

X-RAYING TECHNOLOGICAL INNOVATION AND SUSTAINABILITY OF BREWING FIRMS IN THE SOUTH EAST NIGERIA

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ABSTRACT

The environment plays a huge role and impact on the growth and survival of businesses that exist within it. It is therefore expected that businesses must at least for the sake of the future, take conscious steps to preserve the environment. Firms leverage on advancement and innovations in technology to remain relevant in the business. This research work examined technological innovations with regards to sustainability of brewing firms in the South East Nigeria. The specific objective of the study was to determine the effect of product innovation on customer satisfaction of brewing firms in South East Nigeria. The use of questionnaire was deployed to obtain data from a total of 170 workers selected from the three brewing companies operating in the South East Nigeria. The data collected from the respondents was tabulated and analyzed using descriptive statistics of percentage table of mean and standard deviation while the hypothesis was tested using Pearson Product Moment Correlation aided by SPSS. The findings revealed a positive impact of product innovation on customer satisfaction and therefore concluded that technological innovation is very vital for sustainability in brewing firms in the South East Nigeria.

KEYWORDS: Technology, Innovation, Sustainability, Product Quality, Product Reliability, Customer Satisfaction.

1. INTRODUCTION/ BACKGROUND OF THE STUDY

The flow in business activities and the overall success in performance of business organizations cannot be possible without placing a huge premium on the environments in which they operate. Naturally, businesses are influenced and determined by a set of intervening variables or factors. These factors to which businesses and their operators must continuously watch and adjust to, constitutes the business environment. The environment of business has and is still growing in complexity and this has made business organizations especially manufacturing firms to lay emphasis on their processes, products and its value chain management in order to achieve a sustainable development and competitive advantage in the market. Technology and technological advancement is a complex aspect of business environment. The capability and capacity of manufacturing firms to function is dependent on their commitment and appreciation of the innovations that has and is taking place in technology.

The word technology is often associated with machines and other equipment used in production and how these devices are combined to bring about a definite product or item of value. According to Wikipedia.com, technology is broadly defined as the entities, both material and immaterial, created by the application of mental and physical effort in order to achieve some value. One can extrapolate from this definition that technology refers to tools and machines that may be used to solve real-world problems. Also, technology is seen to mean the sum total of knowledge or ways of doing things and includes inventions, techniques and the vast store of organized knowledge about everything from aerodynamics to zoology (Kontz et al, 1981). In the views of Perrow (1965), technology is defined as a technique or complex of techniques employed to alter the status quo of materials (human or non-human, mental or physical) in an anticipated manner. It is imperative therefore to infer that having solid technologies in place in organizations would lead to increased productivity or improved performance when combined effectively with other resources like human resources (Dauda & Akingbade, 2011). Unarguably, technology affects the way products and services are designed, developed and distributed. Technology affects product quality and price. However, Burgelman, Maidique and Wheelwright (1996) explained that a firm's strategy is expressed in the products and services it brings to the market which depended on the technology. Therefore, once technology is mentioned, the means of production is noted. Kamzi (2003) sees technology as consisting of factors that are related to knowledge applied and machine used in the production of goods and

services which have an impact on the business of the organization. The state of technology in any organization has a significant influence on the quality and quantity of production of its goods or services. This entails that organizations have to continually monitor, manage and cope with technological changes and advancement with a view of innovation.

The responsiveness of management to technological innovation is a determining factor with regards to the effectiveness of the firm's performance and effectiveness. Burgelman, Maidique and Wheelwright (1996) pointed out in Porter (1983) that technology is among the most prominent factors that determine the rules of competition. A firm that does not follow up with the changes in production methods and techniques may be forced out of the market. Primitive or out-dated technologies may not be efficient as new discoveries. The results of inefficiency in the use of out-dated technology may include: low quality products, high prices of products, less quantities of products in the production runs, among others.

Technological changes include changes in raw materials and the equipment used for production. Such changing technology offers opportunities for improving objectives attainment and where disregarded, can threaten the existence of the firm (Glueck and Jauch, 1972). Committed organizations regularly bother and spend a fortune on creating innovations in technology as a sure way to unlock the market forces or conquer competition.

