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Ethical Challenges of Lean Implementation in Nigerian Manufacturing Industry: An Exploratory Study

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Abstract

Organisations seek competitive advantage over rivals, and one of the ways to achieve and consolidate on this objective is through cost minimisation, waste reduction, time study and improved productivity which are the benefits of lean manufacturing implementation. However, several factors impede the effective implementation of lean, the ethical issues that hinder successful lean implementation in organisations are prevalent. To this end, there is a need to consider the ethical issues that may hinder the successful implementation of the lean programme. This cross-sectional study attempts to find these ethical issues using the Nigerian manufacturing industry. Using a quantitative method, data were collected from employees and managers of the sampled organisations. Results revealed that top management commitment, ethical instructions and directives, and leadership approach are the ethical issues of lean implementation in Nigeria. It is recommended that organisations should give proper ethical instructions and directives to employees to ensure that lean manufacturing implementation is successful.

Keywords: ethics, ethical issues, lean manufacturing, lean implementation, Nigeria.

Introduction

The evolution in the global economy has led organisations to be grappling with dynamic situations. Increasing demands from customers, fierce competition, and the mandatory need for organisations to innovate and invent ideas have made many manufacturing organisations to explore ways to create more wealth and value without an increase in the cost of products and services. To achieve this, most organisations have employed all effective means of minimising product manufacturing costs, overcome manufacturing hindrances, and reduce production wastes and losses to boost productivity level (Hama-Kareem, Al Askari & Muhammad, 2017; Nachlappan & Anantharaman, 2006; Habib, Wang & Bejhem, 2008). One of the strategies employed to do this is lean manufacturing (Bayat & Dadashzadeh, 2017).

In recent times, the usage of lean has been ubiquitous. Lean, conceptualised as an integrated set of practices, principles, and techniques which aim at advancing quality, delivery, and customer satisfaction through deliberate reduction or elimination of loss, waste and rigidity (Drew, McCallum & Roggenhofer, 2016), evolves from production system as implemented by Toyota in Japan. It has transcended production and entered the digital, entrepreneurship, finance, and other space.

The striking influence of lean management in both academic and practice circle is prevalent (Hines et al., 2004). Most organisations have embraced lean approach due to its unrepentant and profound influence on the reorganising of the global industry (Abdul Raman & Jamaludin, 2008). Despite the ubiquity of usage and that the underlying understanding of the concept remains unchanged – "*doing more with less*," effective implementation of the concept in many organisations remains a significant challenge with attending consequences (Alefari, Salonitis & Xu, 2017; Stone, 2012).

Although some researchers have put much emphasis on the urgent need to motivate organisations towards the implementation of the lean system (Abrahamsson & Isaksson, 2012; Al-Najeem, 2014), others (Hoyte & Greenwood, 2007; Hama Kareem et al., 2017) argued that the difficulty in the implementation of lean strategies is prevalent. The likelihood that lean implementation would fail is high. Buttressing this, Balle (2005), Emilliani (2008), Papadopoulou and Ozbayrak (2005) posited that irrespective of the enormous advantages of a lean system, failure in its implementation is pervasive. Antecedents of the lean implementation failure have brought a high level of divergence among scholars. Several researchers (Bayat & Dadashzadeh, 2017; Hamas Kareem et al., 2017; Laureani & Anthony, 2012; Worley & Doolen, 2014) posited that several issues have an essential effect on the implementation of lean manufacturing. For instance, extant literature has identified the factors impacting effective lean implementation to include: organisational culture, organisational ownership, leadership capability and commitment, and organisational readiness, resource availability, external support, communication and engagement, teamwork, and timing (Alefari, Salonitis & Xu, 2017; Salonitis & Tsinopoulos, 2016). However, in this study, it is argued that besides the above-listed, there are some ethical issues and challenges faced in the effective implementation of lean in the manufacturing industry with special focus on the manufacturing companies in Nigeria.

Albeit, several scholars and researchers, have viewed lean system implementation from different viewpoints, investigations into the ethical challenges faced in the implementation of lean manufacturing are scarce, especially in developing countries such as Nigeria. Although, Abioye and Bello (2012), Alawode and Ojo (2008), Olatunji (2008), Odeyinka, Oluwaseyi and Akinyele (2018) have all studied lean implementation in Nigeria, in our extensive search of extant literature, no investigation, either empirical or theoretical, has been found to have deep thought and thorough study on the ethical challenges affecting lean manufacturing implementation in Nigeria.

