

THE LEAN MANAGEMENT PRACTICES, GEMBA PRACTICES, AND LEAN LEADERSHIP RELATIONSHIP WITH SUSTAINABILITY PERFORMANCE OF THE NATIONAL BANK IN OMAN: AN ANALYTICAL STUDY OF VARIABLES

Ali Sulaiman Ali AL-Rusheidi^{1*}, Kamisah Binti Supian²

¹Ph.D. candidate in Management, Faculty of Business and Accountancy, University Selangor Malaysia

²Dr, Senior lecturer at the Faculty of Business and Accountancy, University Selangor Malaysia

*Correspondent Author

Abstract

The main objective of the study; is to analyze the relationships that connect the main variables: Lean management practices and Gemba practices on the dependent variable sustainable performance, through the Lean Leadership as an intermediate variable. The research follows a descriptive research design. A simple random technique was used to obtain (30) respondents; (15) management personnel and (15) employees acquainted. The questionnaire consists of (56) statements distributed in (4) sections; each section consisted of (14) statements. The data analysis process incorporated the use of software such as SPSS and SmartPLS. Partial least squares structural equation modelling (PLS-SEM) is used to test the hypotheses of the research model. PLS regression will enable the mapping of the direct and mediating effect between the variables. The findings revealed that: the Gemba Practices, Lean Leadership and Lean Management Practices can explain 39.4% of the variance in Sustainability Performance. there is a medium effect size of Gemba Practices (0.238) on the Sustainability Performance. Likewise, the findings reveal that there is a small effect size of Gemba Practices and Lean Management Practices on the Lean Leadership with values of 0.075 and 0.094 respectively. In addition, the findings reveal that there is a small effect of Lean Leadership on Sustainability Performance construct with value of 0.046, and no effect of Lean Management Practices on Sustainability Performance.

Keywords: lean management, Gemba practices, lean leadership, sustainable performance.

1. INTRODUCTION

This study explores the important constructs of lean management practices, Gemba practices, lean leadership, and the sustainability performance of Oman National Bank. To further extend the knowledge of lean management practices, Gemba practices, lean leadership, and the sustainability performance of Oman National Bank, the components are discussed and constructed based on the confirmation from the experts and previous studies of lean. In this study, lean management practices and Gemba practices are considered as an independent (predictor) variable and sustainability performance as a focal dependent (criterion) variable.

The unit of analysis in this study is the employees of the National Bank of Oman in Muscat, where most

employees of the National Bank of Oman work. The respondents are the individual who is working at National Bank of Oman in Muscat. To ensure a reliable source of information, the respondents with sufficient knowledge in lean matters are chosen and provided unbiased opinions.

Lean management practices are policies for permanent development within the institution without compromising the level of quality. What is required, as it is concerned with searching for the optimum utilization of human and material resources (Emmanuelle, 2019, P. 177). A set of practices for a philosophy aimed at changing management style, behaviors, ways of thinking of people and organizational cultures, to achieve better results.

Gemba Practices apply the method of progressive continuous development on what is taking place within the site of events and operations and generate real value on the ground (Imai, 1986, P. 5). Continuous training improvement in all respects, so that all workers participate in the improvement process and at all administrative levels, regardless of their job positions from senior management to the cleaning agent in it.

Lean Leadership is a set of actions that must be performed correctly and in a correct sequence at the correct time to create value for a specific customer to obtain the desired addition with quality Required (Womack, 2007, P. 4). It is a system concerned with eliminating all forms of waste present in all production processes by practicing a policy of permanent development within Enterprise.

Sustainable Performance; A measure for improving industries and integrating them into effective business strategies through process improvement, benchmarking, progress tracking, and evaluation process, with the aim of building an appropriate index of sustainability (Martins et al, 2007, P. 2962). Continuous reporting on economic, environmental, and social performance and comparing them with sustainability indicators to create positive value within the organization.

1.1 Problem Statement

As of late, and particularly in the wake of the overall monetary downturn banks have been exposed to developing outside pressures which when combined with the interior requirements of the banking structure, have stimulated the occurrences of a number of difficulties on their operations. In order to flourish in this era of the new business climate and guarantee sustainability performance in the banking industry, in both the medium and long haul, more organizations are zeroing in on the oppression of new administration procedures that give more productive and savvy administrations without endangering the quality of the products or services rendered from the clients' point of view.

