

# Total Quality Management Practices And Organizational Performance

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**Abstract**—Most manufacturing companies in the developing nations on a daily base face different forms of sanctions by the government and social unrest with host community/society as a result of pollution from their waste which affects their performance. This study examined the effect of total quality management practices (Customer focus, top management involvement, employee participation, continuous improvement and by-products value optimization) on organization performance. The questionnaire was used to obtain data from 482 respondents (lower, middle and upper level employees) of manufacturing companies in Nigeria. A cross-sectional survey research and stratified sampling technique were used for the study while multiple regression analysis was employed to analyze the data. It was concluded that TQM practices portray enormous potentials for business re-engineering in companies. The findings showed that TQM tools assisted manufacturing companies to reduce/eliminate waste, environmental pollution and cost from compensation, increase customer patronage and company's success. The study recommends that by-product value optimization should be encouraged by organization as an avenue to convert waste into marketable products.

**Keywords**—Total quality management, organizational performance, Customer focus, top management involvement, employee participation, continuous improvement and by-products value optimization

## 1. INTRODUCTION

The quest for maintenance and enhancement of organizational performance, sustain competitive advantage, improve customer

satisfaction, improve production systems, product quality and reduce/ eliminate waste and cost has made the use of TQM imperative, especially in the manufacturing industry. It is interesting to note that most manufacturing, oil and gas companies in the world are involve in waste of materials. The oil and gas producing nations still involve in waste resulting from gas flaring. This sector has not been fully utilized as gas flaring keeps increasing. Flaring creates local air and noise pollution. Productive use of this gas would represent over \$20 billion of value at current prices. In Nigeria, Algeria, Iraq and Venezuela, gas markets and infrastructure are underdeveloped, and there is limited financial incentive to exploit associated gas [1]. The manufacturing sector is another sector where one can find waste and environmental pollution. In developing nations, some cement companies forward waste products to the river instead of converting it to chalk to enhance learning especially in the hinterland. Also, flour mills by-products are underutilized and used to pollute the environment instead of converting it to feed for livestock. Manufacturing companies operate in highly dynamic and competitive environment where achieving customer satisfaction, loyalty, patronage and improving organizational performance have become vital for their success and survival. The adoption and implementation of TQM seems to be the key managerial tool in the complex and turbulent business environment.

In an attempt to expanding the TQM models, this study will focus on theoretical and

practical perspectives of TQM. The theoretical perspective intends to provide a deeper understanding to TQM models. Prior researches revealed the implementation of TQM principles and practices or dimensions as an essential mechanism in influencing organizational performance. Reference [2, 3, 4, 5, 6] employed the critical success factors (CSFs) analysis of Pareto on TQM application between 1989 and 2003 identified the following as top eight CSFs of TQM: leadership, process control, managing suppliers, design of service, customer focus, employee relation, training and data quality. Reference [5] identified support of top managers, customer focus, and workers empowerment as the most effective aspects of TQM. The by-product value optimization goes beyond continuous improvement in features and quality of a product but rather converting waste into marketable product.

In addition to the above studies on TQM practice, the inclusion of by-product value optimization as TQM practice is to expand theoretically the TQM model. The practical perspective will assist organizations (manufacturing companies) understand the need to converting waste into marketable products which will generate revenue, reduce cost, increase customer's patronage and influence organization success. Also, by-product value optimization will assist companies save money from compensation, avert sanction from the government, social unrest by host community/society as a result of pollution from waste materials. It will provide the bases for policy makers and government to formulate policies that will influence organizations to eliminate/reduce waste and pollution in the environment. By-product value optimization (BVO) is the application of sophisticated technology and technical know-how in the manufacturing process and re-engineering to eliminate wastages and converting the waste to value-adding products so as to earn revenue, satisfy customers and improve organizational performance. This study seeks to examine the effect of TQM practices (Customer focus, employee participation, top management participation, continuous improvement and by-products value optimization) on organizational performance.

## 2. LITERATURE REVIEW

### 2.1 Theoretical framework

#### 2.1.1 Deming's total quality management theory (Deming, 1982)

Reference [7] postulated the 14 points quality management programme which an organization regardless of size or type of business are required to adopt as the basis for initiating and sustaining an organizational transformation/performance through total quality management. Deming asserts that any organization that adopts the 14 points is one that expect to defend its current market standing and remain competitive, improving the interest of investors and other stakeholders. Deming's 14 points of total quality management include; constant improvement of product quality, adoption of new philosophy (by-product value optimization), and elimination of dependence on mass inspection to ensure quality. Deming advised that businesses cease the use of price as the sole basis for resource allocation; be consistent in always improving operations system; implement and improve training; imbibe strong management; introduce friendly relationship and collapse hindrances among employees/departments. Also eradicate numerical goals for employees and management, remove exhortation, slogans, and targets for employees, and eliminate hindrances to the dignity of the workforce. Remove the practice of yearly merit and rating, create vigorous programme of training, retraining, and career development and top management involvement to accomplish the points listed.