Technological innovation affects the product or service life cycle. It is possible through investment in research and development to extend the life of a product that is approaching declining stage through technological innovation while on the other hand organization should take cognizance of the fact that the development of a new product may render some closely related product obsolete. It is therefore necessary for organization to constantly scan the technological environment to determine what technology innovation will mean to existing products. However, the impact of technological innovation will vary from industry to industry because some sectors of the economy are technologically more volatile than others.

This paper therefore investigates the effect of technological innovations with a view to determine the extent it has helped the performance and sustainability of manufacturing firms in the Nigeria economy.

Statement of the Problem

The manufacturing sector is noted as one of the engine of growth for employment, a creator of wealth and the threshold for sustainable development (Nwala, 2016). The manufacturing sector is a major constituent of the non-oil sector and is expected to play a major and leading role in building and strengthening the nation's GDP (Nwosu, 2017). Unfortunately, it seems to be facing more challenges than any other sector in Nigeria. The inability of the sector to cope with challenges is reflected in its abysmal performance over the years.

Some of the problems that have bedeviled this very important sector include but not limited to low and fluctuating capacity utilization, inability to access modern technology (low-tech investment), irregular production schedules, stock outs and inability to meet market expectations, inconsistent product quality and reliability, poor materials management, low inventory turnover ratio and high rate of mortality, etc. The high rate of mortality in the sector clearly highlights the inability of the sector to cope with its challenges especially technological challenges. All these problems affect the performance of the brewing firms and by extension, the level of satisfaction and commitment of their customers.

In the review of sector's contributions to GDP as published in the third quarter of 2018 by National Bureau of Statistics (NBS, 2019), the contribution of the manufacturing sector to the nation's GDP is a paltry 8.84 percent. The manufacturers association of Nigeria (MAN) reaffirmed this figure and pledged ensuring that this figure is increased to at least 15 percent in the year 2019 (Leadership newspaper, 19th Feb, 2019).

For a country like Nigeria with huge consumption power, and an estimated population and market size of approximately 200 million people (UN, April 2019); and or 198 million people (Eze, April 2018), to have a manufacturing sector whose capacity utilization revolves between 35% and 40%; with dwindling contribution to the Gross Domestic Product (GDP) and poor growth rate, the challenge of sustainability of business becomes quite enormous.

It is instructive to point out here that one of the major problems with the Nigerian manufacturing sector is that it is a low-tech sector. Investment in modernization and upgrading of production technology in the sector have been minimal implying that most firms operating in the sector are most likely non recent production technology.

Product innovation and sustainability is the key element that would close the doors of these challenges and keep the brewing firms active and alive to the demands of their markets.

In view of the above, the problem of this study is that inconsistency in product quality of brewing firms affects the product reliability leading to poor satisfaction of customers and more reliance on foreign products of brewing firms. Foreign products such as Heineken, Budweiser, etc have dominated the beer market with very stable, high quality and reliable products while the local products such as Hero, Star, Golden Guinea are struggling to survive. The synopsis of the problem above informed and prompted the researcher to undertake the study on technological innovation and sustainability of brewing firms in the South East Nigeria.

Objective of the Study

The major objective of this study is to examine the effect of technological innovation on the sustainability of brewing firms in the South East Nigeria. The specific objective is:

1. To determine the effect of product innovation on customer satisfaction of brewing firms in South East Nigeria.

For the purpose of this work, **product innovation** is decomposed into new product designs, improved product variety, product acceptability, improved product quality, and product reliability. Also, **customer satisfaction** is decomposed into price affordability (low price offerings), delivery and support services, customer loyalty to the firm's product (product addiction), and brand preference/retention. These variables/elements are some of the determinants and indicators of product innovation and customer satisfaction.

Research Question

The research question is:

1. What is the effect of product innovation on customer satisfaction of brewing firms in the South East Nigeria?

Hypothesis

In order to achieve the above objective, the researcher formulated the following hypothesis:

H₀₁: Product innovation has no significant effect on customer satisfaction of brewing firms in the South East Nigeria.