The impact of external powers and internal imperatives have encouraged a change in perspective in the financial services industry. The worldwide economic and monetary recession influenced the macroeconomic climate and as an outcome, has affected adversely organizations' outcomes and monetary circumstances, raised severe legislative guidelines and spread a worldwide environment of vulnerability and doubt towards banks. Similarly, there is evident need to shuffle the possibilities of improvement of the client relationship model, to empower the gathering of current customer's necessities, and face expanding serious pressing factors, particularly with the development of new players and problematic arrangements in the monetary market. The new climate has set off a resurgence in the significance in inspiring banks to centre their business execution in a manner that will lessen operational expenses, reduce wastage yet hold manageable and sustainable competitive advantage over the other players in the industry.

Lean management practices have been progressively seen by banking administrations and operational heads as a reasonable answer for upgrade, having an upper hand over other financial institutions and improving the execution details of banking organizations. Yet, notwithstanding its acclaimed achievement, particularly when applied to manufacturing organizations from where the practices originate from, the implementation of lean management practices in the banking industry actually presents new difficulties and snags that may even trade off its viability.

1.2 Research Objectives

The main objective of the study; is to analyze the relationships that connect the main variables: Lean management practices and Gemba practices on the dependent variable sustainable performance, through the Lean Leadership as an intermediate variable.

2. LITERATURE REVIEW

2.1 Lean Leadership

Dombrowski and Mielke (2013) describe lean leadership as the link that exists to provide create a sustainable and continuously growing organization. Lean leadership is a methodological framework for the

sustainable application and quality improvement of LPS. Perfection using this methodological framework is achieved through the collaboration between workers and their representatives. This involves having a goal-oriented approach that targets long-term growth of the staff and the executives while laying huge emphasis of client operations.

This is a systemic practice designed for long-term deployment and daily progress of lean implementation. It applies to including all staff in the daily activities of their companies. This involves an emphasis on consumer desires in all systems, as well as long-term growth for managers and executives. A core concept of lean leadership is improvement culture, which allows leaders to actively criticize existing procedures in order to change them (Gertrude, 2018).

A sensei is a guide for both workers and management in self-development. Brief workshops and courses are used to constantly further one's self-development. In addition, lean leaders will use regular training to build up others (Dombrowski & Mielke, 2013). Employee credentials are an essential prerequisite since they encourage workers to engage in minor change programs with procedures in the company, which goes hand in hand with the continuous growth of employees and leaders. Qualification encompasses more than just a degree of education; it also includes experience and expertise in particular fields. The bulk of lean leadership research and teaching occurs on a regular basis and occurs where the real work is done, such as on the factory floor. Strategic management deployment is often part of lean leadership at various stages that are checked in periodical conferences to ensure that improvement steps are monitored and progressing in the right direction (Khan et al., 2019).

The goal of any organization is to ensure that they deliver the best product and services to their clients while reducing the cost to the minimum amount. The traditional leadership tactics heavily rely on a decision-making process that is centralized and the micro-management of the employees (Grewan, 2019). This limits the creativeness of the employees, and they never do anything beyond what is expected. Lean leadership takes a different approach that challenges every person to do better in their respective line of work, hence more efficient ways of working and thus continuous development. This paper focuses on lean leadership and the model it follows to ensure maximum value in the most efficient manner.

2.2 The lean leadership models

The goal of the lean leadership model is to develop or to raise new leaders in an organization. The lean leadership model has five steps that should be followed for successful lean leadership in an organization. These are;

a) Challenge the employees on individual/team level: Every team or individual in the organization or under the leader needs to be challenged so that they can look for better, more efficient ways of carrying out their task. Grewan, (2019) states that under lean management, the leader should ask more questions rather than provide answers for the team. By asking questions, the team can develop real solutions by themselves with a little support and guidance from the leader. This also increases the trust between the team and the leader.

b) Develop a Kaizen mindset: The kaizen mindset focuses on solving problems without necessarily following the laid down instructions. This is developed from the aspect of continuous self-development where the individual continuously improves themselves. This could be either through taking a new course or learning a new skill that will enable them to perform better (Alefari, Salonitis, & Xu, 2017). As the leader, one can facilitate this by ensuring there are adequate resources to facilitate the self-development of the team. In addition to that, one should guide the team during experimentation when looking to address a particular problem.

c) Get in touch: It is important to get in touch with each individual and the team as frequently as possible. The importance of this is that it allows one to dig and know the causes of the problems being experienced and thereby get a solution that fully solves the problem instead of a quick-fix (Alefari, Salonitis, & Xu, 2017). In addition to that, it helps reduce time and resource wastage in the organization.

d) Facilitate teamwork: Teamwork in an organization allows the organization to achieve its goals and bring its vision to reality. In lean leadership, the leader should stress the importance of teamwork, else, he or she will have highly skilled and motivated people all with different agendas (Alefari, Salonitis, & Xu, 2017). The leader should help the team see the vision of the organization and make their contribution towards it.

e) Show respect: While working as a team, it is important to ensure respect is maintained as the work done by a team cannot be done by an individual alone. In addition to showing respect to each other, the respect should be extended to the opinions that other team members have, personal limits, and the extent of challenging the decisions made by the leader (Aij, & Teunissen, 2017).

