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Full Length Research

The Practice, Challenges and Benefits of Total Quality Management (TQM) In Manufacturing Firms in Nigeria

[1]Isaac A. Ayandele and [2]Anietie P. Akpan

[1]Department Of Business Management, University Of Uyo, Uyo, Nigeria
[2]Department Of Business Management, University Of Uyo, Uyo, Nigeria.
Corresponding author's E-mail: shalomdivyne@yahoo.com

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Though the definitions of Total Quality Management (TQM) across the globe seem similar, there is still confusion as to what sort of practices, policies and activities needed to be implemented to fit into TQM model. Recent experiences been shown that any business improvement programmes were quick to be termed TQM, thus watering down the content and intention of the term. This study examines the practice, challenges and benefits of TQM in Nigerian manufacturing firms and discovered among others that while a significant reduction in operating expenses and manufacturing costs were recorded, workers were also found addressing different issues in the name of TQM. The study concludes that careful and objective implementation of TQM will enhance the innovative and technological capability of the firm thereby boosting her goodwill. The study recommends that for any manufacturing firm in Nigeria to succeed and enjoy the benefits of TQM, it must carefully scrutinize itself to ensure that it has the necessary financial resources, moral will power and top management support.

Keywords: Quality control, innovation, kaizen, Bye-Product, Teamwork, Customer-Centered.

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INTRODUCTION

Background to the Study

The need for an organisation to adopt the practice of continuous improvement in the face of increasing competition and challenging operations cannot be over-emphasized. The global economic meltdown, over increasing competition among firms and greater enlightenment of consumers have continued to intensify the demand for high quality goods and services and the creation of quality culture beyond the relatively unclear managerial statements about the need for leadership education and recognition. It is therefore, very clear and pertinent that quality has become a universally defined term of customer perception and expectation rather than in terms of production specialization and relative increase in customer requirements and perception.

Nowadays, it is extremely difficult to tune on the television set, listen to radio or read through the pages of newspapers without finding the word "Quality". This emphasizes the relevance of quality to both the manufacturer or provider of services and the general public. In view of this trend, it follows that for

organizations to stay in operation, they must adopt quality control and qualitative managerial principles. This is why the relevance of Total Quality Management cannot be over-emphasized in this dynamic, complex, highly competitive and perilous business environment.

However, quality management has been defined differently by different authorities and practitioners. Kaynak (2003) defines it as the attainment of operational control and superior quality through a pervasive and enterprise – wide commitment to quality. Oakland (2005) calls it "Continuous customer driven improvement". In like manner, Besterfield et al (2008) define it as the application of qualitative methods and human resources to improve all the processes within an organization and exceed customers' needs now and in the future. Generally, it is a management philosophy that seeks to integrate all organizational functions to focus on meeting customers' needs objectively. It attempts to move the focus of quality away from being a purely operations' activity into a major concern for the whole organization; through total quality management quality becomes the responsibility of all units, departments and sections in the organization.

However, in spite of all the aforementioned, there seems to be many persons and organizations that are not well informed of the concept, theories, practices, challenges and benefits of total quality management in Nigeria, hence this study.

STATEMENT OF PROBLEM

Studies on the subject of Total Quality Management and other related subjects globally have indicated that there exist considerable potential benefits in implementing Total Quality Management**.** However, in contrast to this there are several organizations in Nigeria (banks and manufacturing firms) that have in the recent past publicly professed TQM and are moribund or have gone underground today. The questions that agitate the mind now are "Do the practitioners of TQM in Nigeria focus mainly on meeting and exceeding customers' needs? How is TQM practiced in Nigerian Manufacturing firms? Is the practice of TQM in Nigeria different from the way it is in other countries? What are the peculiar challenges and prospects in implementing TQM as a Management technique in Nigeria? Is Nigerian economic environment conducive for the practice of TQM? This study provides answers to these and several other related questions.

OBJECTIVES OF THE STUDY

The main objective of this study is to examine the practice, challenges and prospects (benefits) of TQM in Nigerian Manufacturing firms using Nigerian Breweries Plc, as a case study. Other objectives include to:

i. determine the effect of TQM on the products of Nigerian Breweries Plc;
ii. ascertain the effects of TQM on the operational costs of Nigerian Breweries Plc;
iii. establish the effects of TQM on the corporate image of Nigerian Breweries Plc, and
iv. find out if there exist any significant problem(s) militating against the effective implementation of TQM in Nigerian Breweries Plc.