Significance of the Study

The outcome and findings of this study will provide reasonable assistance to the brewing firms in the formulation of policies that will help channel more attention to ensuring the offering of high quality and reliable products. This is a sure way of promoting the company's image, increase in market share and retention of customer loyalty. Both students, independent researchers, and other corporate entities that may have need for referrals will find the work very useful with its contributions to the existing body of knowledge on the topic under study.

Scope of the Study

The study has its focus on technological innovations and sustainability of brewing firms in the South East Nigeria. The South East region is made up of the following states: Abia, Anambra, Ebonyi, Enugu and Imo. Because the manufacturing sector is quite big and covers a wide spectrum, it was further narrowed to the brewing industry. The specific focus of the study therefore is on the beer brewing and manufacturing companies in the south eastern region. They are: (1) Intafact Beverages Limited – SABMiller located at Onitsha in Anambra State. The make Hero Larger Beer, Castle Milk Stout, and Grand Malt.

(2) Nigerian Breweries at 9th Mile in Enugu and Awo-Omama in Imo State. The maker of Star Larger, Gulder, Legend Stout, Heineken, Life, Ace Passion, Star Lite, Turbo King Stout, Goldberge Larger, Star Raddler, Maltina, Fayrouz, Hi-Malt, Climax Energy drink, etc.

(3). Golden Guinea Plc located at Ubakala in Umuahia, Abia State. The make Golden Guinea Beer, Bergedorf Beer, Bergedorf Malta.

Limitations of the Study

At first, some managers of these firms were skeptical about my sincerity while some saw me as an espionage or a mole and were a bit withdrawn to divulge some information to me. This I believed affected the volume of information made available to me and invariably limited the study to the extent of information released.

2. REVIEW OF RELATED LITERATURE

Concept of innovation:

In its modern parlance, innovation stands for new idea, creative thoughts, and new imaginations in the form of device or method. It is often also seen as the application of better solutions that meet new requirements,

unarticulated needs, or existing market needs. Drucker (1985) avers that innovation is a change that creates a new dimension of performance. However, innovation has been captured in a more elaborate and succinct manner by Crossan and Apaydin (2014) in Organization for Economic Co-operation and Development manual to mean “production or adoption, assimilation, and exploitation of a value-added novelty in economic and social sphere; renewal and enlargement of products, services, and markets; development of new methods of production; and the establishment of new management systems. It is therefore both a process and an outcome (product). Product and process innovation according to Polder et al (2010) only lead to higher productivity when performed in combination with organizational innovation.

Again, Mazzaferro (2017); and Edison, Ali, & Torko (2014) agrees that innovation dwells on original invention and creative use having defined it as the generation, admission and realization of new ideas, products, services and processes. They further identified two major dimensions of innovation to be degree of novelty/patent, which indicates whether an innovation is new to the firm, new to the market, new to the industry, or new to the world; and kind innovation which shows whether it is process or product-service system innovation. It is inconsideration of this dimensions that the need to draw a distinction between creativity and innovation becomes absolutely inevitable. As opined by Hughes, Lee, Tian, Newman & Lagood (2018), workplace creativity concerns the cognitive and behavioral processes applied when attempting to generate novel ideas while workplace innovation concerns the processes applied when attempting to implement new ideas. In specific terms therefore, innovation involves some combination of problem/opportunity identification, the introduction, adoption or modification of new ideas germane to organizational needs, the promotion of these ideas, and the practical implementation of these ideas.

Technological innovation appears narrower in its real sense and reflects the business consideration of improving business value by working on technological aspects of the products or services. However, it is very fundamental to note that in a vast majority of products and services, there is not one unique technology at the heart of the system. Rather, it is a combination, integration and interaction of different technologies that make the product or service successful. Technological innovation comprises activities that contribute to the research, development and design of new products, services or techniques, or to improving existing products, and generates new technological knowledge. It can either alter or strengthen the existing structure of method that is in practice in the organization with regards to product design, quality, processes, markets served, etc.

As opined by Asad (2019), innovation has three categories-- product innovation, process innovation and business model innovation. A brief summary of each category is presented below.