2.3 Sustainability Performance Sustainability

has emerged as a critical method for guiding the globe's social development as well as economic transition. However, there are sometimes distortions in the rehearsal phase. In relation to sustainability theory, such misunderstandings are illustrated in the conflict between strong and weak development paths, and a lack of viable long-term growth paths, as well as a misunderstanding of the idea of intergenerational as well as intergenerational justice (Kantabutra, 2019). The research survey design, inference method, and qualitative analysis were used to explain the mechanism of slow development and growth of the definition and goal of sustainable performance, in order to improve overall understanding of the sustainability theory.

2.3.1 Relationship between Lean Management Practices and Sustainability Performance

The principle of lean management is aimed at eliminating the waste of time, money and commitment focused towards the achievement of development objectives. Lean practices are accomplished by identifying the market operation and its sources as well as its output, isolating the divisions that absorb with a higher input factor and leaving out the branch to remove waste from that branch.

H1: *There exists a relationship between Lean Management Practices and Sustainability Performance.*

2.3.2 Mediating effect of Lean Leadership in the relationship between Lean Management Practices and Sustainability Performance

Albliwi, et. Al., (2014) completed a systematic literature analysis of 56 articles written on Lean Six Sigma in a well-known scholarly database from 1995 to 2013. Lack of top management mindset, dedication and engagement has been described as the most critical factors for the failure of Lean Six Sigma in their study as identified in 20 of the reports. This aspect has been shown to be harmful to all sectors in various countries and different organizational sizes. Indeed, the task of top management is to ensure that all the pertinent resources are available and without hindrance during Lean deployment.

(Sloan et al., 2014b) recommended that senior management be responsible for realizing the positive participation of staff in the process of change and encouraging the tools needed to enable adoption. The tools required for Lean's introduction, such as time for staff preparation and participation in Lean's events, must be given. In accordance with the studies referred to above, the following theory is set out:

H2: *There is a mediate effect of lean leadership on sustainability performance through lean management practices.*

2.3.3 Mediating effect of Lean Leadership in the relationship between Gemba Practices and Sustainability Performance

According to (Zhu, Johnson, & Sarkis, 2018), it is necessary for top management to consider and have sufficient support for the definition of Gemba. Lack of dedication can lead to a host of other problems, including inadequate access to resources, lengthy decision-making processes and break-downs in communication. Gemba wants creative administrators with forward-thinking insight and laxity to allow the workers a leeway to experiment. Management must eliminate the restraining power by empowering people to be interested in the adoption of Gemba and allowing them to take action without having to obey conventional decision-making procedures, (Jadhav, Mantha, & Rane, 2014). On the other side, leadership must express respect and understanding for the interests and wishes of its workers (internal customers). Once internal customers are safe, they can strengthen procedures and entertain external customers, (Fok-Yew, 2018). In general, the expectation in this study is as follows:

H3: *There is a mediating impact of lean leadership on sustainability performance by Gemba procedures.*

2.3.4 Relationship between Lean Management Practices and Lean Leadership

Lean does not have a leadership framework, and no experiments link results to the Lean leadership paradigm. However, (Aij, Visse, & Widdershoven, 2015) offers a valuable Lean management framework that facilitates the effective adoption and durability of Lean. Identifying leadership attitudes and behaviours that serve leaders in this practice environment will help them promote the professional development and value of their colleagues. The goal of this study was to recognize and describe leadership criteria and characteristics that are necessary to help organizations through Lean transition. As a result, the expectation hypothesis in this study is:

H4: *There exists a relationship between Lean Management Practices and Lean Leadership*

2.3.5 Relationship between Gemba Practices and Lean Leadership

While Gemba methods are considered simple to adopt during the initial phases of the process, few organizations are able to sustain them in the long term. The role played by the leaders is one of the primary reasons for this maintenance. (Poksinska, Swartling, & Drotz, 2013) concluded that, while the Gemba methods are easy to introduce, few businesses tend to become real Gemba companies, that is, produce positive initial results and struggle in long-term maintenance. Workers in organizations practising Gemba, when successfully applied, are guided by the principles of the leaders and the leaders are seen as guidelines to the behaviour of the staff, (Van Dun & Wilderom, 2016), in addition to the importance of the leader as a reference for other employees. The implementation of Gemba practices may result in a reduction in waste, but sustainability and maintenance of changes and the development of a culture of change are accomplished by practices that promote learning, information sharing and a sense of teamwork between workers, and for this, lean leadership is crucial. In view of these, the following hypothesis was postulated:

H5: *There exists a relationship between Gemba Practices and Lean Leadership*

2.3.6 Relationship between Gemba Practices and Sustainability Performance

Gemba practices have gained a high level of acceptance in recent years, even though their substance and context are not fresh. The Gemba model was originally developed in Japan by Shigeo Shingo and Taiichi Ohno, where it was known as the Toyota Production System. Gemba provides many techniques/tools to support organisations in the elimination of waste. Several authors say that these tools also seem to have an impact on sustainability performance, especially in manufacturing companies, (Chiarini, 2014). Due to the emphasis, for the most part, on progressive reform and creativity, many companies struggle to enhance their environmental success successfully, resulting in the subsequent erosion of changes and the regression of prior activities. Using Gemba-Kaizen as a foundation for sustainability will provide sustainable outcomes through the full participation of companies.

H6: *There exists a relationship between Gemba Practices and Sustainability.*

3. RESEARCH METHODOLOGY

The research design follows a descriptive research design. The descriptive research design obtains data from all participants in the population and seeks to provide a proper measure of the variables in the population. Descriptive studies are always handled with the hypothesis which is clearly defined or investigative questions, and they serve several objectives in the study which include making descriptions of phenomena or characteristics associated with a subject, making estimates of the proportions of the population that have these characteristics, and also the discovery of associations among different variables which is sometimes referred to as a correlation study, a subset of descriptive studies (Ssesagawa, 2014).

3.1 Data Collection

This research integrated quantitative research design. The primary method induced the use of structured questionnaires that was developed on literature from scholars subject to the mediation of lean leadership towards lean management practices, gemba practices and sustainability performance.

3.2 Sampling

The study population consisted of the employees of the National Bank of Oman in Muscat, a simple random technique was used to obtain a sample size of 30 respondents; 15 management personnel and 15 employees acquainted.

3.3 The study Questionnaire

The questionnaire consists of the demographic data, and four sections; each section consisted of (14) statements:

- a) The first part identifies the lean management practices and its relationship to sustainability performance at the National Bank of Oman. It consists (7) statements for the supplier relationship management, and (7) statements for customers' relationship management.
- b) The second part identifies the gemba practices and models adopted in the structure of the National Bank of Oman. It consists (7) statements for Engagement and (7) statements for Communication.
- c) The third part the sustainability performance was evaluated from an objective view enquiring about its relationship between lean leadership and lean management practices. It consists (7) statements for culture improvement and (7) statements for self-development.

d) The fourth section, the dependent variable: Sustainability Performance that consists (7) statements for economic performance and (7) statements for social performance.

3.4 The questionnaire's Validity and Reliability

In addition to the notes of the (6) arbitrators on the apparent validity; the researcher used the internal consistency test to verify the stability of the study tool. To find out the internal consistency, the questionnaire was applied to a small sample. The value of Cronbach's alpha that extracted from a score (0.9) indicates excellent reliability of the tool. When the result ranges between (0.9) to (0.8) it is judged to be acceptable and good value. A score less than (0,7) is a weak value. While the value of less than (0.5), is unacceptable result (Siddique, 2012).

Internal consistency reliability (reliability of constructs) was the second criteria assessed in evaluating the measurement model. Two measures were employed to evaluate the internal consistency reliability namely composite reliability and Cronbach's alpha. The values of composite reliability and Cronbach's alpha should be more than 0.70 to achieve internal reliability consistency (Ringle et al., 2012).

Table (1): Internal consistency for reflective constructs

Construct	Cronbach's Alpha	Composite Reliability
Communication	0.885	0.911
Culture Improvement	0.781	0.857
Customer Relationship Management	0.900	0.923
Economic Performance	0.908	0.926
Engagement	0.804	0.865
Self-development	0.806	0.860
Social Performance	0.822	0.883
Supplier Relationship Management	0.867	0.901

Based on Table (1); internal consistency reliability was achieved as the values of composite reliability and Cronbach's alpha for all constructs in this study were above 0.70. This indicated that internal reliability is established, and the items used to represent the constructs were reliable.

3.5 Data Analysis Techniques

The data analysis process incorporated the use of software such as SPSS and SmartPLS. The mediation effect within the variables was tested using partial least squares where the relationships between the mediator variables were identified together with their corresponding p-values. The validity of these values is done by conduction correlation studies on the data to obtain the significance of the values relative to the hypotheses under study.