Research Questions

The following research questions were formulated in line with the objectives of the study. They are:

1. Does TQM impact significantly on the quality of products of Nigerian Breweries Plc?
2. Does TQM significantly reduce the operating cost of Nigerian Breweries Plc?
3. Has TQM impacted on the corporate image of Nigerian Breweries Plc?
4. Are there any significant impediment(s) militating against the effective implementation of TQM in Nigerian Breweries Plc?

Research Hypotheses

The underlisted hypotheses were formulated to guide the conduct of this study. They are in their null (Ho:) form.

Ho_1: TQM has no significant impact on the quality of products of Nigerian Breweries, Plc.

Ho_2: TQM has not significantly reduced the operating cost of Nigerian Breweries, Plc.

Ho_3: TQM has not impacted positively on the corporate image of Nigerian Breweries, Plc.

Ho_4: There are no significant problems militating against the effective implementation of TQM in Nigerian Breweries, Plc.

REVIEW OF RELATED LITERATURE

To have an understanding of the concepts, and theories of Total Quality Management and to develop the building blocks upon which the discussion of the findings in this study were based, the review of related literature was done under the following sub-headings – conceptual, theoretical and empirical frameworks.

Conceptual Framework

Nature and Evolution of Total Quality Management

The American Federal Office of Management Budget Circular (cited in Arawati (2005 p.209) defines Total Quality Management (TQM) as a total organizational approach for meeting customer's needs and expectations that involve all managers and employees in using quantitative methods to improve continuously the organization's processes, products and services. According to this definition, TQM is not merely a technical system. It is associated and linked with the organization itself which is also a social system. In the opinion of Oakland (2000), TQM is an attempt to improve the whole organisation's competitiveness, effectiveness and structure. According to Dale (1996), TQM is the mutual cooperation of everyone in an organization and associated business processes to produce products and services, which meet and hopefully, exceed the needs and expectations of customers. Accordingly, TQM is both a philosophy and a set of management guiding principles for managing an organization. Esin and Hilal (2014) define Total Quality Management as a firm-wide management Philosophy of continuously improving the quality of the products/services/processes by focusing on the customers' needs and expectations to enhance customer satisfaction and firm performance. Davood et al (2013) see TQM as a systematic quality improvement approach for firm-wide management for the purpose of improving performance in terms of quality, productivity, customers satisfaction and profitability. For a more elaborate definition, Soltani (2005) says that TQM is a strategy that affects everyone in an organisation and embraces all aspects of operating system. It includes "hard system" to which the quality of flows or the results of operations can be assured through the aid of statistical quality control techniques and "people focused" systems and approaches that help individuals and teams "do the correct things" or "do things right".

From the above definitions, it can be seen that TQM is made up of management tools and techniques as well as management concept and principles. TQM is a continuous activity that must be entrenched in the work culture of any organization embracing it. It is not just a one-shot, here-today-gone-tomorrow programme.

Evolution of TQM

Historical Development of Total Quality Management

The history of quality management, from mere inspection to total quality management, has led to the development of essential processes, ideas, theories and tools which are central to organizational development, change management and the performance improvements that are generally desired for individuals and organizations.

During the early years of manufacturing, inspection was used to decide whether a worker's job or product met the requirements. It was not done in a systematic way, but worked well when the volume of production was reasonably low. But as organizations grew, the need for more effective operations became apparent. However, in 1911, Frederick W. Taylor helped to satisfy this need. He published "The Principles of Scientific Management", which provided the framework for the effective use of people in industrial and manufacturing organizations (Imaga, 2000). One of his concepts was "clearly defined tasks performed under standard conditions". Inspection was one of those tasks intended to ensure that no faulty product left the factory or workshop. By this time the quality inspection system focused on the product and the detection of problems in the product, it involved testing every item to ensure that it complied with the product specifications and was carried out at the end of the production process by skilled, trained inspectors. This movement led to the emergence of a separate inspection development and the birth of quality control/management.

Quality control was introduced to detect and mend problems along the production line, to prevent the production of faulty items. Statistical theory played a key role in quality control. In the 1920s, Dr. W. Sherwhart developed the application of statistical methods to the management of quality. He made the first modern control charts and demonstrated the variation in the production process that resulted in variation in the product. Logically, eliminating variation in the process made for a high standard end product.

