TOTAL QUALITY MANAGEMENT AND OPERATIONAL PERFORMANCE IN THE BREWERY INDUSTRY IN EDO STATE

Gabriel, C. K.
Department of Business Administration
Benson Idahosa University, Benin City, Nigeria.
gchika@gmail.com

ADEDOYIN, S. A
Department of Business Administration
Benson Idahosa University, Benin City, Nigeria
sadedoyin@biu.edu.ng

Abolarinwa S. I. (Correspondence author)
Department of Management,
University of Nigeria Nsukka, Nigeria.
walesam04@gmail.com

Abstract

Across various industries and sectors, the strategic importance of total quality management in enhancing operational efficiency has been widely emphasized. The study examined the role of TQM in optimizing operational performance within the brewery industry in Edo State. Specifically, three key dimensions of TQM - customer focus, continuous improvement, and process management - were highlighted for their effect on operational efficiency. Corresponding hypotheses were formulated for testing. The study adopted a cross-sectional research design, utilizing a survey to collect data. The study population comprised employees of Nigerian Brewery and Guinness Nigeria PLC in Edo State, totaling 1,978 staff as of November 2023. A sample size of 332 was derived using the Yamane sampling size determination formula. The study utilized stratified and convenience sampling techniques. The proportional allocation method was used to distribute the sample size across the strata in the brewery organizations. The data was collected using a well-structured research instrument designed on a 5-point Likert scale to elicit responses concerning the studied variables. The hypotheses were tested using multiple regression analysis at 5% level of significance. The findings of the study showed that the three dimensions of TQM examined had significant positive effect on operational performance of the brewery industry in Edo State. The study concluded that customer focus, continual improvement, and process management significantly influenced operational performance, and recommended amongst other things that the breweries should adopt structured process management frameworks focusing on continual improvement, efficiency, and quality control to enhance operational performance.

Keywords: total quality management, operational performance, brewery industry, customer focus.

Introduction

Total Quality Management (TQM) has become a pivotal management philosophy in modern organizations and useful for significantly enhancing

operational efficiency and competitiveness (Kungu, 2017). As a strategic approach, it fosters a long-term commitment to continuous quality improvement, enabling firms to meet customer expectations at minimal cost while maintaining sustainable business practices (Teryima, Fabrm, John, & Philip, 2016). From the literature, organizations that integrate TQM principles tend to outperform those that do not (Yusuf, Gunasekaran, & Guo, 2007; Adudu, Asenge, & Torough, 2020). Some core dimensions of TQM, as highlighted by ISO 176, include customer focus, top management support, continuous improvement, and process management, all of which contribute to enhanced operational efficiency and competitiveness (Shulammite, 2016). Globally, the adoption and implementation of the TQM philosophy and practices has gained prominence; and studies (Chukwu, Adeghe, & Anyasi, 2016; Kungu, 2017; Dahlgaard, Reyes, Chen, & Dahlgaard-Park, 2019; Adudu, Asenge, & Torough, 2020) have underscored its benefits to organizations. The extent of its implementation within specific industries and regions however remains an area of ongoing investigation.

Previous studies like (Shulammite, 2016; Kungu, 2017; Abuo & Ezeokonkwo, 2018), have examined the impact of TQM across various contexts there remains limited research on its application in the brewery industry. While many manufacturing firms have integrated TQM dimensions into their operations (Kungu, 2017); there is insufficient evidence regarding the level of TQM adoption in breweries within the area of study as existing studies on breweries have primarily focused on different geographic areas and industrial settings (Chukwu et al., 2016; Teryima et al., 2016; Kungu, 2017). This highlights a gap in understanding how key TQM dimensions - such as process management, customer focus, top and continuous improvement - are applied in this sector. Furthermore there are concern regarding the brewery industry’s approach to quality management, as reports indicate inconsistencies in supply and distribution, employee disengagement, and a lack of cross-functional collaboration (Shulammite, 2016). Customer dissatisfaction too, due to frequent product shortages further raises questions about the industry's commitment to customer focus and continuous improvement (Chukwu et al., 2016). Given these challenges, it is essential to assess TQM practices within the breweries and identify areas for improvement so as to enhance operational efficiency and service quality. This study therefore, investigated the effect of TQM implementation on the operational performance of the brewery industry in Edo State, Nigeria. Specifically, it sought to determine the extent to which breweries in Edo State have adopted TQM dimensions and how these practices influence their efficiency, customer satisfaction, and overall competitiveness. The study was executed by examining key TQM components such as customer

