employees' Behavioral Intention (BI) to adopt Lean Management in Rwandan food manufacturing companies. Results revealed that most TMS dimensions, including Leadership Commitment and Resource Allocation, were rated very low, whereas Strategic Priority and Empowerment & Support significantly

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predicted Lean adoption. Organizational Readiness dimensions showed mixed levels: Leadership Support, Resource Availability, and Change Efficacy were high, while Organizational Culture, Communication Effectiveness, Employee Involvement, and Training & Competence were low. Statistical analysis confirmed that OR components, particularly Training & Competence, strongly shaped employees' BI, whereas psychological readiness alone (Change Commitment and Change Efficacy) was insufficient for Lean adoption. Overall, the BI to adopt Lean Management was low, highlighting gaps in empowerment, communication, and skills development.

The study concludes that Organizational Readiness is a decisive factor in employees' willingness to adopt Lean Management, supported by targeted elements of Top Management Support. Leadership commitment and resource provision alone do not directly drive adoption; instead, effective TMS manifests through strategic prioritization and employee empowerment. Lean thrives in environments with supportive leadership, adequate resources, participatory culture, clear communication, and continuous training. Strengthening structural, cultural, and capability-based readiness is essential for fostering sustainable Lean adoption in Rwandan manufacturing firms.

Manufacturing firms should formalize Lean strategies, establish Continuous Improvement units, and promote employee involvement through Kaizen teams and suggestion systems. Policymakers and regulatory bodies should create enabling frameworks, provide fiscal incentives, and mandate Lean leadership certification. Academic institutions are encouraged to integrate Lean into curricula and foster hands-on training collaborations with industry. Future research should examine mediating factors, including digitalization, market pressure, and technological readiness, to further understand determinants of Lean adoption and operational excellence in Rwanda.

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