Different contexts and firms have peculiar causal factors responsible for the failure of lean implementation (Al-Najeem, 2014; Vermaak, 2010), which may result from varying industrial traditions (Womack & Jones, 2003). Herron and Braiden (2007) argued that the failure of lean implementation is also a function of the cultural differences brought about by the implementation transition. The Nigerian context provides a typical illustration of an emerging economy which many has singled out as a major factor in the increasing drive for sustainable growth and development in Africa considering its economic size and high Gross Domestic Product (GDP) (Chinelo, Munirat & Ronald (2013; Evans, 2013; Umude-Igbru & Price, 2015). In Nigeria, the leading sector driving lean implementation is the manufacturing and production industry (Umude-Igbru & Price, 2015). This sector contributes more than 60% to the Nigerian GDP (Chete et al., 2014; Euromonitor, 2014) and with the presence of multinational and transnational firms in the sector; it has brought about the increased need for firms in the country to look for best practices to gain competitive advantage. In a study conducted by Umude-Igbru and Price (2005) on the patronage of the lean system with consulting companies among firms in Nigeria, the study revealed that consulting companies stated that manufacturing industries, majorly multinationals, patronise their lean system products more. This trend depicts how pervasive lean implementation is in the Nigerian manufacturing industry. Also, it was found that low awareness level or inadequate knowledge, Nigerian environment and culture, leadership culture, management buy-in, lack of quality-driven culture, and employee commitment are the challenges faced in the implementation of lean manufacturing in Nigeria.

Extending the findings of Umude-Igbru and Price, the primary concern of this study is to empirically investigate whether all Nigerian manufacturing industries, besides multinationals, are sufficiently interested and have imbibed full lean implementation. Subsequently, the study will focus on the motive behind lean manufacturing implementation, and whether there are other challenges in the implementation of lean manufacturing in Nigeria besides those found by Umude-Igbru and Price. Also, the particular emphasis would be accorded the ethical challenges as it relates to employees and the leadership of the firm implementing lean manufacturing.

The contribution of this study will be in three-fold. First, this study will dig out the ethical challenges faced in the implementation of lean manufacturing in Nigeria. Secondly, a particular emphasis that would be placed on the ethical issues as it relates to employees and management of the lean implementing firm would allow quality recommendations that will assist organisations in surmounting the employee and leadership concerns in the implementation of lean manufacturing. Lastly, this study will expand the frontiers of knowledge in lean manufacturing in the Nigerian and African context and allow decision-makers to understand further issues that need to be addressed in the lean manufacturing implementation in emerging economies.

Literature review and propositions

Lean manufacturing

The lean ideology, as defined above, emerged from the automobile manufacturing management processes. Early 20th century, Henry Ford conceptualised a model, "Fordism," imbibed in work processes to boost production and manufacturing capacities to eliminate waste, improve efficiency, customer value and employee competencies (Staats & Upton, 2011). Fordism gave Ford Motors the leverage of decreased work hours and resources in assembling cars. This impacted the work quality substantially, but defect rates remain high (Hobbs, 2004). Later in the 1950s, Toyota, building on the Fordism process, identified mass production, even when not needed, as a major setback of the Ford Motors lean-approach. They modified Fordism and build processes, labelled Just-in-Time, which enabled them to manufacture automobile parts in smaller and needed amounts (Mohammed, 2016). Unlike Fordism, Toyota's JIT places much emphasis on producing needed products quantity while still minimising cost. Following the success of the JIT and in due course, Toyota's ideology became widely known as the "Toyota Production System" (TPS) (Liker, 2004). Although both Fordism and TPS provided the foundation for lean manufacturing, the concept 'lean' was first used in 1988 by Karafjick in the article titled – "*Triumph of the Lean Production System.*" Ever since its first use, the concept has been a household name in the parlance of effective and efficient production and service processes.

Guiding the practical usage of lean are certain principles which are fully embedded in the principles of *continuous improvement* and *respect for people* (Liker, 2004; Womack et al., 2007). Womack and Jones (2003) and Liker (2004) identified five and fourteen (14) principles of lean, respectively. Both principles provided guidelines to be followed in the implementation of lean; however, lean should be seen not only as a philosophy but also a continuous journey to improvement (Mwacharo, 2013; Radnor & Walley, 2008; Womack & Jones, 2003). Organisations can develop into lean firms over time when following the principles as identified above. To achieve this, most firms employ tools and techniques such as 5S, JIT, Kaizen, Kanban, Improvement Cycles, Six Sigma, and other improvement tools.