The relevance of this theory to this study is that it shows managers and employees the contribution of all the elements in the activity system of an organization. Achieving quality is not just the function of those at the production or factory end of the organization, but of every individual, unit, material input that goes into or contributes, directly or indirectly, to the final output of the organization. Thus, workers must be trained and retrained to make effective decisions, be resourceful and avoid wastefulness (by product value optimization), management must get involved, not only by pushing down directives, but also in the factory floor to understand the feasibility of any policy. And very crucially, the theory allows organizational members to think from the perspective of the

customer in all their activities.

## 2.2 Conceptual framework

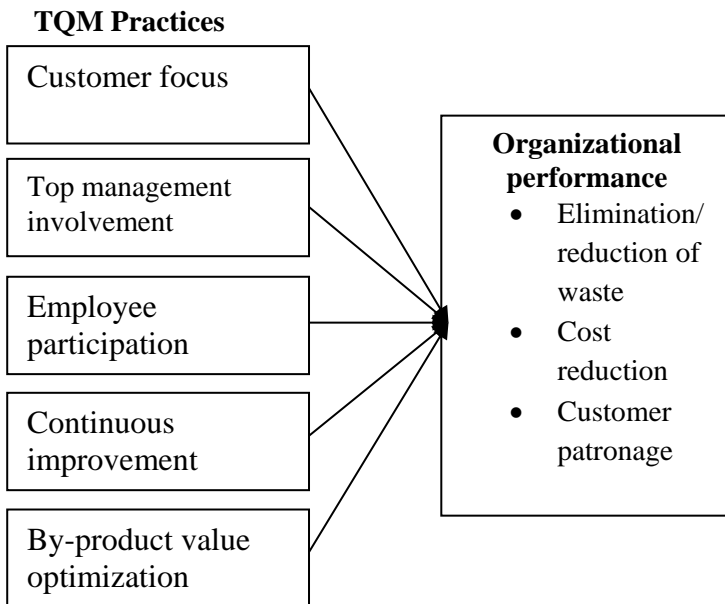


FIG. 1: Conceptual model: Total quality management practices – organizational performance model

The above model was adapted from Deming’s total quality management theory which includes five (5) practices/dimensions to portray the effect of TQM on organizational performance – customer focus, continuous quality improvement, employee participation, top management participation and by-product value optimization which were of major concern in the study environment.

### 2.2.1 Dimensions of TQM

**Customer focus:** The emphasis given to continuously satisfying the requirements and anticipations of customers by an organisation. Reference [8, 9] asserted that organizational success in this millennium depends on satisfying the requirements of customers effectively, efficiently, and on continuously. Emphasis on the perspective of the customer is an essential TQM practice which emphasizes on creating customer value which leads to improvement in organizational performance [10].

When an organization satisfies customers with their products, customer patronage, loyalty and retention tends to be achieved. This in turn will result to improvement in organizational

performance in terms of increase in sales volume. Reference [11, 12, 13, 14] opined that customer orientation is among the key drivers of performance enhancement and is positively associated with company performance.

**Employee participation:** Employees are organization most essential asset in improving firm’s performance. Employee participation is the involvement of employees in the day-to-day activities and decision making in an organization. To ensure employee participation, they need training, education and motivations to enhance their effectiveness and efficiency. Reference [15] concluded that employee’s participation in decision-making, information sharing and employee training is avenue that enables organization to utilize their resources efficiently which in turn improve firm’s performance.

**Top management participation:** Top management participation is the commitment of management in setting organizational goals, objectives and facilitating quality programmes for effective and efficient performance. Reference [16] concluded that top management participation gives direction for quality related goals achievement. This study proposes significant influence of top management participation on firm’s performance.

**Continuous improvement:** Continuous quality improvement is the reduction or elimination of defect and constant change in product features and quality. Manufacturing companies are expected to device means of eliminating defective production, while achieving improvements in the process of transforming resources into outputs. Reference [6, 17] asserted that continuous improvement employed by companies inspire employees for quality performance and innovations. This study proposes continuous improvement as a TQM practice to improve performance of manufacturing companies.