focus, continuous improvement, and process management. The research provides insights into the effectiveness of TQM in the industry and offer recommendations for enhancing quality management practices within the sector.

Literature Review

Understanding Operational Performance

Voss, Ahlstrom, and Blackmon (2012) describe operational performance as the quantifiable components of organizational processes, encompassing adaptability, responsiveness, and value creation. It is the measurable aspects of an organization's operations, including stock movement, process cycle time, and overall efficiency (Chesaro, 2016); and involves elements such as production dependability, defect rates, cycle time, cost reduction, and inventory management (Wei, 2014). Effective operational performance aligns the different units of the organization with the broader business objectives (Tibeibho et al., 2021; Voss et al., 2012). Operational performance metrics assess the efficiency of an organization's procedures in achieving set objectives (Hazirah & Hadli, 2017). Birech (2011) further outlines various performance metrics, including productivity, quality, inventory control, lead-time management, preventive maintenance, and adherence to schedules. Specific measures include cost of quality, variance analysis, safety metrics, and profit contribution (Chesaro, 2016). Operational performance ultimately reflects an organization’s success in executing its strategic objectives.

Total Quality Management (TQM)

Total Quality Management (TQM) is a comprehensive approach focused on continuous quality improvement across all organizational functions (Shankar, 2012). It requires a long-term commitment involving active participation at all levels (Jones, 2011); and aims to exceed customer expectations by embedding quality improvement into the organization's culture (Weihrich & Koontz, 2005). TQM emphasizes continuous adaptation to evolving customer needs, considering socio-economic and technological factors (Ndiokho, 2012). It fosters a culture of learning and process enhancement (Abuo & Ezeokonkwo, 2018) and promotes collaboration across functional areas to achieve success (Chukwu et al., 2016). The core principle of TQM is the relentless pursuit of process improvement to enhance operational performance (Ndiokho, 2012), ensuring that quality enhancement is an ongoing effort rather than a one-time initiative.

Theoretical Review

This study is established on the following two key theories:

i) **Edward Deming's Theory of TQM**,
Deming's TQM theory focuses on improving efficiency and competitiveness through quality enhancement. His principles—continuous improvement, leadership development, and collaboration—have shaped modern quality management. The approach supports systematic quality improvement, cost reduction, and productivity while emphasizing long-term planning. However, it faces criticism for rigidity, complexity, and limited adaptability to globalization and technology. Despite these challenges, Deming's ideas significantly impacted TQM, especially in Japan's manufacturing and service industries, driving quality and efficiency improvements.

ii) **The European Foundation for Quality Management (EFQM) model**
The EFQM model enhances traditional TQM frameworks by adding flexibility and adaptability while maintaining a focus on quality improvement. It takes a holistic approach, incorporating leadership, people management, customer focus, and social responsibility. The model supports continuous learning and benchmarking, making it suitable for diverse industries. However, frequent updates are needed to stay relevant, and its less structured nature can lead to varying implementation effectiveness. Despite this, its adaptability and responsiveness make it a valuable tool for sustainable quality management.

Empirical Review

Qadeer and Ahmad (2014) investigated the relationship between total quality management (TQM) dimensions and organizational performance in Pakistan's textile industry. Using a survey research design with a sample of 270 managers, data analysis through multiple linear regression revealed that top management support did not significantly predict performance. Similarly, Jabeen et al. (2015) examined the impact of TQM dimensions on the performance of small and medium enterprises (SMEs) in Punjab, Pakistan. A cross-sectional research design was used, with a sample of 380 SMEs determined through Krejcie and Morgan's (1970) sampling technique. Structural equation modeling (SEM) analysis indicated that management leadership had a significant effect on SME performance.

