

Lean Management and Organizational Performance in Selected Manufacturing Firms in Akwa Ibom State

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ABSTRACT: *The study centered on Lean management and Organizational performance in selected manufacturing firms in Akwa Ibom State. Two research questions as well as two hypotheses were formulated for the study. The researcher adopted survey research design. The population covers 59 top management level, middle management level and lower management level staff in selected manufacturing firms in Akwa Ibom state. Census Techniques was used to collect data for the entire population. Using Ordinal Logistic Regression Tool Analysis, the two hypotheses were tested at 0.05 level of significance and the results of the analysis showed that Lean Management dimension (Value stream mapping is 3.246, PV = 0.002., and waste elimination is 3.024, PV = 0.003,) has a significance relationship on Organizational Performance in manufacturing firms in Akwa Ibom State. From the study conducted, it was concluded that value stream mapping, waste elimination, are relational dimensions that can influence organizational performance in selected manufacturing firms in Akwa Ibom State. It was recommended that, management of the studied organization should strengthen their policies that will support manufacturing and operations by identifying the value from the customer's perspective, map out the value stream, which is the end-to-end flow of activities required to deliver the product or service analyze the value stream to identify and eliminate waste, such as overproduction, waiting time, unnecessary motion, defects, and excess inventory. It is also recommended that the manufacturing firms should incorporate waste eliminating in its operations process such as value stream mapping, total product maintenance and continues improvement in order to increase overall cost efficiency.*

KEYWORDS: Lean management, Organizational performance, Value stream mapping, waste elimination.

INTRODUCTION

Nowadays companies all over the world are facing increasing pressure from customers and competitors. Customers have higher expectations, and manufacturers can meet these expectations by increasing product's quality, reducing delivery time, and minimizing costs or a combination of these three ranges (Ekanem, Akpan, Ekanem, and Edem, 2023). This forces businesses to implement new production strategies to enhance their competitiveness in the global market place (Chena, 2016). Lean is an integrated set of ideas, procedures, instruments, and methods that presupposes the use of all resources for any reason other than generating value for the final user. Organizations become more competitive, flexible, and responsive to customers when non-value-added tasks are eliminated since they cut costs and cycle times (Alukal, 2023). Lean management is essential to the success of firms because of its ability to promote shared leadership and accountability as well as its dedication to promoting continuous development, which guarantees that every individual contributes to the advancement process. This management approach acts as a guide for building a strong and productive business that consistently advances, identifies and fixes actual issues, and, most importantly, maintains competitiveness (Uwa 2022).

Many academics and researchers have looked at the relationship between lean management methods and an organization's overall performance. The concept of lean management has also given rise to a number of different arguments. The concept of continuous improvement, which is a long-term approach to work that methodically seeks to achieve small, incremental changes in processes in order to improve efficiency and quality, is supported by lean management, an organizational management style (Ekanem, Iko, Ekanem, and Ajibade, 2023). Lean management identifies every step in a company process and then rewrites or removes processes that do not add value in an effort to reduce any waste of time, money, or effort.

A managerial strategy known as "lean management" aims to eliminate inefficiencies within a company in order to boost performance overall and respond more quickly to client demands. Although Taiichi Ohno is regarded as the father of lean manufacturing since he implemented the concept at Toyota Automotive initially, Henry Ford is regarded as a significant figure in manufacturing because he integrated production steps into his own entire process (Srivastava, 2016). Ohno therefore thought that cutting waste would give them a competitive advantage through improved quality and time savings (Srivastava, 2016). Ohno's philosophy has persisted to this day, despite the sophistication of today's approaches. Organizations who apply Lean Management are still concentrating key processes to customer value by making them as efficient as possible (Lean Enterprise Institute, 2021).

Lean is a methodical strategy to improve an organization's performance by removing all forms of waste from the production process. Focusing on continuous process improvement, lean is the

quality program that offers the most successful business improvement approaches. These methods are used to enhance company procedures, get rid of flaws, shorten cycle times, expedite delivery at a low cost, and quicken the process of finding and fixing problems in order to guarantee excellence in business and operational management (Antony, 2019). There are a number of important factors or components related to lean management. Value stream mapping and waste removal are two of the many variables that were considered in this investigation. A visual tool called value stream mapping is used to examine and record the movement of data and materials inside a process or value stream. It assists in locating inefficiencies, bottlenecks, and places that could use improvement. Elimination of waste: Recognizing and getting rid of garbage, or "muda." There are many different ways that waste can occur, including extra production, waiting, excess inventory, needless travel, flaws, overprocessing, and underutilization of talent. It is noteworthy that the particular metrics employed may differ based on the industry, organization, and goals of the lean management programs. The metrics chosen should support the objectives of the company and offer insightful data on how well lean techniques are working. Thus, this study examine the effect of lean management on organizational performance in selected manufacturing firms in Akwa Ibom State.