Ethical issues in lean implementation

Increased incidents and publication of organisational scandals and the Sarbanes Oxley Act have brought about high-level concern for organisational ethics (Ljungblom, 2014; Phillipson, 2004). Ethics, as a philosophical concept, is about values and morals that are right or wrong. As different individuals have values and moral philosophies that see actions as ethically right or wrong, organisations and professions also have values and moral philosophies for justifying an action as right or wrong. Most organisations have an ethical code of conduct that guides actions and thought of managers and employees. Even where an ethical code is absent, organisational members are expected to behave according to the norm and values of the industry in which the firm operates. Similarly, in the implementation of lean methodology, there are ethical standards expected of organisational members, especially the management and leadership. The role of ethics in lean implementation cannot be overemphasised as it is needed for success (Gonzalez & Guillen, 2002). Hassan, Mohd Asaad, and Iteng (2017) argued that lean and ethics need to be harmonised to achieve a better organisational result. According to this school of thought, in the implementation of lean, employees who are conscious of an ethical code in their dealing with customers and work colleagues are a recipe for successful lean implementation. Also, lean values and principles need to be compared with organisation and industry ethical codes to identify possible interrelationship and asymmetry (Ljungblom, 2014). Based on the above, it proposed that:

H1: Organisation's ethical code affects the implementation of lean manufacturing.

Recent studies (Hama Kareem & Abu Talib, 2015; Hama Kareem et al., 2017) have indicated that some ethical factors make an impact on lean implementation. Arguing from the employees' perspective, they posited that shift in the thinking, psychology, and philosophy of employees towards lean is a comprehensive recipe needed for lean manufacturing implementation success. They further stated that ethical factors such as ethical training programs and ethical instructions and command affect employees' thought about organisational relationships, strategies, and policies.

Transparent and truthful communication in the form of training across the organisation can assist in the successful implementation of organisational policies and strategies (Panneerselvam, 2012). Such training programmes need to be ethically driven to prepare organisational members morally before policy execution. Poor communication and awareness, and lack of ethical training programme have led to adverse consequences for organisational policies (Hayes & Pisano, 1994). In the implementation of lean tools and techniques, past researchers (Westphal et al., 1997; Mckone et al., 2001; Hama Kareem & Abu Talib, 2015; Hama Kareem et al., 2017) have found that when employees resist lean due to inadequate training, and poor ethical communication and education. Ethical training enables employees to understand and grasp the ethical need for lean techniques fully and imbibe them for successful implementation.

Similarly, Giving out instructions and commands not fully grasped by employees about a process can lead to an unethical response from workers (Kumar et al., 2014). Counter-productive work behaviours, immoral actions are consequences of undue pressure, stress, and unethical instructions and commands from supervisors (Gibson, 2007; Trevino & Nelson, 2010). Hence, the following hypothesis:

H2: *Ethical instructions and directives will strongly impact the successful implementation of lean manufacturing programmes.*

Past studies have juxtaposed the importance of management commitment and leadership style, and non-human resistance as critical success factors in the implementation of lean (Achanga et al., 2006; Langstrand & Elg, 2012; Lodgaard et al., 2016; Netland, 2015; Worley & Doolen, 2006). Lack of management commitment and the absence of strong leadership are factors that can impede the success of lean implementation. Also identified are poor communication and employee opposition (Lodgaard et al., 2016). Lean implementation requires a high level of organisational change, and management must effectively manage the change process and put in the more managerial effort to surmount all form of resisting forces for successful lean implementation. Supportiveness and imbibing lean philosophy into employees are the expected roles of managers in lean implementation. However, disrespect and neglect or discharge of people are prevalent in lean implementation which has created one of the profound hindrances to effective lean implementation (Bhasin & Burcher, 2006; Liker & Hoseus, 2010; Wyrwicka & Mrugalska, 2017).