Partial least squares structural equation modelling (PLS-SEM) is used to test the hypotheses of the research model. PLS regression will enable the mapping of the direct and mediating effect between the variables namely, sustainability performance, lean management practices, lean leadership and gemba practices. PLS is advantageous in providing the latent constructs and provides two measurements, namely the inner (structural components to the variables) and the measurement of the external variables.

4. DATA ANALYSIS AND FINDINGS

To analyse the collected data, a pre-processing step is involved, so that the data is cleaned and transformed to improve its quality, which is called data preparation. Data preparation is a process in which the raw data is converted to a usable and ready for analysis format. This includes data entry, coding, tabulation and validation (Hair et al., 2014). Accordingly, data preparation involves data screening and missing data,

outliers' manipulation, data normality, and common method bias assessment.

4.1 Data Screening

Missing data is typically one of the most problems in research studies that highly rely on survey method for data collection. Missing data usually happen when the respondent fails to answer one or more question(s). According to the literature, if the amount of missing data for a particular response exceeds 5%, the response is usually removed from the data (Hair et al., 2014 ; Hair et al., 2016). After the initial data screening process using SPSS 25, it has been noticed that, no missing values have been detected.

4.1.2 Detection of Outliers

An outlier in a survey data signifies the numbers that exceed the majority of answers, where there are two types of outliers which include univariate and multivariate. The univariate is assumed if SPSS regression produces a result of unusual value in a single variable that exceeds the number of case acceptance, which is usually less than -3.29 or greater than +3.29. In this case, these records should be removed from the data set and considered as a univariate element. An initial investigation of the survey data in SPSS suggests that there were 9 cases that exceeded ± 3.29 based on their z score records as shown in Appendix B (Hair et al., 2013). Similarly, in another SPSS regression, there is no cases that were classified as multivariate identified by checking the Mahala Nobis distance (MD) were $p < 0.001$. Therefore, after the check for outliers, a final 129 out of 138 was used for this study.

4.1.3 Common Method Variance

Common method variance (CMV) or Common method bias (CMB) refers to the amount of fake covariance shared among the variables that is resulted due to the common method utilized for data collection (Kock, 2015). The effect of CMV is very important as it may introduce potential errors in the measures (Podsakoff, et. al., 2003). In this study, the Harman's single-factor test was used to check for the possibility of CMB existence. We can observe that the highest variance value was 23.349 % for the collected data, which is less than 50%. Thus, there is no existence for the CMB in both samples.

4.1.4 Testing for Normality

According to the literature, PLS-SEM does not involve the data to be normally distributed (Hair et al., 2016). On the other side, it is essential to verify that the data are not too far from normal, as extremely non-normal data expose problematic in the evaluation of the parameters' significances. There are various normality tests used in statistics. When using PLS-SEM as a statistical tool the data can either be normal or not normal distribution (Hair et al., 2014). In addition, in PLS bootstrapping is used to avoid any type of non-normal distribution. However, the assessment of Kurtosis value requires that the value should be lesser than +3 or lesser than -3 for the data to be normal distribution (not peak or flat). Likewise, for the skewness, the value should not exceed +3 or be less than -3 to be normal (Peat & Barton, 2008). The normality test results are all within the acceptable limits.

4.2 Descriptive Statistics of Respondents Demographic Profile

For the employees in the National Bank of Oman, frequency and percentage distribution of the survey respondents, as well as their respective enterprise characteristics are presented which depicts the characteristics of the 129 usable responses including gender, age, Academic Qualification, Job experience, and experience as shows in table 2.

Table 1: Respondents Profiles

Variable	Data	Frequency	Percent
Gender	Male	54	41.9
	Female	75	58.1
Age	26-50 years	125	96.9
	50 years or more	4	3.1
Academic Qualification	Higher Education Diploma	36	27.9

	College Diploma	33	25.6
	Bachelor's Degree	50	38.8
	Master's Degree	9	7.0
	Doctorate	1	0.8
Job experience	0-1 year	3	2.3
	2-5 years	23	17.8
	6-10 years	32	24.8
	10+ years	71	55.0
experience	0-1 years	19	14.7
	1-3 years	25	19.4
	3-5 years	18	14.0
	5+ years	67	51.9
	Total	129	100.0

4.3 Research Model Assessment

The Structural Equation Modelling (SEM) was employed using SmartPLS software version 3 to verify the proposed model and test hypotheses relationships. According to Karimimalayer (2012), SEM has the ability of evaluating model construct relationships simultaneously. According to (Hair et al., 2013 ; Hair et al., 2016), validating a model using PLS involves two-step approach; measurement model assessment and structural model assessment. The criteria used in assessing the measurement as well as structural models of this study will be addressed in the next subsections.