**By-product value optimization:** By-product value optimization is the means of converting waste product into actual product for sale; generate revenue for the organization and consumption by customers. This seems to go beyond improvement in product features and quality rather converting waste materials/ products into marketable commodities and eliminating wastage. This in turn enhances organizational performance. But implementation has to be

guided by the ISO convention on the waste conversion and processing (ISO 9001 of 2008) and that NIS certification of the Standards Organization of Nigeria which shows that the product has passed quality test.

### 2.2.2 Organizational performance

Organizational performance is the achievement of a company's goals or output of its activities. It describes the degree of success of an organization in the specific targets it sets out to accomplish, which will lead to realizing a bigger, broader goal and objective. Understanding and gauging a firm's performance level is critical to crafting appropriate strategic plans and daily decision making of the organization. Managers are concerned with performance as it shows the effectiveness of the decisions they make regarding alternative application of organizational resources.

Reference [18] noted that "measuring organizational performance was in the past limited more or less on financial measures in the form of revenue, profit, net operating income, ROA (Return on Assets), ROE (Return on Equity), ROS (Return on Sales) and other mostly revenue and profit related measures." As practical as the financial indicators of performance are, they are only historical records inadequate in determining the appropriateness of current operations or translating into competitiveness in the future. There are also operational and strategic or market perspectives to performance. What constitute performance can either be seen at the topmost level of management, middle management, and lower-level management. That is, every level has their target and indicators of performance. Thus, everything that shows success in reaching corporate goals constitutes organizational performance. Organizational performance is an umbrella term that encompasses all of how well an organization is doing in achieving its set goals and objectives. Reduction of waste, cost reduction and customer patronage are used as the operational measures of performance in this study.

*Waste reduction/elimination:* Waste is inevitable in organizations, especially manufacturing firms. Waste reduction is therefore the conscious efforts at keeping the amount of wastages that result

from the manufacturing activities of firms. It is a holistic method for preventing excesses and it combines a variety of actions to control all resources and manufacturing surpluses friendly to the environment, is cost-effective, and in line with social norms [19]. Since the central philosophy of TQM is to do things right or correct from the beginning, all the times [20]. Waste management can be achieved by maintaining an appropriate stock of raw materials, using standardised measurement for inputs, and avoiding unnecessary packaging of products.

*Cost reduction:* This is the tactics used by companies to keep the cost of operations at the minimum possible level and drive up their profitability. Cost reduction involves strategies that seek to reallocate resources so as to decrease operational problem and increase organizational performance, and it includes keeping track of spending, optimizing workforce and redesigning work processes. A paramount success factor in cost reduction is in understanding the activities that add value to the organization and those that do not [21, 22]. To make profits and remain competitive, companies have to minimize their costs, since profit is not only a function price or quantity sold, but also of the cost of production.

*Customer patronage:* Customer patronage seeks to gain the trust and loyalty of customers for future repetitive purchases. Customer patronage indicates the degree of customers' devotion to the offerings of an enterprise together with the strength of their propensity to choose the brand over competing brands.

### 2.3 The concept of TQM

The 21<sup>st</sup> century business environment urges TQM to be a managerial system and approach so as to enhance global competitiveness, customer satisfaction and organizational performance [23]. The emergence of TQM has heralded a new area and phase in operations research used globally by manufacturing companies. Total quality management (TQM) practices are essential in achieving performance enhancements in the manufacturing sector of the economy. TQM is a non-stop effort at achieving excellence in the management of waste, quality of products of a company and all its activities delivered through

the participation of all organizational members.

For manufacturing companies to improve performance, management is expected to invest more in quality programmes such as customer focus, continuous improvement in product quality delivery, top management-employee relationship, by-product value optimization, employees' training, and new infrastructure throughout the organization. TQM represents a continuous tactic for making better product achievable through employees' involvement throughout every hierarchical rungs and departments of an organization. TQM describes an organization-wide activity or initiative involving all employees, intended to improve effectiveness and quality of products offered to internal or external customers on continuous basis [24, 25].

TQM is an approach of performing business activities that ensures maximum organizational competitiveness through continuous improvement of products, processes, people and environment. TQM is a continuous improvement is performance, at all levels of operation, in each organization's functional areas, employing all resources available (human, material and money) [26]. TQM is a vital philosophy and provides maximum organizational success. TQM sets standards signifying the foundation for constant enhancement in firms. TQM assist organization to gain sustainable competitive advantage [27, 17]. The philosophy of TQM is that the processes of business operations have to centre on harmonizing the concepts of customer-focus, and perfection of deliveries.