In the 1940s, Japanese products were perceived as cheap, shoddy imitations and substandard as compared with products from Europe and America. Japanese Industrial Leaders recognized this problem and aimed at producing innovative high quality products. They invited some quality experts which included Edward Deeming, Juran and Feigenbaum to teach their organizations how to achieve their goals in five (5) years. Not many Japanese believed them.

However, some Japanese trusted and followed Deming's and other experts' advice and emerged leaders in technology with a strong reputation for high quality (Kaynak, 2003). In the 1950's quality control and management developed quickly and became a main theme of Japanese management. The idea of quality did not stop at the management level but quickly spread throughout the entire organization as Water Shewart's statistical sampling techniques and the creation of specification standards became the core of quality system (Mark, 2014). Quality circles (the Japanese version of continuous improvement team) according to Ishikawa (1985) started in the 1960's. A bye-product of

quality circles was employee motivation. Workers felt that they are involved, valued and listened to. Another bye-product was the idea of improving not only the quality of the products but also every aspect of organizational life. This consciousness probably marked the genesis of total quality management.

The term total quality management was first used in a paper presented by Armand Feigenbaum at the first international conference on quality control in Tokyo, Japan in 1969. The term referred to wider issues within an organization. In Total Quality Control, Robins and Judge (2007:106) define TQM as follows:

> *A quality system is the agreed on, company wide and plant wide operating work structure, documented in effective, integrated technical and managerial procedures, for guiding the coordinated actions of the people, the machines, and the information of the company and plant in the best and most practical ways to assure customer quality satisfaction and economical costs of quality.*

Accordingly, new phase of quality control and management began, known as Total Quality Management (TQM) in the 1980s and 1990s. Having observed Japan's success of employing sound quality techniques, Western companies started introducing their own quality initiatives. Though the definitions of Total Quality Management across the globe seem similar, there is still confusion as to what sort of practices, policies and activities needed to be implemented to fit into the TQM model. This was because any business improvement programme was quick to be termed Total Quality Management, thus watering down the term (Isaac, 2004).

With quality management initially tied to and associated with manufacturing industries, one might assume that the importance and relevance of quality management might decrease with the emergence of the service economy. Quite the contrary, the emergence of the service economy has only served to strengthen the importance of quality issues (Su mi and Jens, 2015).

Principles of Total Quality Management

Successful total quality management is anchored on the following four broad principles:

a. Do it right the first time: This is anchored on the saying of Schonberger (1980) who studied many Japanese and US factories firsthand. He contends that "errors, if any, should be caught and corrected at the source, i.e. where the job is performed".

b. Be Customer-Centered: Everyone has one or more customers in a total quality management organization. They may be internal or external customers. Internal customers are the members of the organization who rely on your work to get their job done. Regarding external customers, total quality management requires all employees who deal directly with outsiders to be customer-centred. Being customer-centred means:

a. Anticipating the customers' needs
b. Listening to the customer
c. Learning how to satisfy the customer and
d. Responding appropriately to the customer and viewing him as a "god"

c. Make continuous improvement a way of life. The Japanese word for continuous improvement is KAIZEN, which means improving the overall system by constantly improving the little details. TQM managers dedicated to KAIZEN are never totally happy with things in their organizations. Kaizen practitioners view quality as an endless journey, not a final destination. They are always experimenting, measuring, adjusting and improving. Rather than naively assuming that zero defects mean perfection has been achieved, they search for potential and actual trouble spots. (Hendricks and Singhal, 1997)

Below are the four (4) general avenues for continuous improvement:

- Improved and more consistent product and service quality.
- Fast cycle times (in cycles ranging from product development to order and to payroll processing)
- Greater flexibility (for example, faster response to changing customers' demands and new technology)
- Lower costs and less waste (e.g. elimination) needless steps scrap, rework and non-values adding activities.

d. Build Teamwork and Empowerment: Total Quality Management empowers employees at all levels in order to tap their full creativity, innovativeness and commitment. Empowerment occurs when employees are adequately trained and provided with necessary working tools and facilities.

Quality Control Versus Total Quality Management

While other quality assurance or control measures make

room for defective products, Total Quality Management (TQM) emphasizes total elimination of defects through making items right, first time, every time (Kannan , 2005). In contrast to the traditional quality control procedures, total quality management places much more responsibility on the workers to monitor their own output of products rather than entrust that function to a separate quality control department (Besterfield et al, 2008). Total Quality Management involves everyone in the organization including those who might judge that their moral line of duty does not involve quality. Total Quality Management seeks to identify the true and total costs related to a quality e.g. the cost of reworking the material or product that has been rejected.