Statement of the Problem

Organizations are faced with many problems daily and the problems usually manifest in the form of poor-quality products, wastage during production, excess work in progress along the value chain, prolonged residence time to finish a product for shipment to the customer, and sunk costs incurred along the value chain. All these problems when compounded point to poor delivery service and unsatisfied customer along the value chain. This brings in an argument to showcase the impact of the lean management approach and demonstrate how effective the concept is and the applicable tools utilized to improve performance. Arguments are backed by the introduction of the much-neglected elements as these tools and concepts are utilized to propel performance, the element of the human factor, which is regarded as a "soft issue" in the research spectrum. The approach presented by the author is a radical one but commensurate with the concept of lean management as it exhibits the improvement of organizational performance. Although lean management has been studied in details, insufficient attention has been paid to demonstrating the ability with which tool is able to link with other tools or concepts to provide better performance (Nash and Poly, 2008). This study will examine the effect of lean management on organizational performance in selected manufacturing firms in Akwa Ibom State.

Objective of the Study

The main objective of this study was to ascertain the relationship between lean management and organizational Performance in selected manufacturing firms in Akwa Ibom State. The specific objective includes;

- i. to examine the relationship between value stream mapping and organizational performance in in selected manufacturing firms in Akwa Ibom State.
- ii. to ascertain the relationship between waste elimination and organizational performance in in selected manufacturing firms in Akwa Ibom State

Research Question

- i. what is the relationship between value stream mapping and organizational performance in in selected manufacturing firms in Akwa Ibom State?
- ii. what is the relationship between waste elimination and organizational performance in in selected manufacturing firms in Akwa Ibom State?

Statement of Hypothesis

Ho₁: There is no significant relationship between value stream mapping and organizational performance in in selected manufacturing firms in Akwa Ibom State

Ho₂: There is no significant relationship between waste elimination and organizational performance in in selected manufacturing firms in Akwa Ibom State

LITERATURE REVIEW

Concept of Lean Management

McLaughlin (2016) defines lean management as an organizational management strategy that upholds the idea of continuous improvement, which is a long-term approach that methodically accomplishes tiny, incremental changes in the process to increase quality and efficiency. Lean management is a management system designed to increase production by reducing waste, according to Collar and Bradford (2022). Based on the two definitions, it is evident that lean management pertains to ongoing enhancements intended to boost production and efficiency by eliminating waste. Organizations have attempted to improve better results through incentives, but implementing a lean culture has led to even better outcomes because it empowers and respects employees and gives them ownership over the tasks they perform. Lean management is a cultural issue. Lean Management prioritizes maintaining good public relations, professional training, and staff attitude shaping (Lichtarski 2014). This approach gives the areas of the company's human resources management critical consideration. This document provides a quick definition of a few key components that all managers should consider. These are:

Good work environment: It is the employer's responsibility to create a positive work environment. In addition to assisting staff in completing their daily responsibilities, a happy work environment strengthens relationships between coworkers and the business. Because of

this, the workers are driven to the point of professional dedication, even if it means putting in extra time to finish a task that has been assigned to them.

Establishing the goals: An individual must be aware of the work's objectives in order to perform their job well. Establishing both short-term and long-term goals for the staff is therefore crucial. While the latter would concentrate on paying attention to the daily duties they undertake, the former would be more concerned with the progress of their professional career.

Communication: it is one of the most principal elements that is frequently omitted in human resources management. Basically, managers of all levels should construct a system of information exchange among the employees of a particular department. It is worthwhile to organize daily brief meetings for employees to elevate the quality of communication. At the meeting, the employees could exchange information, check the status of tasks or solve problems on a regular basis.

Proper motivation: One management style known as "lean management" suggests that managers abandon traditional means of motivating staff members, such as bonus systems and the "carrot-and-stick" strategy, which only produces short-term results. Instead, managers should look for internal motivators for each employee..

Wasting human potential: A lot of businesses strive to continuously improve their operations. Various approaches are used to reach this condition. Sometimes, outside businesses are brought in to help the target company operate better. Managers occasionally enforce rules without first consulting their staff. Proceedings of this kind are considered trash (Liker and Meier 2008). In contemporary organizations, it is advised to regularly discuss changes with staff members who are directly involved in the issue they are handling.

Development of employees: Employees who support production as well as indirect labor are among the most important resources in most businesses. Managers should therefore take all reasonable steps to give staff members the chance to grow personally. The idea that investing in human resources is equivalent to investing in the organization and that the results would eventually prove advantageous is often minimized or overlooked (Uwa, 2021). A few specific techniques help achieve the goal of having highly qualified management. The competence matrix and development projects are the most well-known.

Leadership: Managers should be aware of the significance of the management style they use with their staff members at all times (Uwa, 2021). It is totally inappropriate for managers to take credit for their staff members' actions or to fail to use materials that their subordinates were forced to generate. When crisis situations arise, it is also crucial for managers to look for solutions rather than victims. In order to become Lean Leaders and subsequently instill respect in the workforce, managers must enhance their soft skills.