Scholars, having identified the barriers to effective lean manufacturing implementation, argued that some ethical issues are connected to the barriers, especially as it relates to management and employees. For instance, in the implementation of lean management, teamwork building, collaboration, and open communication are some of the human relation parameters needed for success (Ljungblom, 2014; Poksinska, 2010). However, studies have shown that managers in the implementation of lean practices do not perform these roles ethically (Poksinska et al., 2013). In a lean implementation, organisational leaders and managers are meant to motivate, coach and develop individuals and teams for successful lean implementation (Anhede & Lord, 2009; Poksinska et al., 2013); however, situations prevalent are where employees are not fully aware, trained and motivated to embrace lean (Ljungblom, 2014), lean thinking and philosophy not imbibed in every organisational member. In a survey conducted on Canadian manufacturing firms in 2007, it was found that lack of implementation knowledge and employees consciously or unconsciously returning to old ways is one of the most significant impediments to lean implementation (Bicheno & Holweg, 2009). Based on this, it is proposed that:

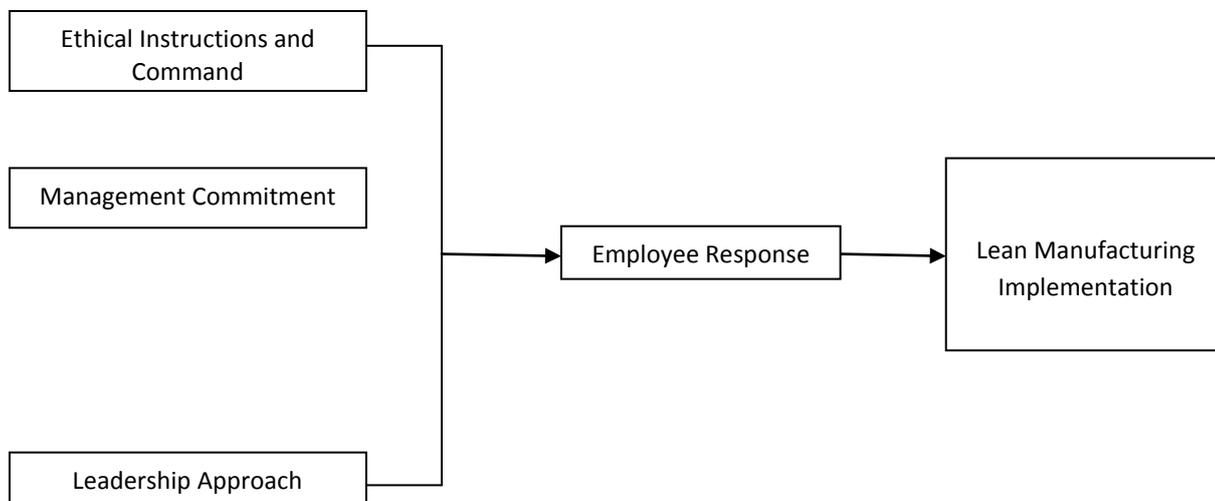
H4: *Leadership approach strongly affects lean manufacturing implementation.*

H5: *management commitment strongly affects lean manufacturing implementation.*

H6: *Leadership approach strongly affects how employees respond to lean manufacturing implementation.*

Conceptual framework: Figure 1

Figure 1. Conceptual Framework.



Method

Sample and procedure

The respondents surveyed for this study are the employees in the production department of manufacturing companies in Nigeria. A total of 207 respondents drawn across manufacturing companies in Lagos and Ogun states in Nigeria were surveyed. The respondents are not limited to factory employees but also managers and production assistants in those factories who are well aware of the lean manufacturing implementation processes. The respondents were surveyed using a structured questionnaire adapted/adopted from validated scales from previous literature. The questionnaire has a note that specified the ethical considerations for the respondents before participation in the study.

Measures

For this study, the variables of "management commitment", "ethical instruction and directives", "lean leadership approach" and "lean manufacturing implementation" are measured with validated scales from literature. We adapted the Management Commitment (MC) 2-item scale from Malmbrandt and Ahlstrom (2013). We reduced the 5-item scale to 2-item due to compatibility with our study context and purpose. The scale has a 5-point score of 1-5 representing strongly disagree, disagree, neutral, agree, and strongly agree respectively. Ethical Instruction and Directives (EID) was measured with an adaptation of a scale developed and validated by Brown, Trevino and Harrison (2005). From the original version of the scale, only three items were adopted. The items were rated on a five-point scale of strongly agree to disagree strongly. Previous researchers have widely used this scale due to its reliability and validity.