Sutrisno and Timotius (2019) explored the effect of soft and hard TQM dimensions on the performance of Indonesia's food production industry. A survey research design was employed with a population of 136 SMEs, and findings from SEM analysis showed that both soft (customer focus, training, process management) and hard (statistical process control, quality tools) TQM significantly enhanced organizational performance. In contrast, Ravisha and Pakkerappa (2017) assessed the impact of employee empowerment on performance in Karnataka's steel industry. Using an observational research method with 43 respondents, data analyzed through Pearson's Chi-Square technique showed no significant relationship between empowerment and employee performance.

Ibua (2017) examined the influence of employee empowerment on performance in Kenya's public universities. A descriptive research design was used with a sample size of 1,011 employees, and data analysis using linear regression showed that employee empowerment had a positive and significant effect on performance. Similarly, Amah and Ahiauzu (2013) explored the relationship between employee involvement and organizational effectiveness in the banking sector. Using a survey design with a sample of 320 managers, correlation analysis revealed that employee involvement positively impacted profitability, productivity, and market share.

Abuo and Ezeokonkwo (2018) examined factors affecting TQM implementation in Nigeria's construction industry. A descriptive survey with 455 respondents was conducted, and factor analysis revealed that management support (leadership) was the most influential factor, while teamwork was the least significant. Finally, Worlu and Obi (2019) investigated the relationship between TQM and organizational performance, using customer satisfaction as a proxy for performance. A case study design was employed with 325 respondents from Cway Water Group, and regression analysis confirmed a significant positive relationship between TQM and customer satisfaction.

The link between customer focus and operational performance

Customer focus and satisfaction has become a widely researched variable in quality management (Amah & Ahiazu, 2013; Joshi, 2019). It encompasses the emotional responses customers have toward a product, shaped by their expectations and actual consumption experiences. Satisfaction is determined by the alignment between perceived and expected product performance (Akhtar et al., 2016). Customer focus is a critical dimension of TQM, emphasizing the need to understand and meet customer expectations. Worlu

and Obi (2019) found that customer satisfaction is positively associated with TQM practices, reinforcing the notion that businesses focusing on customers achieve better market positioning. Similarly, Sutrisno and Timotius (2019) highlighted customer focus as a major determinant of operational performance.

The link between continual improvement and operational performance

Continual improvement involves systematic management processes that include measurement, analysis, and enhancement of operations (Ropret, 2012). It is based on the principle that all levels of an organization should strive for ongoing quality enhancements (Tibeibaho et al., 2021). This approach ensures that every member of the organization adheres to high standards of operational excellence. Continual improvement involves systematic efforts to enhance processes, reduce waste, and increase efficiency. Li, Andersen, and Harrison (2003) and Brennan et al. (2017) report that continual improvement positively impacts organizational performance. However, achieving desired outcomes requires strategic alignment. Brennan et al. (2017) emphasize that continual improvement is an organizational effort rather than a team-specific initiative. Therefore, organizations must provide adequate training on the theories and techniques of quality improvement to optimize performance. Sutrisno and Timotius (2019) found that continual improvement significantly influenced performance, while Abuo and Ezeokonkwo (2018) emphasized the importance of monitoring mechanisms for sustaining quality.

The link between process management and operational performance

Process management refers to the alignment of processes with an organization's strategic goals; the design and implementation of process architectures, the establishment of process measurement systems aligned with organizational objectives, and the education and organization of managers to effectively oversee these processes (Teryima et al., 2016). Process management encompasses various automation efforts, such as workflow management systems, process flow optimization, automated process measurements, and managerial training to enhance process efficiency and workflow organization. Additionally, process management centralizes data, making information retrieval more efficient throughout business operations. Strong process control mechanisms allow for clear identification of work instructions and process clarifications, enabling quick resolution of production-related issues at any stage of the process (Garba, 2020). Ensuring high level process management from raw material procurement to the

distribution of finished products strengthens an organization's operational effectiveness. The central principle of this approach is the seamless coordination of "material flow" to enhance organizational performance.