Product Innovation

This aspect is when the focus and attention of an organization and her members is on their product offering. Product innovation can come in three major ways: 1) the development of an entirely new product. 2) An improvement of the performance of the existing product. 3) Adding a new feature to an existing product. It is important to infer that the drivers of product innovation might be technological advancements, changes in customer requirements, or outdated product design. Innovation on any product must be visible to the customers and should bring about an increase in the demand for the product.

Practical Benefits of Innovation

Innovation technology is at the heart of global business integration and the benefits that it offers according to Joseph (2016); Madu (2018); and Ighelebah (2018), include the following:

- Improved productivity
- Reduced cost
- Increased competitiveness
- Improved brand recognition
- New partnership and relationships
- Increased turnover and improved profitability.

Obviously, innovation enables problem solving and provides creative insight that allows businesses to look at things from a different perspective, regardless of whether it is developing a new product, refreshing strategy or finding an original way to stay ahead of competition.

Of note also is the fact that reluctance or inability of some firms to improve on their products or services may make the firm not to compete, diversify or operate maximally. Businesses that fail to innovate run the risk of:

- Losing market share to competitors
- Falling productivity and efficiency
- Losing key staff

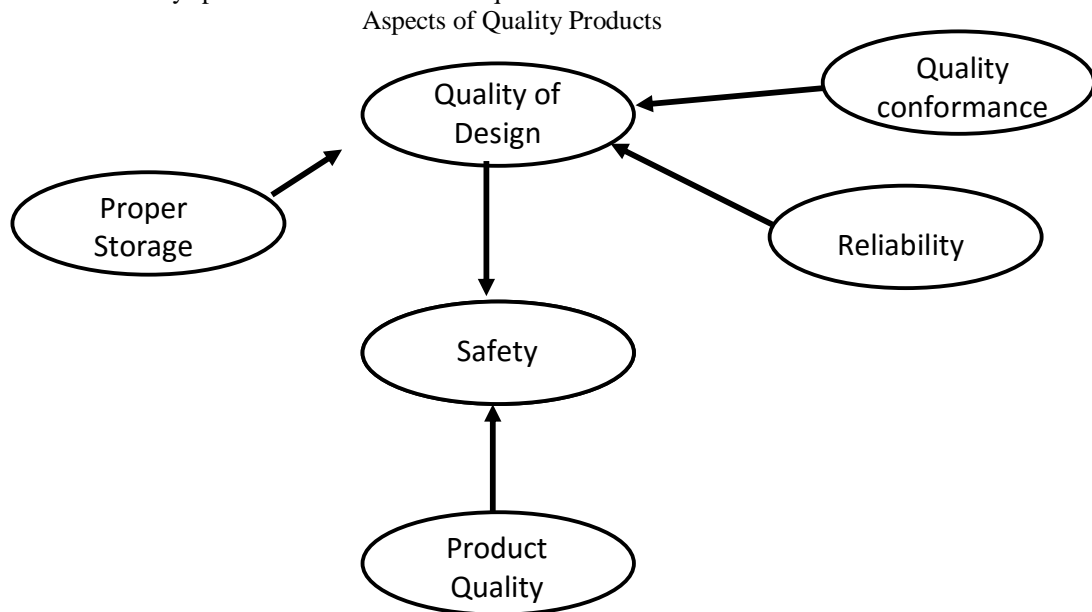
- Reduced margins and profits
- Going out of business

Innovation can be precarious but the potential benefits can be vital to the continuing success of the business.

PRODUCT QUALITY

Product quality in a simple term refers to the collection of features and characteristics of a product that contribute to its ability to meet given requirements. It is the ability of the product to fulfill and meet the requirements of the end user. Quality as it is used in business, engineering, and manufacturing, refers to non-inferiority or superiority of something. It is also defined as being suitable for its intended purpose while satisfying customer expectation (Okorogu, 2017). Quality in manufacturing is a measure of excellence or state of being free from defects, deficiencies and significant variations (business dictionary.com).

Quality is brought about by strict and consistent commitment to certain standards that achieve uniformity of a product in order to satisfy specific customer or user requirements.