The Relevance of Lean Management to an Organization

According to Demeter and Matyusz (2011), lean approaches are relevant since they preserve competition and improve performance. After much deliberation, they came to the conclusion that companies implementing lean techniques typically have higher inventory performance turnover than those that do not adopt lean as a philosophy. Pearce and Pons (2013) make reference to the same idea as Demeter and Matyusz regarding the advantages of lean practices, but they go one step further and emphasize that the decisions made about which tools to use and when to use them are what ultimately give the organization a better standing when embracing lean practices. These two arguments raise important questions. The first is that, if all the other factors are properly set up, an organization's decision to adopt a lean approach will have long-term implications for the firm. The organizational culture is one of the crucial factors that must be taken into account. Another crucial factor is the dedication of the leadership and staff (Uwa, Ubong, and Etimfon, 2018).

Measures of Lean Management

Waste elimination

The process of determining and getting rid of procedures or activities that don't benefit the client or the company is known as waste elimination. It is a cornerstone of lean management, with the goals of increasing productivity and getting rid of waste in all its manifestations (James, 2020). Over time, waste removal has become a fundamental principle as a result of the efforts and contributions of numerous scholars, practitioners, and organizations. The "Seven Wastes" (or "Muda" in Japanese) that Ohno (1936) named are overproduction, waiting, transportation, overprocessing, inventory, motion, and flaws. Three stages comprise the waste reduction process framework:

Phase 1: There are three main tasks that make up waste documentation. VSM is first recognized by determining the location of customer value. All procedures involved in creating and providing goods and services to customers are included in the value stream. Organizations must be able to recognize different types of trash and comprehend waste. Waste can be divided into three main categories: (1) less obvious waste; (2) obvious waste; and (3) unobvious waste (Hopp and Spearman, 2004). The obvious waste category includes things like rework, superfluous inventory, unnecessary procedures, lengthy setup times, and malfunctioning machinery.

Phase 2: Waste analysis: During this phase, only one task—the waste root cause analysis—needs to be finished. Phase 1's outputs are needed as inputs for this phase. Experts in the business can easily carry out Root Cause Analysis (RCA) by adopting the brainstorming technique. As an alternative, the core reasons of each waste category can be illustrated using a cause-and-effect diagram.

Phase 3: Waste removal: There are two waste removal-related operations in this phase. To identify and prioritize the major waste categories, a waste record production process must first be carried out. Failure Mode and Effect Analysis (FMEA) ideas can be used to generate the record. In this instance, the failure to maximize resource utilization is proposed as waste.

Value Stream Mapping (VSM)

Value Stream Mapping (VSM) is a visual and strategic management tool that was developed from the lean concepts that the Toyota Production System introduced. It provides businesses with a thorough approach to evaluate, comprehend, and enhance their business processes. A comprehensive picture of the whole value stream is given by VSM, which includes the movement of information and materials from the start of production to the final delivery of a good or service to the client. Value Stream Mapping's primary goals are to find and remove waste, optimize workflows, and raise overall operational effectiveness. Through the use of standardized symbols in a visual representation, VSM enables cross-functional teams to cooperatively analyze the nuances of a process, promoting a common understanding of the creation and delivery of value. Two separate maps are created as part of value stream mapping: one for the current state and another for the future state. According to Uwa (2014), the current state map functions as a diagnostic tool that aids businesses in identifying inefficiencies, bottlenecks, and areas that require development. The future state map, on the other hand, offers a path for initiatives aimed at continual development by imagining an enhanced and more productive version of the process. Value Stream Mapping has shown to be flexible enough to be used to a variety of industries outside of manufacturing, such as software development, healthcare, and finance. Its use is not limited to the shop floor; it encompasses a wide range of business operations where it is essential to comprehend and enhance work and information flow. Value Stream Mapping, at its core, fosters an organizational culture of continual learning and adaptation by embodying the concepts of continuous improvement. In today's dynamic and competitive corporate climate, it helps teams to systematically identify and address inefficiencies, which ultimately contributes to better customer satisfaction, lower costs, and the delivery of higher value (Ukpong, Uwa, and Ekanem 2022).

Organizational Performance

For all organizations, whether for profit or nonprofit, the most crucial factor has always been the performance of the organization. To fully benefit from and take necessary action to make these changes, managers must be aware of the elements that impact an organization's performance. Performance is still a controversial topic, therefore organizational researchers disagree with one another on it. In Barney (2012). Organizational performance, according to Daft (2012), is the capacity of the organization to achieve its objectives through the effective and efficient use of its resources. Richardo (2016) defined organizational performance as the capacity of the organization to meet its goals and objectives, which is quite similar to Daft (2012).

Organizational performance, according to Cascio (2014), is the extent to which the work mission is attained as determined by the work outcome, intangible assets, customer link, and quality services. Organizational performance, according to Ekanem (2021), is the ability of the organization to use its physical and people resources to achieve its objectives in an effective and efficient manner.