## 2.4 Empirical review

### 2.4.1 Customer focus and organizational performance

Reference [28] conducted a study on how TQM affects organizational performance. The study was carried out among froze food enterprises in Macedonia. Examining TQM's influence on successes of firms was the focus of the study. A total of 120 employees responded to the questionnaire which provided data for the study. The result from the regression analysis showed that TQM implementation significantly improves performance, productivity and optimization of the quality costs.

Reference [6] conducted a study on how

TQM dimensions connect with performance among textile companies in Pakistan. One objective the study sought to achieve was to ascertain how customer focus relates with organizational performance. The study selected 197 textile mills, self-administered survey questionnaire were administered to 270 managers. 90 respondents were quality related managers while 18 were non-quality managers. Multiple linear regression analysis was used in analyzing the data. Results showed customer focus demonstrates a substantial connection with company success.

A research conducted by [9] on TQM practices on organizational performance among SMEs in Punjab Province of Pakistan. The study aimed at examining the connection of customer focus with some non-monetary indicators of performance among SMEs. Sixty (60) SMEs constituted elements studied. Data were generated using questionnaire and regression was employed for testing the data. Findings from the study revealed that performance is positively influenced by customer focus.

Reference [30] studied how some dimensions of TQM affect the performance of organizations in the Iranian oil industry. The study aimed at indicating the influence of customer orientation/drives on organizational performance. A total of 400 samples were used for the study. Path analysis plus structural equation technique were applied for testing the hypotheses in relation to conceptual model. The result showed that customer orientation had a positive influence on organizational performance.

### 2.4.2 Top management involvement and organizational performance

Reference [31] carried out a study on evaluating the effect has on service delivery of enterprises in Zanzan, Iran. 188 companies were randomly selected from Tehran stock exchange as the sample size. Data was analysed with structural equation method. Findings from the study revealed TQM as having substantial and positive influence on performance of organizations.

Reference [32] researched on TQM and organizational performance of firms in Pakistan's telecommunication sector. A sample of 212 respondents took part in the study. Findings from the study showed that TQM practices

(management support) had positive and strong influence on organizational performance.

#### *1.4.3 Employee participation and organization performance*

Reference [33] carried out an empirical study on application of TQM vis-à-vis success of service organizations in the wildlife subsector in Kenya. A sample of 60 respondents was administered with questionnaire. Data were analyzed using linear regression. Results of the tests hypothesis showed that TQM implementation (customer focus, the role of management, workers' participation, fact-based decision making, etc.) results in actual organizational performance. The study recommended that TQM principles should be properly incorporated for success implementation of TQM and organization success.

Reference [6] assessed the connection of TQM dimensions and firm performance. It aimed at determining the effect of employee participation on organizational performance. 270 respondents were sampled. Result from multiple regression analysis revealed that employee participation affect firm's performance. Reference [29] studied TQM's impact on the performance among Pakistani SMEs. The study examined how strategic indicators are affected by TQM dimensions. A sample size of 60 SMEs was used. The regression analysis indicated that employee participation influenced organizational performance of Pakistani SMEs.

#### *2.4.4 Continuous improvement and organizational performance*

Reference [34] conducted a study examining TQM practice impact on performance of an organization. The study was carried out in Koforidua, Ghana. 124 respondents constituted the sample for the study. Findings from the correlation analysis showed that TQM practices (employee involvement) had influences company success. It was concluded that some TQM practices in the firm were not fully implemented. The research recommended that Intravenous Infusions Limited Koforidua should put more effort in implementing those TQM practices which will assist to improve their performance.

Reference [6] analyzed the association of TQM dimensions with organizational

performance in Pakistan. 90 copies of research questionnaire were administered to respondents. The study sought an observation of the influence of continuous improvement on organizational performance. 270 managers from 90 enterprises in Pakistan's textile industry participated. Questionnaire was designed, applied, and data were gathered. Regression analysis results showed continuous improvement with a substantial influence on firms' wellbeing.

Reference [35] evaluated how TQM and related quality enhancement approaches relates with performance of SMEs in Australia. 62 firms were involved in the study. Using the quality standards in Australia, data were generated to define the association of TQM with an organization's performance. The study observed a substantial connection between continuous improvement and the SMEs' performance. Reference [36] studied TQM in the University of Malaya, Kuala Lumpur, Malaysia. The study concluded that continuous improvement goes beyond enhancing student's performance to equally preparing them to comprehend, withstand and improve the society they work and live in.