The contrast between the previous state of an organization without TQM and the TQM state is demonstrated by Besterfield, et al (2008) in table 1.

(The Ten Conditions Necessary for Successful Implement of Total Quality Management Programme

Total Quality Management (TQM) is viewed as virtually a new organizational culture and way of thinking. It is specifically built around intense focus on customer satisfaction, on accurate measurement of every critical variable in a business operation, on continuous improvement of products, services and processes, and on work relationship based on trust and team work. Oakland (2005), suggests ten (10) essentials of implementing total quality management. These are:

1. Define Quality and Customer Value: Rather than leaving these to individual interpretation, company personnel should have a clear definition of what quality means in the job department and throughout the company. It should be developed from your customer's perspective and communicated as written policy.
2. Develop a customer orientation: Quality is best viewed and appreciated from the perspective of the customer, much as beauty is in the eye of the beholder. The firm should not only rely on secondary information in trying to guage customer perception or rating of the quality of its goods and services – rather it should attempt to do so by placing suggestion boxes, notebooks and score sheets and inviting opinion from the customers of the organization. It is also pertinent to recognize internal customers. Usually less than 20% of the company's employees come into contact with external customers, while the other 80% serve internal customers – other units with real performance expectations. The value chain in figure 1 provides an important way to think about the customer orientation, particularly to recognize internal as well also external (ultimate) customers.
3. Focus on the Company's Business Processes: This entails breaking down every minute step in the process of providing the company's product or service and looking at ways to improve it rather than focusing simply on the finished product or service.
4. Develop Customer and Supplier Partnership: Organisations have a destructive tendency to view suppliers and even customers adversarily. It is better to understand the horizontal flow of business from outside suppliers to internal suppliers/customers (a company's various departments) to external customers.
5. Take a preventive approach: Many organizations reward "fire fighters" not "fire averters", and identify errors after the harm has been done. Management instead, should be rewarded for being prevention-oriented and seeking to eliminate non-value-added work.
6. Adopt an error free altitude: Instill an attitude that "good enough" is not good enough anymore. "Error free" should become each and individual's performance standard with managers taking every opportunity to communicate the importance of this directive.
7. Get the facts: Continuous improvement – oriented companies make decisions based on facts, not on opinions.
8. Encourage every manager and employee to participate: Employee participation, empowerment, and extensive training in quality and statistical techniques, and in measurement tools are the main ingredients required to ensure continuous improvements.
9. Create an atmosphere of total involvement: Quality management cannot be the job of a few managers or of one department. Everybody must be involved.
10. Strive for continuous improvement:

Empirical Analysis

Robins and Judge (2007) carried out a ten (10) year study on Total Quality Management by selecting a group of 600 publicly traded organizations that had won awards for effectively implementing TQM. A control group similar in size and industry to the award winners was also used for the study. The performance of both groups was compared during the five (5) years prior to the award and five years after winning the award. No difference was noticeable between the two groups prior to winning the award. However, as shown in Table 2, the award group far outstripped the control group during the five year

Table 1: New and Old Culture of Quality Control

S/N	Quality Element	Previous Non-TQM State	TQM State
1.	Definition	Product-oriented	Customer-oriented
2.	Priorities	Second to service and cost	First among equals of service and cost
3.	Decisions	Short-term	Long term
4.	Emphasis	Detection	Prevention
5.	Errors	Operations	Systems
6.	Responsibility	Quality Control	Everyone
7.	Problem-solving	Managers	Teams
8.	Procurement	Price	Life-cycle costs, partnership
9.	Manager's role	Plan, assign, control and enforce	Delegates, coach, facilitators and mentors

Source: Total Quality Management, Besterfield et al (2008)