This concept gives organizations the rationale to base their work-based performance evaluations on objective performance criteria. Uwa and Akpaetor (2018) suggest that performance can be articulated using a well-balanced collection of metrics that characterize the outcomes and methods utilized to get them. At least four forces must be balanced and interacted with in order for construction businesses to function well (Kaplan and Norton, 2015): (i) Production process efficiency (ii) Shareholders Satisfaction of customers (iv) Capacity of growth and development - staff skills (training, satisfaction), degree of innovation, and use of opportunities; shareholders' requirements met?

Value Stream Mapping and Organizational Performance

According to research, companies can reduce lead and production times by employing VSM to smooth manufacturing, which reduces waste and raises product quality (Ganji, 2017). VSM can assist businesses in meeting consumer needs, fostering agility, and cutting operating costs (Shah and Ganji, 2021). Ganji (2017), for example, found that value-added manufacturing (VSM) allows enterprises to optimize profitability and enhance operational performance, including waste and cost reduction. According to Ganji (2017), value stream mapping (VSM) has the ability to increase the visibility of the entire value stream, allowing for the identification of hotspots for food loss and waste. This, in turn, opens up a channel for information sharing that will undoubtedly contribute to the reduction of food loss and waste in an integrated food system. While Ganji (2017) has criticized the way it has been used, pointing out that significant constraints created by its application must be carefully examined as incorrect usage can lead to mistakes that can cause problems instead of benefits, particularly at the problem identification stage where much understanding and classification of problem is more important, others, like Shrafat and Ismail (2018), cited its lesser usage or even negative effect operational performance.

Waste Elimination and Organizational Performance

In order to cut costs and provide high-quality goods, environmental effects are becoming strategically important for corporate operations (Yang, 2021). According to Wong et al. (2012), waste management techniques alone have a negative relationship with the market and performance. However, the negative effects of waste management techniques on the market and organizational performance are significantly lessened by enhanced environmental performance (Yang, 2021). According to Laurence (2011), performance may be impacted by environmental management strategies either directly or indirectly. According to Wong et al. (2012), a company

that breaches an environmental legislation may have direct or indirect influence; in addition to paying fines and penalties, the company may also lose its reputation and earn a loss of trust. As a result, there can be a negative correlation between waste minimization goals and business profitability. Businesses could benefit financially from fostering a sustainable society by minimizing the quantity of waste that needs to be handled and disposed of (Sukholthaman and Sharp, 2022).

Theoretical Review

The Theory of Constraints (TOC) by Goldratt's (1984)

The fundamental idea is that most businesses, systems, and procedures have surplus capacity. Locating it and figuring out how to expose and take use of it are the challenges. The TOC provides you with the structure and tools necessary to locate the bottleneck or constraint and address it in a way that maximizes your available capacity. The theory of constraints (TOC), which acknowledges that the bottleneck resource dictates the throughput contribution of the plant as a whole, outlines strategies to maximize operating profit by identifying bottleneck operations. The identification of businesses with significant stock backlogs that require attention might help locate the bottleneck. An overview of the theory's evolution can be found in Jones and Dugdale (1998). A method for controlling variables, organizational decisions, manufacturing processes, and circumstances where there are restrictions in the current state is called the Theory of restrictions, or TOC. A tool for corporate management called TOC connects various industrial methods. It is a scientific methodology that enables a company, regardless of size, to link solutions to its most pressing issues in order to maintain continuous progress. Every organization has at least one major restriction that lowers their production capability. This is the fundamental tenet of the Theory of Constraints. Any component that exists in a system and keeps it from operating at its best is called a constraint.

Through the use of the Theory of Constraints, management can increase production capacity by managing the contribution margin and the product's unit production cycle in relation to its essential resources, or bottlenecks. A real-world system with more than three restrictions is improbable, according to TOC. This assertion is supported by linear programming models, which have the ability to resolve optimization issues for systems with hundreds or even thousands of constraints. Researchers discovered that all but a handful of these ideas would be totally unworkable in the noisy environment of a real-world system because they were so unstable. The quantity of limitations was strongly correlated with stability. There is less stability with additional limits. According to TOC practitioners, the practical limit is three restrictions. A significant implication of this is that managers can focus on optimizing performance in the areas of critical constraints or elevating the constraint (making it less restrictive) in order to manage a complex system or organization in a simpler and more efficient manner. This also results in a strategic perspective of the business, where all strategic choices are made based on the

restriction. The idea that variation (in production and material transfer times) prevents a balanced plant from operating at full capacity is another fundamental idea of the Theory of Constraints. Goldratt and Cox (2002) use a matchsticks-and-dice simulation where the participants act as production stations to demonstrate this idea. Every player passes on to the next player, during each turn, the lesser of his dice roll (i.e., the capacity of his station for that round) and the number of matchsticks he holds (i.e., the task awaiting his station). The simulated factory's overall production is somewhat lower even if each station has a theoretical average capacity of 3.5 units each turn. This is because high dice rolls, which are squandered when there is no work available, do not make up for the low ones. These are the basic steps in the Goldratt method for continuous improvement that are used to recognize, take advantage of, and control the limitations of any system, be it project management, manufacturing, distribution, or sales.