A research carried out by [37] on TQM's impression on organizational success, responses from 86 different firms in Pakistan were obtained through questionnaire and random sampling. The data were statistically analyzed with graphs and multiple techniques by employing mini-tab software. The study indicated that TQM practices (constant enhancement, workers' involvement, leadership and customer orientation) have positive and substantial impact on organizational performance.

#### *2.4.5 By-product value optimization and organizational performance*

Little or no study has been carried out on by-product value optimization and organizational performance. This study aimed at revealing how conversion of waste material/products into marketable product can influence firm's performance. The by-product value optimization goes beyond mere improving the product feature, rather transforming waste items into products that can be offered for sale to consumers.

### **3. Materials and methods**

The design for this study was cross-sectional. Cross-sectional studies involve amassing facts from a portion of a population of interest. Reference [38] noted that samples are good because the selected elements possess features or characteristics that are common to all members of a universe. Adoption of this design was because it enables the unraveling and examination of effect and cause relationship between variables, in this case TQM practices and performance of manufacturing companies. Here, the study area was divided into three stratas: top, middle and lower workers. 500 copies of the questionnaire were administered to respondents in 20 manufacturing firms in Nigeria and 482 were correctly filled, returned and used for the study. Data were collected using primary source. A questionnaire was designed for this purpose.

Total quality management (TQM) was measured by customer focus (4 items), top management participation (4 items), employee participation (4 items), continuous improvement (4 items) and by-product value optimization (3 items) through asking staff to indicate their opinions from statements in the research questionnaire. The researcher used 5 points Likert scale of strongly agreed, agreed, undecided, disagreed, strongly disagreed in measuring respondents' responses to the research statements in the questionnaire.

Organizational performance was measured by elimination/reduction of waste, cost reduction and customer patronage using 5 points Likert scale from statement (3 items) in the research questionnaire with strongly agreed, agreed, undecided, disagreed, strongly disagreed. In order to ensure effectiveness, the research instrument (questionnaire) used in this study was subjected to some evaluation criteria and this was done to ensure that the instruments used are valid and reliable. Before the questionnaire was administered, a pilot study was carried out on a selected few employees of manufacturing firms in Nigeria and the purpose of the pilot survey was to ensure the validity of the questions and reliability of the questionnaire to collect relevant data. Additionally, professional judgment about the validity of the questionnaire from experts in statistics was carried out by the researcher. Multiple regression analysis was utilized for data analysis.

#### **4. Result and discussion of findings**

##### *4.1 Test of hypothesis*

H<sub>0</sub>: Total quality management (TQM) practices have no significant effect on organization performance.

**Table 1**

Model summary showing effect of customer focus, top management involvement, employee participation, continuous improvement, by-product value optimization on organizational performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
ss1	.968 <sup>a</sup>	.937	.936	.51574

a. Predictors: (Constant), Customer focus, top management involvement, employee participation, continuous improvement, by-product value optimization

**Table 2**

ANOVA<sup>a</sup> showing effect of customer focus, top management involvement, employee participation, continuous improvement, by-product value optimization on organizational performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1874.460	5	374.892	1409.459	.000 <sup>b</sup>
	Residual	126.874	477	.266		
	Total	2001.333	482			

a. Dependent Variable: Organizational performance

b. Predictors: (Constant), Customer focus, top management involvement, employee participation, continuous improvement, by-product value optimization

**Table 3**

Coefficients<sup>a</sup> showing effect of customer focus, top management involvement, employee participation, continuous improvement, by-product value optimization on organizational performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.293	.162		1.812	.071
	Customer focus	.047	.020	.058	2.369	.018
	Top management involvement	.000	.035	.000	.013	.990
	Employee participation	.099	.026	.122	3.889	.000
	Continuous improvement	.496	.052	.494	9.533	.000
	By-product value optimization	.219	.026	.319	8.454	.000

a. Dependent Variable: Organizational performance



Tables 1, 2 and 3 above report the results of multiple regression analysis carried out to test hypothesis. The results show that there is a significant joint effect of customer focus, top management involvement, employee participation, continuous improvement, by-product value optimization on organizational performance (b: customer focus = 0.047, top management involvement = 0.001, employee participation = 0.099, continuous improvement = 0.496, by-product value optimization = 0.219). Therefore, null hypothesis is rejected. Tables 1 and 2 further report a significant *F* statistic, indicating the model's strong prediction strength ( $F = 1409.459$ ,  $R^2 = 93.7\%$ ,  $p < 0.05$ ). The  $R^2$  of 93.7 per cent implies that for every unit change in organizational performance, 93.7 per cent of such variation is jointly attributed to customer focus, top management involvement, employee participation, continuous improvement and by-product value optimization.