4.4 Assessment of Hierarchical Component Models

In the current study, Gemba Practices, Lean Management Practices Lean Leadership, and Sustainability Performance measured as a formative second-order constructs with eight first-order reflective constructs. The eight first-order constructs are: Communication, Culture Improvement, Customer Relationship Management, Economic Performance, Engagement, Self-development, Social Performance, and Supplier Relationship Management are measured by reflective indicators respectively. This study follows the suggestion of Chin (1998) to examine the reliability and validity of the measurement model at the second order. As recommended by (Ringle et al., 2012) a mixture of the repeated indicator approach and the use of latent variable scores (LVS) in a two-stage approach should be applied to establish the second-order construct which is necessary to assess the measurement model of the model that including formative constructs. The two-stage approach is required for endogenous formative constructs that are part of the structural model in addition to the HOC constructs (Hair et al., 2016).

4.4.1 Path Coefficients

This phase of the analysis in PLS-SEM involves the estimation of the magnitude and significance of path coefficients of the model hypotheses and their corresponding t-values were evaluated through the SmartPLS by employing bootstrapping technique based on 5,000 re-samples as recommended by (Chin, 1998 ; Hair et al., 2016). Accordingly, the author examined the path coefficient (β) measures in testing all three hypotheses presented in the first structural model. Thus, according to Hair et al (2016), the path coefficient value for each relationship or hypothesis should have a value between -1 and +1. Besides, if the path coefficients value is close to +1 it suggests that there is a significantly positive correlation between the two constructs. Similarly, if the path coefficients value is close to -1 it mainly suggest that there is a significantly negative

correlation between the two constructs (Hair et al., 2016). Therefore, in this study, the path coefficient value is employed to measure the significant level of the hypotheses in the proposed model. Results reveal that the path coefficient estimates which indicate that the relationships between among the hypothesized constructs are small, medium and large since the value ranged from -0.021 to 0.515, at the $p < 0.005$ level in table 3

Table 2: Path Coefficients and T-Statistics Analysis

Relationship	β	t-value	p-values
Gemba Practices -> Lean Leadership	0.295	2.715	0.003
Gemba Practices -> Sustainability Performance	0.515	4.512	0.000
Lean Leadership -> Sustainability Performance	0.202	2.193	0.014
Lean Management Practices -> Lean Leadership	0.330	2.818	0.002
Lean Management Practices -> Sustainability Performance	-0.021	0.194	0.423

4.4.2 Coefficient of Determination (R^2)

The determination coefficient (R^2) is used to calculate the structural model's predictive power. Specifically, it means the amount of variation in the dependent variable explained by all of the related independent variables. As shown in the results of R^2 values of endogenous constructs are 0.321 and 0.394 for Lean Leadership and Sustainability Performance, table 4.

The endogenous construct of Lean Leadership explained by the exogenous constructs of Gemba Practices and Lean Management Practices with the variance of 32.1%. Similarly, the Gemba Practices, Lean Leadership and Lean Management Practices can explain 39.4% of the variance in Sustainability Performance. In overall, the variances in all endogenous constructs that explained by exogenous constructs are acceptable.

Table 3: R Square for Endogenous Constructs

Endogenous Constructs	R Square	R Square Adjusted
Lean Leadership	0.321	0.310
Sustainability Performance	0.394	0.379

4.4.3 Effect Size (f^2)

Unlike (R^2), the effect size (f^2) measures the amount of variance in the endogenous constructs explained by each single exogenous construct. In another words, the effect size analysis is used to measure the amount of change in R^2 value when a specified exogenous construct is omitted from the model, whereby evaluating the amount of substantive impact on the endogenous constructs from the omitted construct. In assessing f^2 values the endogenous constructs should be between the values of 0.02, 0.15, and 0.35 respectively, represent small, medium, and large effects of the exogenous latent variable, where an effect size values of less than 0.02 indicates that there is no effect (Cohen, 1988 ; Hair et al., 2016).

In this regard, represents the effect size of the proposed structural model. The results show that there is a medium effect size of Gemba Practices (0.238) on the Sustainability Performance. Likewise, the findings reveal that there is a small effect size of Gemba Practices and Lean Management Practices on the Lean Leadership with values of 0.075 and 0.094 respectively. In addition, the findings reveal that there is a small effect of Lean Leadership on Sustainability Performance construct with value of 0.046, and no effect of Lean Management Practices on Sustainability Performance construct in table 5.