Source: Okorogu (2017)

In consideration of product quality framework, firms usually bear in mind the customers or consumers. Fundamentally, consumers are ready to pay high prices for a product but in return would expect best – quality products. If they are not satisfied with the product quality of the company, they will shift and purchase from competitors.

For a firm to win customer loyalty or brand preference, the product in its quality must be very reliable.

PRODUCT RELIABILITY

Product reliability is defined as the probability that a product or equipment will perform satisfactorily for a given time under normal conditions of use. Reliability is therefore related to quality but it is something more than that (Minakshi Jain, 2019).

Quality is concerned with the initial performance of a product or a service whereas reliability is related to the continuation of performance over a period of time.

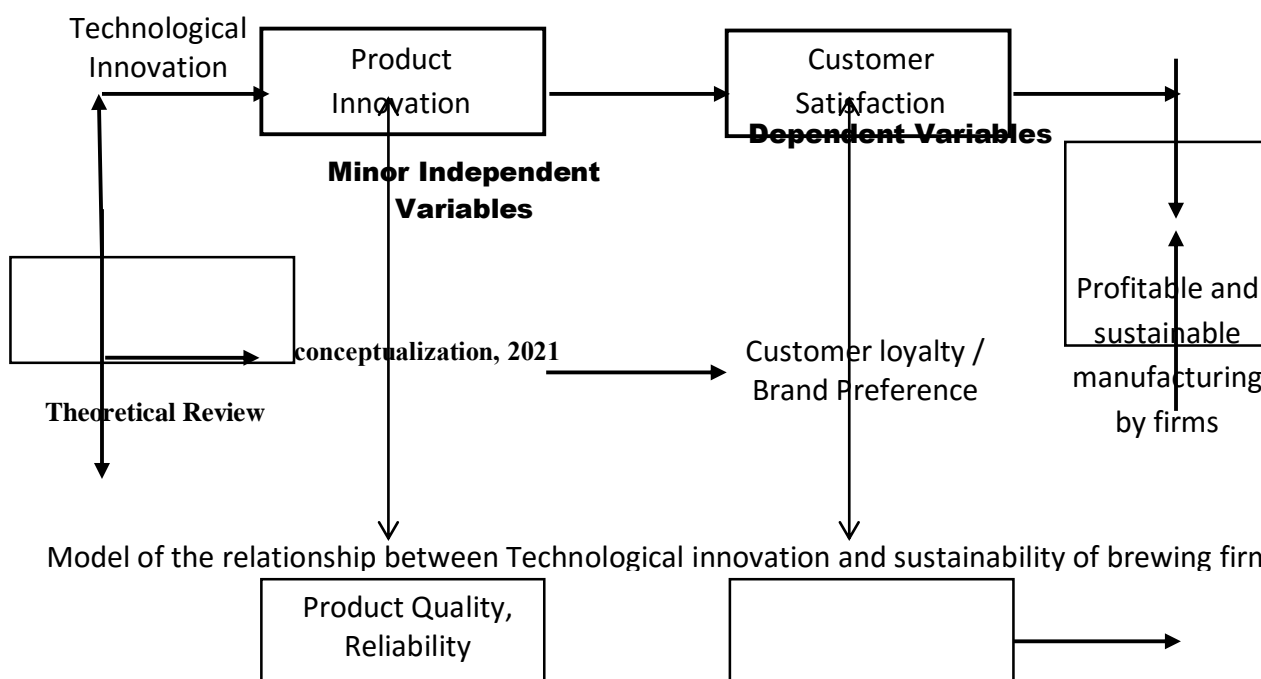
A product having better performance initially may fail to provide the same performance later on. In such a case a product is not considered reliable. Hence the manufacturers should produce not only quality products but also reliable products.

It is important to note that reliability can be measured only if it is expressed in quantitative terms. Probability and time require consideration for measurement of reliability. Whether a product is reliable or not depends on the probability of its failure during a given time period and, the time span for which it provides the rated performance.

To improve the reliability of products, data/information related to failures during a given period of time is collected; adjusted and corrective actions are taken. The measurement of reliability also depends on the type of products (David-Bryan, 2017). Products that are reliable attract a customer’s repeat purchase which is a reflection of his satisfaction with the product. It also indicates that the product did not cause harm or pose any threat to the user.