Materials and Methods

This study employed a cross-sectional research design. The design facilitated effective data collection. The study utilized the primary source of data. The study population comprised employees of the two sampled breweries within Edo State - Nigerian Brewery and Guinness Nigeria PLC - totaling 1,978 staff as of November 2023. The study utilized a sample size of 332 respondents which was derived using the Yamane (1968) sampling size determination formula. The study further employed stratified and convenience sampling techniques. The proportional allocation method (Pandey & Verma, 2008) was used to distribute the sample size across the respective stratum in the brewery organizations. A research instrument structured in a 5-point Likert scale was used ranging from: 1 - Strongly Disagree, 2 - Disagree, 3 - Undecided, 4 - Agree, 5 - Strongly Agree. The questionnaire was validated using content and face validity by the experts in management studies. Feedback from these experts facilitated necessary modifications. A pilot survey was conducted with 20 employees in the brewery industry to test the reliability of the instrument. Cronbach's Alpha reliability test was used to measure internal consistency, with values exceeding 0.70 considered acceptable for reliability. This ensured that the research instrument was both valid and reliable for data collection.

Table 1: Reliability Values

S/N	Variables	Items	alpha values
1	Customer focus	CUF_i - CUF_5	0.829
2	Continuous Improvement	CTI_i - CTI_5	0.823
3	Process Management	PMG_i - PMG_5	0.844
4	Operational Performance	OPF_i – OPF_5	0.701

Source: Authors Fieldwork (2023)

Model Specification

A multiple regression model was employed to represent the constructs used in this study specified as Equation.1. This model was designed to explain variations in operational performance resulting from changes in total quality management (TQM) dimensions. It assumes a linear relationship between the dependent variable (operational performance) and the independent variables (TQM dimensions.

The model specification is given as follows:

OPF = f(CUF, CTI, PMT) ……(1)

$$OPF = \alpha + \beta_1 CUF_i + \beta_2 CTI_i + \beta_3 PMG_i + \varepsilon_i \ldots\ldots\ldots\ldots (2)$$

Where:

α_0	=	Parametric constant
OPF	=	Operational performance
CUF	=	Customer focus
CTI	=	Continual improvement
PMT	=	Process management
ε_i	=	Error term

Statement of Hypotheses

The following hypotheses were tested in this study:

H1: Customer focus has a positive and significant effect on operational performance.

H2: Continual improvement has a significant positive influence on operational performance.

H3: Process management has a significant positive effect on operational performance.

Results and Discussion

The hypotheses stated above were tested using multiple regression analysis. The results are as presented:

Table 2: Summarized regression coefficients result.

Model			*t-stat*	*p-value*
	Coefficients B	*Std. Error*		
(Constant)	3.061	1.010	3.032	0.0127
CUF	.399	.038	10.439	0.0024
CTI	.096	.033	2.926	0.0038
PMT	.370	.047	7.899	0.0033
CUF f-stat	8.543			
f-sig	0.000[b]			
CTI f-stat	7.560			
f-sig	0.000[b]			
PMT f-stat	9.117			
f-sig	0.000[b]			
f-stat	2.498			
f- sig	0.003[b]			

R-value	0.758[a]			
R- Squared	0.574			

Source: Authors fieldwork (2023)

Interpretation of Results

The regression analysis presented in Table 2 indicates that the model is of high quality, with total quality dimensions adequately explaining variations in firms' operational efficiency. The R-Square value of 0.574 suggests that approximately 57.4% of the variation in operational performance is accounted for by the independent variables. Additionally, the Durbin-Watson statistic of 2.402 indicates no significant concern regarding autocorrelation of residuals, ensuring the reliability of the model. Furthermore, the F-statistic is significant at the 5% level, confirming the overall significance of the total quality management (TQM) dimensions in explaining operational performance. However, at the individual variable level, the statistical significance of the effect varies.