Table 4: F Square for Endogenous Latent Variable

Path	f ²	Effect size
Gemba Practices -> Lean Leadership	0.075	Small Effect
Gemba Practices -> Sustainability Performance	0.238	Medium Effect
Lean Leadership -> Sustainability Performance	0.046	Small Effect
Lean Management Practices -> Lean Leadership	0.094	Small Effect
Lean Management Practices -> Sustainability Performance	0.000	No Effect

4.5 Summary of the Hypotheses Evaluation

PLS-SEM was utilized to test the hypothesized structural model, which included a test of the overall model as well as individual tests of the relationships among the latent constructs. Thus, the path estimates between the model latent constructs and T-statistics and associated p-values were examined by applying bootstrapping with 5000 replications with the aim of supporting or rejecting each research hypotheses as recommended by (Hair et al., 2016). This study opted for 5000 sample when applying bootstrapping procedure to avoid bias standard errors due to non-parametric distribution in determining the confidence intervals of the path coefficients and statistical inference (Tenenhaus et al., 2005 ; Wong, 2013). Summarizes the results of all the hypothesized relationships testing among constructs in this study in table 6.

Table 6: the results of all the hypothesized relationships testing among constructs

Hypotheses	Relation	Path Coefficients	T-value	P-value	Decision
H1	Lean Management Practices -> Sustainability Performance	-0.021	0.194	0.423	Not Supported
H2	Gemba Practices -> Sustainability Performance	0.515	4.512	0.000	Supported
H3	Lean Management Practices -> Lean Leadership	0.330	2.818	0.002	Supported
H4	Gemba Practices -> Lean Leadership	0.295	2.715	0.003	Supported
H5	Lean Leadership -> Sustainability Performance	0.202	2.193	0.014	Supported
H6	Lean Management Practices -> Lean Leadership -> Sustainability Performance	0.067	1.819	0.034	Supported
H7	Gemba Practices -> Lean Leadership -> Sustainability Performance	0.060	1.544	0.061	Not Supported

Correspondingly, depicts the results of hypotheses testing for the research model hypotheses based on the path coefficients, T-value, and significance levels. The findings show that five out of seven hypotheses are accepted by passing all assessment criteria. Accordingly, the results of path analysis in relation to the above hypotheses (H1, H2, H3, H4, H5, H6 and H7) in the structural model are explained as follows in table 6:

Hypothesis1 (H1) states that, there is a positive relationship between Lean Management Practices and Sustainability Performance. The results of path coefficients obtained show that there is no relationship between Lean Management Practices and Sustainability Performance with $\beta = -0.021$ at t-value = 0.194 ($p >$

0.05). Therefore, H1 is not supported.

Hypothesis 2 (H2) posited that there is a positive relationship between relationship between Gemba Practices and Sustainability Performance. The results of path coefficients obtained show Gemba Practices has strong significant relationship with Sustainability Performance with $\beta = 0.515$ at t-value = 4.512 ($p < 0.001$). Therefore, H2 is accepted.

Hypothesis 3 (H3) states that there is a positive relationship between Lean Management Practices and Lean Leadership. The results of path coefficients obtained show Lean Management Practices has strong significant relationship with Lean Leadership with $\beta = 0.330$ at t-value = 2.818 ($p < 0.05$). Therefore, H3 is supported.

Hypothesis 4 (H4) posited that there is a positive relationship between Gemba Practices and Lean Leadership. The results of path coefficients obtained show Gemba Practices has strong significant relationship with Lean Leadership with $\beta = 0.295$ at t-value = 2.715 ($p < 0.05$). Therefore, H4 is supported.

Hypothesis 5 (H5) posited that there is a positive relationship between Lean Leadership and Sustainability Performance. The results of path coefficients obtained show Lean Leadership has strong significant relationship with the Sustainability Performance with $\beta = 0.202$ at t-value = 2.193 ($p < 0.05$). Therefore, H5 is supported.

Hypothesis 6 (H6) states that Lean Leadership mediate the relationship between Lean Management Practices and Sustainability Performance. This is followed by the indirect effect between Lean Management Practices and Sustainability Performance mediated by Lean Leadership, which is significant with $\beta = 0.067$ at t-value = 1.819 ($p < 0.05$). Therefore, H6 is supported.

The last hypotheses (H7) states that Lean Leadership mediate the relationship between Gemba Practices and Sustainability Performance. This is followed by the indirect effect between Gemba Practices and Sustainability Performance mediated by Lean Leadership, which is not significant with $\beta = 0.060$ at t-value = 1.544 ($p > 0.05$). Therefore, H7 is not supported.