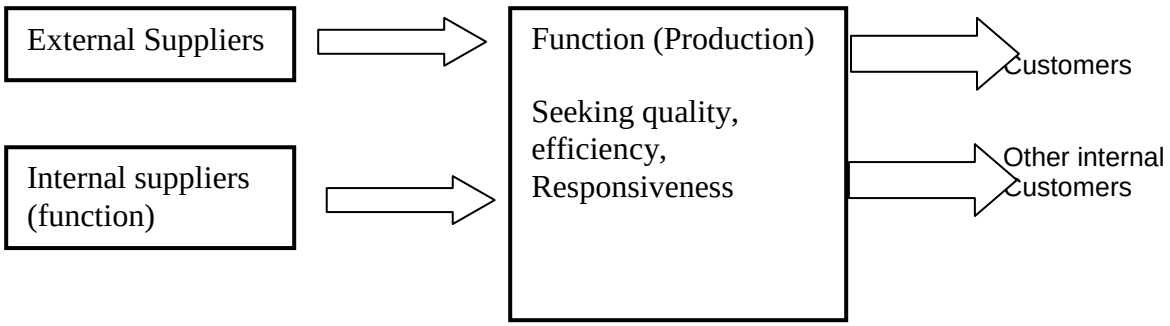

Figure 1: Customer Orientation Value Chain
Source: Oakland – Total Quality Management (16(8), p 1054

Table 2: Comparison of Performance of TQM Award Winning Companies with Non-TQM Companies

S/N	Description of Index	Control Group	Award Group
1.	Growth in operating income	43%	91%
2.	Increase in Sales	32%	69%
3.	Increase in Total Assets	37%	79%

Source: Dale et al (2008:13)

period after the award (Robins and Judge, 2007).

The study also showed that the stock price performance for the award winners was 114% while those of the control group were 80%. In addition, the study showed that small organization out-performed larger organizations. Further, recent studies have shown that only 30% of manufacturing companies have successfully implemented TQM where over 50% of service-based organizations have successfully implemented the programme. In another survey of manufacturing firms in Georgia, United states, the benefits of TQM were discovered to be, improved quality, employee participation, teamwork, better inter-personal relationships, customer satisfaction, employee satisfaction, improved productivity, communication, profitability and market share (Hendricks and Singhal, 1997).

Similarly, recent studies have examined the relationship between total quality management and various levels of business performance (Kaynak, 2003).

Although many results of prior studies supported the positive effect of TQM on organizational performance (Hendricks & Sighal, 1997; Kaynak, 2003), there were several researches which found out that the implementation of TQM might lead to ineffectiveness of firm performance (Dale et al., 1998).

According to Kaynak (2003), the reason for the differences in the outcome of results of these aforementioned studies is probably because of the nature of the research designs (such as using TQM practices of business performance as a single construct).

Theoretical Perspective

In this study, we reviewed the combination systems Theory and Synergy in explaining the practice, challenges and prospects of Total Quality Management. It should be noted also that for the purpose of this study a new term was coined to describe UNITY as embodied in the system theory and the multiplier effect of synergy-energy.

The systems development life cycle is analogous to the system theory widely used in the social science (Imaga, 1993). The phases of the systems development life-cycle include activities that must be completed for any systems development project. In this vein a total quality management programme is conceived of a 'project' which has specific starting point, duration, end point and activities essential to its success. The systems development life cycle (SDLC) activities according to Aluko et al (1997) involve project planning, analysis, design, implementation and support.

RESEARCH METHODOLOGY

This segment of the study concerns itself with the description of the methods and procedures used in carrying out this study. it covers the research design, research area, instrument of data collection, population, sample and sampling techniques, methods of data collection, reliability of instrument, instrument validation, operational measures of variables and method of data analysis.

Research Design

This study adopted the survey research design, where the opinion of the management and staff of Nigeria Breweries were sought on the concepts, theories, benefits and challenges of TQM. The survey design was considered suitable because of its cross-sectional approach that ensures seeking the views of individual employees, supervisors, managers and others who provided relevant statistics. The method used both exploratory and explanatory designs.

Research Area

This study was designed to examine the practice, challenges and benefits of TQM in Nigeria Breweries PLC. Thus, the research is limited to the operational activities of Nigerian Breweries Plc at the headquarters.

Instrument for Data Collection

The primary instrument for the collection of data for this study was a structured questionnaire. The questionnaire was divided into two parts (A and B) while part A was designed to extract the personal data of respondents, part B contained the research statements concerning operational variables that describe the practice, benefits and challenges encountered while implementing TQM. In addition to the use of the questionnaire, textbooks, journals, periodicals, magazines, manuals, reports, circulars, rules and regulations, bulletins and information from the internets were used as secondary sources of data.

Population of the Study

The population of this study comprises of all the staff of Nigerian Breweries Plc.

Sample Size of the Study

The sample size of the study was restricted to the one hundred and thirty-seven (137) staff of Nigerian Breweries, Plc at the headquarters. The sample size was considered adequate because of the heterogeneous nature of respondents who represent various categories of staff in all the departments, cutting through the entire hierarchy in the organization.