Discussion of findings

With respect to hypothesis one, the results in Table 2 indicate that customer focus significantly improves operational performance in the Edo State brewery industry. This aligns with previous research, such as Qadeer, Mehmood, and Ahmad (2014), who identified customer focus as a key total quality management dimension that enhances service quality and satisfaction. Similarly, Worlu and Obi (2019) found that customer-centric TQM practices foster trust, loyalty, and competitive advantage. Studies like Ronda (2010); and Sutrisno and Timotius (2019) further confirm that prioritizing customer satisfaction boosts operational efficiency and market positioning. Other scholars however argue that customer focus alone is insufficient for sustained success**.** Ylinen and Gullkvist (2014) emphasize the need for innovation, process efficiency, and leadership support, while Shulammite (2016) highlights the necessity of integrating customer focus with broader quality management initiatives. Overall, breweries in Edo State that prioritize customer needs, enhance service delivery, and adapt to market dynamics experience improved productivity, quality control, and competitiveness. To maximize benefits, aligning customer focus with innovation and comprehensive quality management strategies is essential (Krajcsák, 2019; Enyinna, 2024).

Concerning hypothesis two, the results in Table 2 confirm that continual improvement significantly enhances operational performance in the sampled brewery industries. The regression coefficient t-value (2.926), and p-value

(0.004) indicate a strong and statistically significant relationship. Thus, the null hypothesis is rejected affirming that continual improvement contributes to operational efficiency. This finding aligns with prior research**.** Ropret (2012) emphasized continual improvement as a key driver of business excellence, while Tibeibaho, Nkolo, and Henriksson (2021) found that structured quality improvement enhances decision-making and operational outcomes. However, some studies highlight conditional factors. Ronda (2010) argued that the impact of continual improvement depends on organizational culture and employee engagement. Similarly, Teryima et al. (2016) found that Nigerian breweries benefited from TQM practices, but only when continual improvement was integrated with broader quality strategies. Overall, breweries that actively implement continual improvement achieve higher productivity, product consistency, and market competitiveness**.** However, success depends on strong organizational culture, employee involvement, and alignment with quality management frameworks**.**

Regarding hypothesis three, the results in Table 2 confirm that process management has a significant positive effect on operational performance in the Edo State brewery industry. The regression coefficient - t-value (7.899), and p-value (0.000) indicate a strong and statistically valid relationship, leading to the rejection of the null hypothesis. This finding aligns with prior studies. Sutrisno and Timotius (2019) found a strong link between process management and operational success in food production SMEs. Similarly, Teryima et al. (2016) concluded that effective process management in Nigerian breweries enhances operational excellence by streamlining workflows, improving quality control, and reducing waste**.** Overall, strong process management optimizes resource use, boosts efficiency, and fosters continuous improvement. Breweries that implement these practices are likely to achieve higher productivity and long-term organizational benefits**.**

Conclusion and Recommendations / Policy Implications

This study explored the effect of total quality management (TQM) practices on operational performance in Edo State's brewery industry using dimensions such as customer focus continual improvement, and process management. The findings confirmed that customer focus, continual improvement, and process management significantly enhance efficiency, reduce waste, and improve operational performance**.** These results align with previous research, emphasizing process optimization, continuous improvement, and customer alignment as key drivers of success**.** Given the brewery industry's evolving

landscape, these insights provide valuable strategies for the breweries to enhance efficiency and maintain a competitive edge**.**

Recommendations:

1. The breweries should adopt structured process management frameworks that emphasize customer focus, continual efficiency improvement, quality control, and waste reduction.
2. Breweries should implement lean manufacturing practices to streamline production processes and utilize data-driven decision-making to improve efficiency and performance outcomes.
3. The breweries should prioritize customer engagement and establish feedback mechanisms to better understand and meet consumer needs. Also, investments in product innovation to remain competitive and in alignment with evolving market demands.
4. The regulatory agencies should reinforce industry standards that emphasize product quality and customer satisfaction. Initiatives promoting continuous improvement aiming to facilitate operational efficiency, product quality, and customer satisfaction should be encouraged.

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