SUSTAINABLE MANUFACTURING

As stated by the United State Environmental Protection Agency, sustainable manufacturing is the creation of manufactured products through economically – sound processes that minimize negative environmental impacts, conserving energy and natural resources. It is the way of the future that enhances employee, community and product safety. Product safety in my thinking covers product quality and product reliability which is brought about by product innovation. Achieving these two things guarantees market share, profitability, customer satisfaction, customer loyalty, and brand preference, etc. This is the crux of the matter. The nature of interactions and relationship that exist among the variables above are presented in the simple model below:



Model of the relationship between Technological innovation and sustainability of brewing firms

This work is anchored on the theory of Diffusion of Innovation.

The Innovation Diffusion Theory was introduced in 1962 by Everett Rogers, a professor of communication studies, and seeks to explain how, why, and at what rate new ideas and technology spread through culture. The theory provides a foundation for understanding innovation adoption and the factors that influence an individual’s choices about an innovation. Rogers argues that diffusion is the process by which an innovation is communicated through certain channels over time among the participants in a social system. Rogers opined that four main components or elements influence the spread of a new idea: the innovation itself, communication channels used to broadcast information about the innovation, the social system existing around the adopters/non-adopters of the innovation, and the time it takes for individuals to move through the adoption process. The interaction of these components helps one understand why an individual chooses to adopt an innovation or not (Straub, 2009). This process relies heavily on human capital. The innovation must be widely adopted in order to survive.

Rogers presents five stages potential adopters move through in the process. The first is seeking knowledge about the innovation and its functions. The second is persuasion when the potential adopter formulates an opinion about the innovation. The third stage is when a decision is made to adopt or reject the innovation. The fourth stage occurs when the adopter implements the innovation. Finally, the adopter reaches the confirmation stage where they seek reinforcement of their decision to adopt the innovation, implement it and enjoy its benefits or they reject it.

Empirical works

Obienike and Udu (2018), carried out a research study on “technological innovativeness and growth: a study of small scale manufacturing firms in Lagos State”. The general objective of the study was to determine the extent of the relationship between technological innovativeness and firm growth. The study used exploration correlational research design, with a sample population of 11,044 and sample size of 386 determined by Yamane formula. The data gathered was analyzed using Pearson’s product moment correlation and the result shows positive relationship between technological innovativeness and firm growth.

Maja, Jovana and Milica (2018) carried a research on “sustainable technology and business innovation framework – A comprehensive approach”. The paper proposed a comprehensive framework model for structuring multiple sustainability practices. The focus is on relevant sustainability principles of technology and business innovation in relation to basic technology and business innovation models. The researchers developed a set of related matrices indicating the relevant roles and relationship between these principles in achieving sustainable business goals.

“Technology innovation and sustainable entrepreneurship development in Nigeria stakeholders impact assessment in central Nigeria” was studied by Again, Eneji, Nnandym Gukat and Odey (2018). The study focused on economic factors through with interlink with other factors. Supplementary multiple regression analysis is carried out using secondary data. The result indicates that technological innovation and entrepreneurship will increase employment for Nigeria. Also, they observed that institutional environment and capacities to encourage innovation are weak. They recommended the need for Nigeria to evolve a comprehensive public policy for science, technology and innovation.

Yusuf, Adeyemi and Michael (2017) studied “the impact of technological innovation on SME’s profitability in Nigeria” the study examined the impact of research and development (R&D) expenditure, product and process innovations on small and medium enterprises (SMEs) performance in the manufacturing industry in Nigeria using a survey of 1,000 SMEs with a response rate of 52.1% in year 2009. The result with least squares method showed that R&D spending by the firms as well as product and process innovation has significant impacts on the firm’s performance with the probability value of 0.0529, 0.0624 and 0.0086 respectively at 10% level of significance. The study suggests improvement in R&D spending and other technological activities which are expected to increase SMEs profitability and this generate more employment in the country.