Empirical Review

Schwartz, Shun, and Xu, (2023). The connection between organizational performance and lean practices. The purpose of this study is to examine the connection between organizational performance and lean methods in a public institution—more especially, a military organization. The personnel of a military unit stationed in Rio Grande do Sul serve as the sample for this quantitative, descriptive study. A reliable sample of 116 completed surveys was acquired. Using the Smart-PLS software, multivariate statistical analysis—also referred to as structural equation modeling, or SEM—was used to analyze the data. Results: At the end of the research, the main hypothesis of the study could be verified, leading to the conclusion that lean practices—which include eliminating waste, continuously improving, providing support and leadership, involving members, providing education and training, thinking long-term, focusing on quality, and having a systemic vision—have a positive effect on organizational performance. These components work together to create organizational success and effectiveness by encouraging increased output, profitability, quality, and customer satisfaction, all of which enhance the operation of the business. Conclusions: It's clear that the military unit's members are dedicated to maximizing organizational performance. They consistently improve productivity, rarely make mistakes, reduce costs associated with activities and works, meet goals with high effectiveness, prioritize cost-cutting in activity execution, and accomplish goals and objectives pertaining to the services they provide.

Hashmi, Khan, and Haq (2023) the effect of implementing lean management on the operational performance of an organization, The goal of the research is to establish a consensus among various ways for operational improvement and to address the connection between an organization's operational performance and its operational characteristics (lean). Multiple regression analysis and correlation are the chosen data analysis techniques. The purpose of these tests is to demonstrate the relationship between operational performance and lean strategy. Findings and recommendations: Positive correlations are being found between repeat production, flow-oriented layout, daily schedule adherence, and operational performance. The supply chain

management is advised to include their production staff in order to increase productivity and reduce repetition in their work.

Antony, Swarnakar, Cudney, and Pepper, (2021). A meta-analysis examining the effects of lean methods on the performance of organizations. This study's goal is to use a meta-analysis using correlation methodology to look at published studies on the connection between organizational performance and lean techniques. This study examined the impact of lean methods on organizational performance using information from 40 publications that were published in reputable journals between 1993 and 2020. Within this framework, the research employed twelve lean methodologies and four distinct performance metrics, namely operational, financial, market, and environmental. The results show that there is a considerable and high positive correlation ($r = 0.37$) between aggregate organizational performance and lean techniques, using sophisticated meta-analysis software. Additionally, there is a substantial positive correlation with each and every performance outcome. The amount of information for the lean research community has greatly increased as a result of this study, particularly with regard to lean deployment in developing industries.

Fukuzawa (2020). Value stream mapping (VSM) research published in Western journals shows that using VSM as a lean technique enhances performance. But in these articles, VSM is used as a partial optimization tool to try to find and fix bottlenecks in certain departments and roles, particularly in production-related tasks. Because of this, the more VSM contributes to success, the more it departs from the fundamental principles of lean production and flow management. This can lead to poorer performance in the value flows that ultimately reach the customer while also promoting overall optimization by concentrating on the flows across the value chain.

METHODOLOGY

The study utilizes the survey research design approach. The population of the study comprised all the listed manufacturing companies in Akwa Ibom State totaling, 75 according to Ministry of Commerce and Industry gazette (2022). A total of 59 top, middle and lower level Management Staff of the selected manufacturing firms in Akwa Ibom State was adopted as the target population for the study. Based on this, the study adopted census technique by making use of the total population of 59 as sample size because the population was sizeable to handle by the researcher. The researcher adopted multi stage sampling technique, proportionate and purposive sampling techniques. In order to obtain adequate sample for the study, three (3) Firms out of 75 were selected base on the production line. The proportionate sampling technique was adopted to determine the specific number of sample elements. This was done in order to avoid bias. Purposive sampling, also known as judgmental, selective, or subjective sampling, is a form of non-probability sampling in which researchers rely on their own judgment when choosing members of the population to participate in their surveys. This was done to conveniently selects the three paint industries from thirty one (31) Local Government Areas in Akwa Ibom State

because of their sizes and managerial staff which have the knowledge required for this study. A total number of 59 questionnaire were administered to the top, middle and lower level Management Staff of the selected manufacturing firms in Akwa Ibom State. The instrument of data collection for this study was a structured questionnaire. The structured questionnaire were made of 12 questions which helped clarify responses gathered from the top, middle and lower level Management Staff on the subject under study. The research instrument had both face and content validity. Ordinal Logistic Regression were used in analyzing the data.