Lean Leadership Approach was measured using a scale adapted from Bass and Avolio (2004) MLQ 5X short form leadership scale. The items are rated on a five-point scale of 'frequently, if not always', 'fairly often', 'sometimes', 'once in a while', and 'not at all'. The Lean Manufacturing Implementation (LMI) was measured with an adapted scale from Shah and Ward (2007). The scale has 21 items which address how lean manufacturing is implemented in the various organisations of the respondents. The items are rated on a five-point scale of 'complete implementation', 'extensive implementation', 'some implementation', 'and little implementation', and 'no implementation'.

Results

The demographic attributes of the respondents are presented in table 1 below. Male respondents are 72.5% of the sampled employees. In terms of education, more respondents have bachelors and masters degree coupled with adequate experiences in factory and production processes.

40.6% of the respondents had 1-5 years of manufacturing experience, 39.1% are with 6-10 years of experience in the manufacturing industry, 14.5% had 11-15 years of manufacturing experience, while 5.8% of the sample is with above 15 years of experience in the manufacturing sector.

Reliability Analysis

The Cronbach's alpha was used to test the consistencies of the items used for each of the scales. LMI with five items has a reliability coefficient of 0.78; LLA with 2 items has a reliability coefficient of 0.71; MC with 2-items has an alpha reliability coefficient of 0.63, and EID with 2 items has an alpha reliability coefficient of 0.66. Although the recommended alpha reliability coefficient for management and social science research is 0.70 minimum as given by Nunally (1978), reliability coefficient between 0.6 and 0.7 is still acceptable as argued by some research method scholars (e.g. Di Iorio, 2005; Hair, Anderson, Tatham & Black, 2006; Hinton, Brownlow, McMurray & Cozens, 2004; Nunally & Bernstein, 1994).

Validation of the Factor Structure

The variables considered are Management Commitment (MC), Ethical Instructions and Directives (EID), Lean Leadership Approach (LLA) and Lean Manufacturing Implementation (LMI). MC has 2 questions, EID – 3 questions, LLA – 4 questions, and LMI – 21 questions. However, after doing the rotated factor analysis, it was discovered that some factors loaded higher on other variables and was removed. For MC, only MC2 loaded separately from other variables. EID1 and EID3 also loaded significantly from the variables and were retained. Similarly, LLA1, LLA3, LMI10, LMI11, LMI13, LMI15 and LMI19 were also retained due to proper loadings.

Regression and Correlation Analysis

Tables 3 and 4 displayed below to show the regression and Pearson correlation analysis for the variables. It showed the relationship and its degree between the dependent variable LMI and independent variables MC, EID and LLA. From the tables below, there are significant positive relationships between LMI and MC, EID and LLA with correlation coefficients of 0.343, 0.446 and 0.621, respectively. The regression coefficient of 0.647 with adjusted R square of 0.41 was recorded and highly significant. The positive relationship found between MC and LMI (standardised coefficients = 0.34; p<0.01) provide adequate statistical evidence to accept the proposition that management commitment to lean manufacturing impact the implementation of lean programs. Although the relationship is not strong enough, it indicates that in situations where management commitment to lean manufacturing is high, the implementation will be likely hitch-free and successful, and vice versa.

Similarly, the proposition that ethical instructions and directives from managers to employees will impact lean manufacturing implementation was supported. The result showed a positive linkage between ethical instructions and directives, and lean manufacturing implementation (standardised coefficient = 0.45; p<0.01). This finding implies that the more employees grasp the instructions and directives from managers with regards to lean manufacturing, the likelihood that the implementation program will be successful and vice versa. Lastly, the results also indicated a positive direct relationship between lean leadership approach and lean manufacturing implementation (standardised coefficient = 0.65; p<0.01). The results support the proposition that the lean leadership approach strongly affects how employees respond to lean manufacturing implementation. The result shows that a more acceptable leadership approach will yield successful lean manufacturing implementation.

Table 1. Demographic attributes

Variables	(2) Frequency	(3) Valid Percent (%)
Gender		
Male	(18) 150	(29) 72.5
Female	(19) 57	(30) 27.5
Education		
High School	(20) 3	(31) 1.4
Diploma	(21) 46	(32) 22.2

Undergraduate	(22) 103	(33) 49.8
Graduate	(23) 54	(34) 26.1
Others	(24) 1	(35) 0.5
Work Years		
1-5	(25) 84	(36) 40.6
6-10	(26) 81	(37) 39.1
11-15	(27) 30	(38) 14.5
Above 15	(28) 12	(39) 5.8