Research Variables

The dependent variable according to the theoretical framework for this study is the performance of Nigerian Breweries PLC as affected by the following variables:

i. TQM implementation strategy
ii. TQM success factors
iii. Optimum Quality Efforts
iv. TQM Benefits
v. TQM Barriers

These variables which affect the performance of Nigerian Breweries Plc, are independent variables.

Method of Data Analysis

In analyzing the data obtained in this study, the simple percentage statistical analysis was done. While the formulated hypotheses were validated with the Pearson Product Moment Correlation Co-efficient Analysis.

DATA PRESENTATION AND ANALYSIS

In this segment of the study, all the data that were collected were presented and analyzed.

Data Presentation

The respondents of this study were made up of the supervisors, managers, senior managers and other management staff of Nigerian Breweries Plc at the headquarters. They were one hundred and thirty-seven in number. Accordingly, a total of one hundred and thirty-seven (137) questionnaires were administered, but only one hundred and twenty-five were returned in useable form. The other twelve copies were not properly filled. The distribution of these questionnaires (copies) is shown in table 3.

Respondents' Biometrics

From the total number of one hundred and twenty-five respondents, seventy-six (76 or 60.8%) of them were male, while forty-nine (49 or 39.2%) were female. Of this number, ninety-six (96 or 76.8%) are married, while twenty-nine (29 or 23.2%) were single. We also enquired to know the educational background of the respondents. Our findings revealed that six (6 or 4.8%) of them hold first school leaving certificate as their maximum academic qualification, forty-eight (48 or 38.4%) hold between SSCE and NCE, fifty-five (55 or 44%) are HND/B.Sc. graduates, sixteen (16 or 12%) have M.Sc, MBA and Ph.D degrees.

The respondents were also asked to give information on their length of service and designation in the firm. Our findings showed that sixty-two (62 or 49.6%) of the respondents have worked for between one to ten years in Nigerian Breweries. Forty-five (45 or 36%) have put in between eleven and twenty years, while eighteen have worked between twenty-one and thirty-five years in the Nigerian Breweries. This is an indication that majority of our respondents are highly experienced and are not new to the system. The information we gathered on the designations of our respondents shows that fifty-two (52 or 41.6%) of them are supervisors, fifty-three (53 or 42.4%) are middle level managers while twenty (20 or 16%) of them are in the rank of Senior Manager and Assistant General Manager (AGM).

Practice of Total Quality Management in Nigerian Breweries

We enquired to know whether there exist any significant difference in performance between the pre-total Quality Management and Post Total Quality Management in Nigerian Breweries, Plc. Our findings revealed that ninety-six (96 or 76.8%) of the respondents agreed that there has been significant improvement in the operations of Nigerian Breweries since the introduction of TQM. Twenty-two (22 or 17.6%) disagreed while seven (7 or 5.6%) were indifferent.

In the same vein, respondents were asked to state if TQM has significantly impacted the operational costs of Nigerian Breweries. Seventy-one (71 or 56.8%) stated that the application of TQM has drastically reduced the overall operational cost of Nigerian Breweries. Forty-nine (49 or 39.3%) had contrary opinion, while five (5 or 4%) had no idea. Also, the overall impact of TQM on quality was assessed. One hundred and thirteen of the respondents (113 or 90.4%) agreed that continuous improvement and innovation from TQM practices positively correlate with quality performance, while only twelve (12 or 9.6%) had no idea. No one claimed to disagree absolutely with this claim.

To back up the above claim, seventy-five (75 or 60%) of the respondents said that Nigerian Breweries Management do measure and review the effectiveness of organizational change and share the knowledge that is being obtained. Twenty-one (21 or 16.8%) held contrary view while twenty-nine (29 or 23.2%) had no idea of what role the management was playing in this regard.

Test of Hypotheses

To facilitate the conduct of this study, four hypotheses were formulated in line with the objectives of the study. These hypotheses were tested using the Pearson Product Moment Correlation Coefficient in this segment of the research.

Test of Hypothesis One:

The first hypothesis was stated in its null form as shown below:

Ho: There is no significant impact of TQM on the quality of products of Nigerian Breweries PLC.

Using the Pearson Product Moment Correlation Coefficient Process, Table 4 was developed.