#### 4.2 Discussion of findings

##### 4.2.1 Customer focus and organizational performance

Customer focus describes how well the anticipation and requirements of customers are continuously satisfied by an organization. The results show that customer focus does substantially affect organizational performance. This study was in support of [29] and [39] who studied TQM's influence on organizational performance. Findings indicated that performance of SMEs, banks and oil industry respectively, were positively influenced by customer focus/orientation. That customer focus is an essential TQM practice which emphasizes on creating customer value which leads to improvement in organizational performance, deserves an important mention.

##### 4.2.2 Top management involvement and organizational performance

Top management involvement is the commitment of management in setting organizational goals, objectives and facilitating quality programmes for effective and efficient performance. The results show that top-management support does

substantially affect Organizational performance. Reference [6] and [32] examined TQM and its influence on organizational performance and revealed management support positively influence organizational performance.

##### 4.2.3 Employee participation and organization performance

Employee participation is the inclusion of workers in the regular undertakings and taking decisions in an organization. The result reveals that employee participation does substantially affect performance of organization. This research finding was in support of studies by [6] and [29] who studied the connection of TQM dimensions and firm performance, aimed at determining the effect of employee participation on organizational performance. The study revealed that employee participation affected firm's performance.

##### 4.2.4 Continuous improvement and organizational performance

Continuous improvement involves reduction or elimination of defect and constant change in product features and quality. The results show that continuous improvement does substantially affect organizational performance. This research finding was in tandem with that of [6, 36, 35] on TQM dimensions association with organizational performance. Findings indicate continuous improvement's substantial influence on organizational performance. Organisational success in this millennium depends on satisfying customers' needs effectively and efficiently on continuous basis.

##### 4.2.5 By-product value optimization and organizational performance

By-product value optimization is the means of converting waste product into actual product for sale by the organization and consumption by customers. The result shows a substantial influence of by-product value optimization on organizational performance. The by-product value optimization goes beyond mere improving the product feature, rather transforming waste items into products that can be offered for sale to consumers.

## 5. Conclusion

The conclusion arising from this research on “total quality management practices and organizational performance of manufacturing companies” is as follows: Customer focus is a vital TQM practice that creates customer value which leads to improvement in organizational performance. Involving employees in taking decisions on their job tasks, sharing information and training helps in the efficient utilization of organizational resources; thus improving performance among manufacturing companies. Employee participation remains an indispensable TQM practice that influences companies’ performance.

The participation of top-level management in goals-setting is critical to provide direction and focus towards improving performance and product quality. Management support possesses positive and strong influence on organizational performance. Continuous improvement directs manufacturing companies on how to achieve their goals, improve product quality, and satisfy needs of customers and ensuring organization’s performance. Continuous improvement enhances organizational performance and inspires workers for innovation and quality performance. The by-product value optimization goes beyond mere improving the product feature, rather transforming waste items into products that can be offered for sale to consumers.

Consequently, customer focus should be applied by manufacturing companies in identifying, anticipating and satisfying consumer’s needs beyond expectation. Continuous improvement should be regular in improving product quality, process and satisfying customer needs, inspiring workers for innovation towards ensuring organizational performance.

Also, manufacturing companies should ensure employee participation in decision-making, information sharing and employees training as these tend to improve workers performance and in turn influence the overall performance of an organization. By-product value optimization should be encouraged by organization as an avenue to convert waste into marketable items that will satisfy consumers, reduce environmental pollution, save monies which would have been used in compensating

host community/society as a result of pollution from waste materials and generate revenue for the organization.

Finally, top management of manufacturing companies should invest in acquiring state-of-the-art technology that will convert waste into new products or even into energy so as to improve organizational performance. This is the era of biofuels and with techno-vision; some technologically- advanced countries are converting bio-waste and other derivatives into energy fuels. Manufacturing companies should regularly engage in training and retraining of staff especially when old technology becomes updated or new technology is acquired. This builds up manpower and capacity for employees’ participation in total quality improvement thereby improving organizational performance.

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