RESULT AND DISCUSSION

Table 4.1.2 Percentage Analysis of Responses on Value Stream Mapping

Value Stream Mapping	Extent of Agreement				
	SA	A	UD	D	SD
Value System Mapping help reveal the extent to which individuals or groups share similar values or hold divergent value systems	13 (26%)	26 (52%)	1 (2%)	4 (8%)	6 (12%)
We identify, analyze, and understand the values that guide individuals, groups, organizations, or even societies	17 (34%)	23 (46%)	4 (8%)	2 (4%)	4 (8%)
Value System Mapping can aid in personal development.	19 (38%)	21 (42%)	2 (4%)	2 (4%)	6 (12%)
It helps individuals gain clarity about their own values, which can serve as a compass for making life choices and decisions	27 (54%)	16 (32%)	1 (2%)	3 (6%)	3 (6%)

Source: Field survey 2023

Table 4.1.2 showed the frequency of responses and their percentages on Value Stream Mapping dimension. Of a proportion of 50 respondents, 13 (26%) strongly agreed to questions, 26 (52%) agreed, 1(2%) were undecided, 1 (2%) disagreed and 4 (8%) strongly disagreed, thus concludes that value system mapping help reveal the extent to which individuals or groups share similar values or hold divergent value systems.

Of a proportion of 50 respondents, 17 (34%) strongly agreed to questions, 23 (46%) agreed, 4 (8%) 4(8%) were undecided, 2 (4%) disagreed and 2 (4%) strongly disagreed, thus concludes that we identify, analyze, and understand the values that guide individuals, groups, organizations, or even societies

A proportion of 50 respondents, 19 (38%) strongly agreed to questions, 21 (42%), agreed, 2 (4%) were undecided, 2 (4%) disagreed, and 9.8 (8%) strongly disagreed, thus concludes that Question on value system mapping can aid in personal development.

It helps individuals gain clarity about their own values, which can serve as a compass for making life choices and decisions. Of a proportion of 50 respondents, 27 (54%) strongly agreed to questions, 16 (32%) agreed, 1 (2%) were undecided, 3(6%) disagreed and 3 (3%) strongly disagreed, thus concludes that effective salary contributes performance.

From the descriptive analysis it was concluded that 77% of the respondents showed positive agreement the questions raised on Value Stream Mapping while 23% were not. Showing that Value Stream Mapping positive relationship with organizational performance.

Table 4.1.3: Percentage Analysis of Responses on Waste Elimination

Waste Elimination	Extent of Agreement				
	SA	A	UD	D	SD
A higher waste diversion rate indicates more effective waste elimination efforts.	16 (32%)	24 (48%)	-	6 (12%)	4 (8%)
A higher recycling rate indicates better waste reduction efforts	17 (34%)	23 (49%)	3 (6%)	2 (4%)	3 (6%)
High composting rates contribute to waste elimination and environmental sustainability	19 (38%)	21 (42%)	2 (4%)	2 (4%)	6 (12%)
We track the reduction in the amount of packaging used for their products, aiming to minimize packaging waste generation.	27 (54%)	16 (32%)	1 (2%)	3 (6%)	3 (6%)

Source: Field survey 2023

Table 4.1.3 showed the frequency of responses and their percentages on the waste elimination. Of a proportion of 50 respondents, 16 (32%) strongly agreed to question, 24 (48%) agreed, none were undecided, 6 (12%) disagreed; 4 (8%) strongly disagreed that a higher waste diversion rate indicates more effective waste elimination efforts.

Of a proportion of 50 respondents, 17 (34%) strongly agreed to question, 23 (48%) agreed, 3(6%) were undecided, 2 (4%) disagreed; 3 (6%) strongly disagreed that a higher waste diversion rate indicates more effective waste elimination efforts.

A proportion of 50 respondents, 19 (38%) strongly agreed to questions, 21 (42%), agreed, 2(4%) were undecided, 2 (4%) disagreed, and 9.8 (8%) strongly disagreed, thus concludes that a composting rates contribute to waste elimination and environmental sustainability.

We track the reduction in the amount of packaging used for their products, aiming to minimize packaging waste generation. Of a proportion of 50 respondents, 27 (54%) strongly agreed to

questions, 16 (32%) agreed, 1 (2%) were undecided, 3(6%) disagreed and 3 (3%) strongly disagreed, thus concludes that waste elimination contributes performance.

From the descriptive analysis it was concluded that 88% of the respondents showed positive agreement the questions raised on waste elimination while 12% were not. Showing that waste elimination positive relationship with organizational performance

Table 4.1.4 Percentage Analysis of Responses on Organizational Performance

Organizational Performance	Extent of Agreement				
	SA	A	UND	D	SD
I can complete my task without wasting the organization's resources (time, finances, materials)	19 (38%)	21 (42%)	2 (4%)	2 (4%)	6 (12%)
The quality of the outcome of my work is highly commensurate with the input used in the production process	27 (54%)	16 (32%)	1 (2%)	3 (6%)	3 (6%)
My organization organizes training periodically to develop the skills of workers.	13 (26%)	26 (52%)	1 (2%)	4 (8%)	6 (12%)
The selection of production/operational process is as important as the quality of that process.	17 (34%)	23 (46%)	4 (8%)	2 (4%)	4 (8%)

Source: Field survey 2023

Table 4.1.4 A proportion of 50 respondents, 19 (38%) strongly agreed to questions, 21 (42%), agreed, 2(4%) were undecided, 2 (4%) disagreed, and 9.8 (8%) strongly disagreed, thus concludes that I can complete my task without wasting the organization's resources (time, finances, materials).