Where r = coefficient of Relationship

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{n(\sum xy^2) - (\sum x)^2\, n(\sum y^2) - (\sum y)^2}}$$

Table 3: Distribution of Questionnaire to Respondents

Department	No. of Respondents
Production	31
Quality Control	17
Reservation/Customer Care	14
Marketing and Sales	15
Purchasing	16
Administration	32
Total	125

Source: Filed Survey, 2014

Table 4.: Statistical Analysis

X	Y	X^2	Y^2	XY
3	96	9	9,216	288
2	22	4	484	44
1	7	1	49	7
∑6	125	14	9,749	339

Source: Statistical Analysis

$$r = \frac{3(339) - 6(125)}{\sqrt{3(14) - (6)^2\ 3(9{,}949) - (125)^2}}$$

$$r = \frac{1017 - 750}{\sqrt{(42 - 36).\ 29{,}247 - 15{,}625}}$$

$$r = \frac{267}{\sqrt{267}\ \sqrt{6 \times 1362^2}}$$

$$r = \frac{267}{81.73^2}$$

$$r = \frac{267}{\sqrt{267}\ \sqrt{286}}$$

$$r = 0.934$$

The value of r (0.934) indicates that the introduction of TQM to the operations of Nigerian Breweries has impacted positively on the quality of its products. This is because 'r' has a strong positive number.

Test of Hypotheses Two

Ho: TQM has not significantly reduced the operating cost of Nigerian Breweries, PLC. (Table 5&6)

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{n(\sum xy^2) - (\sum x)^2\ n(\sum y^2) - (\sum y)^2}}$$

$$r = \frac{3(316) - 6(125)}{\sqrt{3(14) - (6)^2\ 3(7{,}467) - (125)^2}}$$

$$r = \frac{948 - 750}{\sqrt{(42 - 36).\ 22{,}401 - 15{,}625}}$$

$$r = \frac{198}{\sqrt{6 \times 6{,}776}}$$

$$r = \frac{198}{\sqrt{202}}$$

$$r = 0.98$$

A correlation co-efficient of 0.98 shows that there is a positive relationship between TQM principles and the operational expenses of Nigerian Breweries. TQM has drastically reduced the operational expenses of Nigerian Breweries

Test of Hypothesis Three

To further investigate the specific area where TQM has influenced the operations of Nigerian Breweries Plc, the third hypothesis was stated in its Null form thus:

Ho: TQM has no positive relationship with the

Table 5: Total Quality Management (TQM) and Operating Expenses of Nigerian Breweries PLC

Category	Distribution	Percentage
Yes	71	56.8%
No	49	39.2%
No Idea	5	4
	125	100

Source: 2015 Field Study

Table 6: Statistical Analysis

X	Y	X^2	Y^2	XY
3	71	9	5,041	288
2	49	4	2,401	44
1	5	1	25	7
∑6	125	14	7,467	316

Table 7: Statistical Analysis

X	Y	X2	Y2	XY
3	76	9	5,776	228
2	40	4	1,660	80
1	9	1	81	9
∑6	125	14	7,517	317

corporate image of Nigerian Breweries Plc. (Table 7)

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{n(\sum xy^2) - (\sum x)^2\, n(\sum y^2) - (\sum y)^2}}$$

$$r = \frac{3(317) - 6(125)}{\sqrt{3(14) - (6)^2\, 3(7{,}517) - (125)^2}}$$

$$r = \frac{951 - 750}{\sqrt{(42 - 36).\ 22{,}551 - 15{,}625}}$$

$$r = \frac{201}{\sqrt{6 \times 6{,}926}}$$

$$r = \frac{201}{\sqrt{204}}$$

$$r = 0.985$$

Given the result of the correlation co-efficient of 0.985, it clearly shows that there is a significant positive impact of TQM on the corporate image of the organization (Nigerian Breweries PLC).

Test of Hypothesis Four

Hypothesis four relates to the peculiar problems encountered by the Nigerian Breweries Plc in the course of implementing and practicing TQM. The null hypothesis was thus stated as:

Ho: There are no significant problems militating against the effective implementation of TQM in Nigerian Breweries Plc.

The observed responses of respondents on this issue was presented in Table 8&9. While the input for the statistical analysis (Pearson Product Moment Correlation) was extracted from the same table.