N = 207

Table 2. Rotated component matrix

	Component			
	1	2	3	4
LMI11	.720			
LMI15	.712			
LMI10	.708			
LMI13	.701			
LMI19	.635			
LLA1		.867		
LLA3		.741		
EID3			.862	
EID1			.803	
MC2				.922

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 3. Regression model summary

Model	R	R Square	Adjusted R Square	Std. An error of the Estimate
1	.647 ^a	.419	.410	.62179

a. Predictors: (Constant), LLA, MC, EID

b. Dependent Variable: LMI

Table 4. Correlations

		MC	EID	LLA	LMI
MC	Pearson Correlation	1	.455**	.335**	.343**
	Sig. (2-tailed)		.000	.000	.000
	N	207	207	207	207
EID	Pearson Correlation	.455**	1	.498**	.446**
	Sig. (2-tailed)	.000		.000	.000
	N	207	207	207	207
LLA	Pearson Correlation	.335**	.498**	1	.621**
	Sig. (2-tailed)	.000	.000		.000
	N	207	207	207	207
LMI	Pearson Correlation	.343**	.446**	.621**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	207	207	207	207

Model	R	R Square	Adjusted R Square	Std. An error of the Estimate
1	.647 ^a	.419	.410	.62179

** . Correlation is significant at the 0.01 level (2-tailed).

Discussion

This study aimed to explore the ethical challenges of lean implementation in the Nigerian manufacturing sector towards providing a suitable framework for the relationship that exists between organisational employees and management. Also, this study aimed at expanding the frontiers of knowledge in lean manufacturing in the Nigerian and African context; and to provide policy and decision-makers with the opportunity to understand further issues that need to be addressed in the lean manufacturing implementation in emerging economies. Our study results show that management commitment has a positive and direct effect on the lean implementation in manufacturing companies in Nigeria. The finding is consistent with the previous studies in other contexts. Confirming this relationship, this study indicates that there must be management commitment if lean manufacturing is to be effectively implemented in an organisation. Ethical instructions and directives (EID) were also found to be a good predictor of lean manufacturing implementation. Hama Kareem et al. (2017) and Kumar et al. (2014) also found ethical instructions and directives to have a direct and robust impact on lean implementation in different contexts.

For lean leadership approach and its relationship with lean manufacturing implementation, our finding is consistent with previous findings. This study confirms empirically that the leadership style is an important factor in the implementation of lean manufacturing.

Theoretical and Practical Implication

Theoretically, this study expands our knowledge of lean manufacturing implementation in the emerging economy context. The study offers further explication on the antecedents of effective and efficient lean manufacturing implementation. Building on previous studies, this study was able to extend the findings of successful lean implementation. Also, it further deepens our understanding as to how to successfully implement lean manufacturing considering management commitment, ethical instructions and leadership styles. From the practical perspectives, findings from the study will provide managers with important considerations for successful lean implementation. Also, production and operations managers who are charged with the implementation of lean must ensure that they are highly committed to the process, give the right directives and commands to employees with regards to lean implementation while also using the right leadership approach.

Limitations and proposal for future studies

Although the study presents some relevant results, it is pertinent to point out the limitations. The study is contextualised explicitly in the Nigerian manufacturing industry. Hence, the generalisation of the findings of the study should be cautiously made. A larger sample employed by future studies can reveal further hidden facts and make generalisation more appropriate. The cross-sectional nature of this study is a limitation. Future research could, therefore, reveal the long-term effect of the identified antecedents on lean manufacturing implementation. Although there are pieces of evidence from the literature to support the findings from this study, a limiting factor is noticed in the insignificance of the correlation results. Future studies can show better significance in the correlation results.

Conclusion

This study shows evidence of the ethical issues in lean manufacturing implementation in Nigeria. In particular, it was found that specific ethical problems must be present and adequately addressed if lean manufacturing implementation is to be successful in organisations. Firms adopt lean manufacturing to reduce cost and enhance the effectiveness and efficiency of products and services. Such firms always face the issue of how best to implement such programmes considering the ethical challenges such implementations poses.

Findings suggest that managers in Nigerian manufacturing organisations, within the framework of emerging economies, should take ethics seriously in the implementation of lean programmes. Senior management should show commitment to the ethics of lean manufacturing implementation and provide ethically inclined instructions, processes, and directives. Findings further depict that the leadership style adopted by the top management is a major ethical concern in lean implementation. If the management style is highly anti lean processes, the firms cannot successfully implement lean, and that can lead to grave consequences for the firm in terms of production cost and processes, and product quality.

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