The quality of the outcome of my work is highly commensurate with the input used in the production process. Of a proportion of 50 respondents, 27 (54%) strongly agreed to questions, 16 (32%) agreed, 1 (2%) were undecided, 3(6%) disagreed and 3 (3%) strongly disagreed, thus concludes that effective salary contributes performance.

Of a proportion of 50 respondents, 13 (26%) strongly agreed to questions, 26 (52%) agreed, 1(2%) were undecided, 1 (2%) disagreed and 4 (8%) strongly disagreed, thus concludes My organization organizes training periodically to develop the skills of workers.

Of a proportion of 50 respondents, 17 (34%) strongly agreed to questions, 23 (46%) agreed, 4 (8%) 4(8%) were undecided, 2 (4%) disagreed and 2 (4%) strongly disagreed, thus concludes that the selection of production/operational process is as important as the quality of that process.

4.2 Test of Hypotheses

The ordinal logistic regression model was used to test the hypotheses when there is one dependent variable with more than two independent variables in categories, either sorted or unordered), and ordinal in nature. The null statements of hypotheses were stated as follows:

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	874.683			
Final	675.484	199.198	2	.000

Link function: Logit.

Information on the model's fit indicates that it has significantly improved over the null model; as a result, the model is displaying a good fit. With $p = 0.000$, the model is significant in this case. The final model and the intercept-only model should differ significantly from one another.

	Chi-Square	Df	Sig.
Pearson	2584.548	1943	.510
Deviance	644.795	1943	1.410

Link function: Logit.

If the significant value is less than 0.05, the goodness of fit statistic indicates an inadequate fit. The model here correctly predicted the data ($P > 0.05$). Both .510 and 1.410 are significant values. A value of 0 indicates that there are no significant deviations between the fitted (assumed) model and the observed data.

Cox and Snell	.869
Nagelkerke	.774
McFadden	.538

Link function: Logit.

Although they can be utilized as approximations of variation in the criterion variable, the pseudo R-square model indicates that it is not technically possible to explain the variation. The McFadden value of R^2 will be used in ordinal regression. In this instance, we can state that the

outcome prediction using the predictors has improved by 42.8% when compared to the null model.

Table 4.2.4 **Parameter Estimates**

	Estimate	Std. Error	Wald	Df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold [OP = 1.00]	20.100	17.664	1.295	1	.001	-14.522	54.721
[OP = 2.00]	32.897	19.412	2.872	1	.004	-5.149	70.944
[OP = 3.00]	39.851	19.684	4.099	1	.000	1.272	78.431
[OP = 4.00]	53.935	23.217	5.397	1	.002	8.431	99.440
Location VSM	3.246	3.069	1.119	1	.002	-2.769	9.260
Waste Elimination	3.298	2.969	1.235	1	.000	-2.520	9.116
[LS=1.00]	4.323	2.439	3.142	1	.000	-.457	9.102
[LS=1.00]	-1.417	12.054	.014	1	-.731	-25.043	22.209
[LS=2.00]	-.558	10.089	.003	1	-.860	-20.332	19.216
[LS=3.00]	-7.165	7.349	.951	1	-.910	-21.570	7.239
[LS=4.00]	-4.659	5.899	.624	1	-.603	-16.220	6.903
[LS=5.00]	0 ^a	.	.	0	.	.	.

Link parameter function: Logit.

a. This is set to zero because it is redundant.

4.2.5 Test of Parallel Lines^a

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	332.212			
General	312.203 ^b	20.009	4	.352

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

b. The log-likelihood value is practically not zero.

Interpretations of Results

The null hypothesis states that the location parameters (slope coefficients) are constant for all response types. The parameter estimations are displayed in Table 4.2.4, which also summarizes the effects of each predictor. The relative values of the component level coefficients and the sign of the covariate coefficients may offer important clues about the influence of the model's predictors. Variables with positive (negative) coefficients imply that the predictors and the criterion variable are positively (inversely) related.

The values of the ordinal logistic regression coefficients and intercepts are also shown in Table 4.2.4, together with the accompanying standard errors, t-values, and p-values. value stream mapping, 3.246; waste elimination, 0.002; organizational performance, 4.323; and PV, (0.000) are the new coordinates. This demonstrates that for every unit increase in the independent variable, there is an expected rise in the log probabilities of failing at a higher level of the dependent variable.

Any increase in a covariate's positive coefficient value indicates a better chance of ending up in a category with a "higher" cumulative outcome. A higher coefficient on a factor level denotes a greater possibility of falling into one of the "upper" cumulative result groups. The impact of a factor level on the reference categories determines the sign of a coefficient for that factor level. The variable in Table 4.2.4 with the highest coefficient and a p-value below the threshold for significance of 0.05 is regarded as the most important influencing factor. As a result, each independent variable's p-value is less than 0.05. This demonstrates that, at the 5% level of significance, each independent variable is statistically significant.

Interpretations of Tested Hypotheses

The null hypotheses were tested using ordinal logistic regression analysis. The following results were obtained as indicated in table 4.2.4.