REFERENCE LIST

- Aij, K. H., & Teunissen, M. (2017). Lean leadership attributes: a systematic review of the literature. *Journal of Health, Organisation and Management*, 31(7–8), 713–729. <https://doi.org/10.1108/JHOM-12-2016-0245>
- Albliwi, S., Antony, J., Lim, S. A. H., & van der Wiele, T. (2014). Critical failure factors of lean six sigma: a systematic literature review. *International Journal of Quality & Reliability Management*.
- Alefari, M., Salonitis, K., & Xu, Y. (2017). The role of leadership in implementing lean manufacturing. *Procedia Cirp*, 63, 756-761.
- Chiarini, A. (2014). Sustainable manufacturing-greening processes using specific lean production tools: an empirical observation from European motorcycle component manufacturers. *Journal of Cleaner Production*, 85, 226–233.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, 295(2), 295-336.
- Chin, W. W. (2010). How to write up and report PLS analyses. In *Handbook of partial least squares* (pp. 655-690): Springer.
- Cohen, J. (1988a). Statistical power analysis for the behavioral sciences 2nd edn. In: Erlbaum Associates, Hillsdale.
- Cohen, J. (1988b). Statistical Power Analysis for the Behavioral Sciences. 2nd edn. Hillsdale, New Jersey: L. In (2nd edn ed.). New Jersey: Lawrence Erlbaum Associates.
- Dombrowski, U. Mielke, T. (2013). Lean leadership – fundamental principles and their application. In *Procedia CIRP: 46th CIRP Conference on Manufacturing Systems*,
- Karimimalayer, M., Alavifar, A., & Anuar, M. (2012). Structural equation modeling VS multiple regression the first and second generation of multivariate techniques. *Eng Sci Technol An Int J*, 2, 2250-3498.

- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (IJeC)*, 11(4), 1-10.
- Fok-Yew, O. (2018). The mediating effect of lean's soft factors on lean's hard factors and operational excellence in Malaysia manufacturing companies. *International Journal of Business Marketing & Management (IJBMM)*, 3(1).
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 39-50.
- Franke, G., & Sarstedt, M. (2018). Heuristics Versus Statistics in Discriminant Validity Testing: A Comparison of Four Procedures. *Internet Research*, forthcoming.
- Grewan, S. (2019). Lean leadership behaviours required for employee engagement. Retrieved from <https://core.ac.uk/download/pdf/270044585.pdf>
- Hair, Joseph F., Hult, G., Tomas, M., Ringle, Christian M., & Sarstedt, M. (2013). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
- Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2013). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2 ed.): Sage Publications.
- Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107-123
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing science*, 43(1), 115-135.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing (AIM)*, 20, 277-320.
- Imai, M. (1986). *Kaizen* (Vol. 201). Random House Business Division New York.
- Jadhav, J. R., Mantha, S. S., & Rane, S. B. (2014). Exploring barriers in lean implementation.
- Peat, J., & Barton, B. (2008). *Medical statistics: A guide to data analysis and critical appraisal*: John Wiley & Sons.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of applied psychology*, 88(5), 879-903.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods*, 40(3), 879-891.
- Pokinska, B., Swartling, D., & Drotz, E. (2013). The daily work of lean leaders—lessons from manufacturing and healthcare. *Total Quality Management & Business Excellence*, 24(7-8), 886–898.
- Ringle, C. M., Sarstedt, M., & Straub, D. (2012). A critical look at the use of PLS-SEM in MIS Quarterly.
- Sarstedt, M., Hair Jr, J. F., Cheah, J.-H., Becker, J.-M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal (AMJ)*, 27(3), 197-211.
- Setubal, Portugal. Gertrude, M. (2018). Lean Management Practices and Operational Performance of Commercial Banks in Kenya By Gertrude Manga Mwachari a Research Project Submitted in Partial Fulfillment for the Award of Master of Business Administration (Mba) School of Business , University of.
- Sloan, T., Fitzgerald, A., Hayes, K. J., Radnor, Z., Robinson, S., Sohal, A., (2014a). Readiness factors for lean implementation in healthcare settings—a literature review. *Journal of health organization and management*.
- Ssesagawa, G. (2014). Factors Influencing Employee Job Satisfaction And Its Impact On Employee Performance: A Case Of Unilever Kenya. United States International University.

- Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics & Data Analysis*, 48(1), 159-205. doi:<https://doi.org/10.1016/j.csda.2004.03.005>
- Van Dun, D. H., & Wilderom, C. P. (2016). Lean-team effectiveness through leader values and members' informing. *International Journal of Operations & Production Management*.
- Wong, K. K.-K. (2013). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. *Marketing Bulletin*, 24(1), 1-32.
- Zhu, Q., Johnson, S., & Sarkis, J. (2018). Lean six sigma and environmental sustainability: a hospital perspective. *In Supply chain forum: An international journal* (Vol. 19, pp. 25–41).