Table 8: Observed Frequency

Category	Distribution	Percentage
Yes	96	76.8
No	22	17.6
No Idea	7	7
Total	125	339

Source: Field Survey, 2015

Table 9: Statistical Analysis

X	Y	X^2	Y^2	XY
3	96	9	9,216	288
2	22	4	484	44
1	7	1	49	7
∑6	125	14	9,749	339

Source: Statistical Analysis

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{n(\sum xy^2) - (\sum x)^2\, n(\sum y^2) - (\sum y)^2}}$$

$$r = \frac{3(339) - 6(125)}{\sqrt{3(14) - (6)^2\, 3(9{,}749) - (125)^2}}$$

$$r = \frac{267}{\sqrt{286}}$$

$$r = 0.934$$

The Pearson product Moment Correlation Coefficient of 0.934 indicates the existence of problems and challenges at the inception and at the later part of implementing TQM in Nigerian Breweries. When the researcher probes further on the nature of the challenges, the following were mentioned.

- TQM is very expensive and difficult to implement.
- It requires the support of the senior management staff in terms of monitoring, mentoring, and encouraging the new culture
- Lack of companywide definition of TQM often makes workers to address different issues in the name of TQM

DISCUSSION OF FINDINGS

In the course of this study, we discovered that the successful implementation of TQM in Nigerian Breweries had significantly reduced their operating manufacturing costs. The study reveals that waste was significantly reduced in Nigerian Breweries Plc. This is in line with the findings of Oakland (2005), who said that the application of TQM in Japanese firms has almost eliminated all forms of wastes thereby making organizational processes and other activities less costly to manage.

His conclusion was that "you do not need many inspectors before waste goes down, inventory goes down, (Hendricks and Singha, 1997). The main implication of this is that when everyone in an organization works harmoniously toward satisfying the needs of the customers, the goals and objectives of the entire organization are achieved at the least possible costs. It was also discovered that there exist a significant relationship between TQM and improved quality of products. This is in line with the postulations of Esin and Halah (2014) who states that TQM is always associated with improved quality. This according to him, is because TQM is always practiced with total commitment, resilience, patience and perseverance. It is also associated to the fact that always Stakeholders are encouraged to give feedback on the quality/performance of products of the company and inputs are acted upon.

The study reveals also that TQM is a booster of corporate image. This implies that when a high quality product or service is associated with a firm its image or goodwill is enhanced. This agrees with the findings of Mark (2014) who suggests that a near perfect correlation exist between quality culture and the goodwill of a firm.

Significance of Findings

The reasons for the TQM implantations may guide managers on how to motivate employees in the practice of this application. It will also improve the image of the firm and its overall performance. Discovering the barriers to TQM can be used by the forms who are in the planning

or early stages of TQM practices to improve the awareness and understanding of its principles. They can also be used by the forms who have already used TQM for some time to assess the progress and to improve their organisation.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The study was designed to examine the impact of TQM on the performance of manufacturing firms in Nigeria; with particular reference to Nigerian Breweries Plc. The findings of the study clearly shows that TQM has positive correlation with the overall performance of Nigerian Breweries Plc and specifically in terms of cost reduction, customer services delivery, employees satisfaction; quality of products, and its corporate image. We therefore conclude that a careful implementation of TQM in Nigerian manufacturing firms will drastically reduce waste and promote innovation and creativity.

In line with the objectives and findings of this study, we suggest the under-listed recommendations:

1. The principles of total quality management enunciated by Sherwhart, Juran, Deming, Feigenbaum, and others should be internalized and practicalized by Nigerian manufacturing firms who are pursuing innovation, the TQM way. This is because there is no shortcut to success. Indigenous manufacturing firms are encouraged to embrace TQM principles if they must succeed and thrive in this era of global recession.
2. Total quality management is neither a one-line antidote to organization's quality or customer satisfaction problems nor a fad that is here today, gone tomorrow. Organizations opting for TQM should carefully scrutinize themselves to ensure that they have the financial resources, moral will power and the top management support that are key ingredients for the success of TQM programme.
3. Total Quality Management should not be viewed as an end in itself but rather a means to an end. Management should bear in mind that the bottom line of their organization's existence is profit and unless quality improvement programme are economical and beneficial to both internal and external stakeholders, such venture might amount to "drain pipes" on organizational resources. The company must satisfy customers today and survive to satisfy them in the future.
4. Government should make regulations that will promote, sustain and uphold quality practice in Nigerian manufacturing firms.
5. Top management should serve as role models to their employees in issues relating to quality. Quality culture should cascade down from the senior management team. Part of the supportive role of senior management in the practice of TQM should be monitoring, mentoring and encouraging the quality culture.

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