H₀₁: There is no significant relationship between value stream mapping and organizational performance in in selected manufacturing firms in Akwa Ibom State.

Result of Hypothesis 1: Estimated location for value stream mapping, is 3.246, PV = 0.002. Where; VSM = value stream mapping, PV = Probability value, and OP = Organizational Performance (Threshold). The result in table 4.2.4 shows a significant influence of value stream mapping and organizational Performance in selected manufacturing firms in Akwa Ibom State. This is because the estimated location for value stream mapping is 3.246 when PV = 0.000. The probability value was less than 0.05.

Hypotheses Two: H₀₂: There is no significant relationship between waste elimination and organizational performance in in selected manufacturing firms in Akwa Ibom State.

Result of Hypothesis 2: Estimated location for waste elimination, is 3.024, PV = 0.003. Where; WE = waste elimination, PV = Probability value, and OP = Organizational Performance (Threshold). The result revealed a significant influence of waste elimination on organizational performance in selected manufacturing firms in Akwa Ibom State. This is because the estimated location for waste elimination is 3.024 when PV = 0.003. The probability value was less than 0.05.

DISCUSSION OF FINDINGS

This study examines the relationship between lean management and organizational Performance in selected manufacturing firms in Akwa Ibom State. An Ordinal logistic regression analysis was carried out to ascertain how lean management associates with organizational Performance in selected manufacturing firms in Akwa Ibom State. The ordinal logistic regression model was significant $p < .05$ with $df = 3$). The pseudo R^2 values (e.g. Nagelkerke. = 0.774=77%) presented in Table 4.2.3 indicates that the ordinal logistic regression model with its independent variables explained a relatively large proportion of the variation in organizational in selected manufacturing firms in Akwa Ibom State. This further indicates that a model containing value stream mapping and waste elimination most likely to be a very good predictor of the organizational performance. Furthermore, the result of the ordinal logistic regression analysis showed that value stream mapping and waste elimination were responsible for changes in organizational Performance in selected manufacturing firms in Akwa Ibom State. This was seen in the P -values all less than 0.05 level of significance. This implies that for any one unit increase in value stream mapping and waste elimination increases the chances for organizational performance given that all of the other variables in the model are held constant.

To examine the relationship between value stream mapping and organizational performance in selected manufacturing firms in Akwa Ibom State.

The result for hypothesis (H₀₁) of the ordinal logistic regression analysis showed that value stream mapping, associates with organizational performance in selected manufacturing firms in

Akwa Ibom State. This implies that for any one-unit positive increase in the level of value stream mapping will contribute to chances for organizational performance given that all of the other variables in the model are held constant. Therefore, this suggests that a significant influence that exists between value stream mapping and organizational performance. Hence, the null hypotheses were hereby rejected. This is in line with the work of Fukuzawa (2020). Studies of the value stream mapping (VSM) in Western journals report that leveraging VSM as a lean tool results in performance improvements. However, in these articles, VSM is functioning as a tool for partial optimization, attempting to identify and resolve bottlenecks in individual functions and divisions, primarily in production activities. For that reason, the greater the degree to which VSM underpins success, the more it deviates from the original essence of lean production and flow management, promoting overall optimization by focusing on the flows across the value chain, and potentially leading to poorer performance in the overall value flows up to the customer.

To ascertain the relationship between waste elimination and organizational performance in selected manufacturing firms in Akwa Ibom State

From table 4.2.4, the result from the test of null hypothesis (H_{02}) shows that waste influences organizational performance as P-value is less than level of significance (0.05). Therefore, this finding suggests that a significant and positive effect exists between waste elimination and organizational performance in selected manufacturing firms in Akwa Ibom State. Hence, the null hypothesis was hereby rejected. This finding is in line with the previous findings by Sherif, and Dumrak (2015) The capability to eliminate waste can lead to attaining environmental gains. Waste in any organizations is ranging from non-value adding activities to workplace hazards which can further lead to customers, employees and organizations dissatisfaction as well as environmental destruction.

CONCLUSION

From the study conducted, it was concluded that value stream mapping, and waste elimination, are relational dimensions that can influence organizational performance in selected manufacturing firms in Akwa Ibom State. The empirical results of the study clearly underscore the following: Value stream mapping, waste elimination, are significant positive determinants of organizational performance. Firms that consider the application of lean management dimensions are likely to record a better Key Performance Indicator (KPI) in the organization. Lean management is important because it not only enhances operational efficiency and reduces costs but also fosters a culture of continuous improvement and customer-centricity. Organizations that successfully implement lean principles often experience long-term success and resilience in an ever-evolving business landscape. Also, organizations that adopt lean principles often experience improved quality, increased efficiency, reduced costs, and higher customer satisfaction.

Suggestion for Further Studies

Based on the result of finding, it is suggested that a comparative study between the studied organization (which is a manufacturing firm) and a service organization should be carried to find out if the same results will be obtained. A study should be conducted to examine if work conditions will improve if organizations engage in lean management system.

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