Kuo-Jui, Chinz-Jong, Minz-Lanz and Pei-Jay (2015) research on “understanding innovation for sustainable business management capabilities and competencies under uncertainty”. The study adopts interval-valued triangular fuzzy members and grey relational analysis to provide a competitive priority ranking for the aspects and criteria that assist firms in decision-making. The study results indicate that innovation in technology capabilities and networking and social capabilities – in addition to competencies in systemic thinking are the most important aspects of sustainable business management.

Oyewale, Adeyemo and Ogunleye (2013) worked on “technological innovation: an imperative tool for entrepreneurship development in Nigeria. The study analyzed the impact of innovation, technology and on the entrepreneurial development activities in Nigeria. Simple random sampling technique was used to site a total of 12 entrepreneurs from Lagos State that constituted our sample size. The primary data consist of a number of items in well-structured questionnaire that was administered to and completed by the respondents. Regression analysis was used to analyze the data. The results showed that there is significant relationship between technological innovation and entrepreneurship development in Nigeria. They recommend that government should create a friendly or an enabling environment for entrepreneurship and consumer goods to boost the Nigeria economy.

Gap in Knowledge

It was observed from the review of studies above that none of the research findings showed the relationship between technological innovation and the satisfaction of customers who use the products of technology and technological advancement in brewing. This is the gap that this research work will strive to close.

3. METHODOLOGY

As a descriptive research, a survey design was adopted. This was because it sampled people’s opinions by questioning them. The researcher relied on the primary data source which are firsthand data from the field with the use of questionnaire and brief interaction that could pass for interview. The questionnaire was administered on the entire population of the study which is the 170 senior staff of the three brewing firms in the South East Nigeria. The smallness of the study population did not support any reasonable consideration for the determination and use of sample. Consequently, the researcher undertook a census which involved the use of the entire

population of the study. The analysis therefore centered on the entire 170 staff of the affected companies as follows: Intafact Beverages Ltd has 46; Nigeria Breweries Plc is 72 while Golden Guinea Plc has 52 employees. The researcher made use of simple random sampling that allowed every element in the population the chance of being selected. For the study, questionnaire was used as the research instrument, which helped to assess the opinions of the respondents on technological innovation and sustainability of manufacturing firms in South East Nigeria. The questionnaire was designed using the Five point Likert scale that ranges from Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D) and Strongly Disagree (SD). The data collected from the respondents was tabulated and analyzed using descriptive statistics of percentage table of mean and standard deviation. The hypothesis was tested using Pearson Product Moment Correlation aided by SPSS.

DATA ANALYSIS AND DISCUSSION

Table 4.1 Administration of Questionnaire

| S/N | No. Administered | | No. returned/ Percent of No. returned | | No. not returned/Percent of No. not returned. | |
|-----|------------------|-----------------------|---------------------------------------|-------------------|---|-----------------------|
| | No. Administered | % of No. Administered | No Returned | % of No. Returned | No. not Returned | % of No. not Returned |
| 1 | 170 | 100% | 168 | 99% | 2 | 1% |

Source: Field Survey, 2021

The table above revealed that out of the 170 (100%) questionnaire administered only 168 (99%) were returned while 1 (1%) were not returned by some of the respondents.

Question: What is the implication of product innovation on customer satisfaction of manufacturing firms in South East Nigeria?

Table 4.2 The implication of product innovation on customer satisfaction

| S/N | Question Item | Responses | | | | | N | \bar{X} | SD |
|------------------------------|--|-----------|-----|------|-----|------|-----|-----------|------|
| | | SA5 | A 4 | UD 3 | D 2 | SD 1 | | | |
| Product Innovation | | | | | | | | | |
| 1 | Our product innovation/process is done with latest technology | 132 | 32 | 4 | 0 | 0 | 168 | 4.11 | 0.58 |
| 2 | We have a master list of applicable quality documents. | 38 | 108 | 7 | 12 | 3 | 168 | 4.11 | 0.67 |
| 3 | The product design help in maximizing the quality | 82 | 78 | 4 | 4 | 0 | 168 | 4.15 | 0.34 |
| 4 | Employees are committed in ensuring that reliable products are produced | 35 | 120 | 6 | 1 | 1 | 168 | 4.20 | 0.53 |
| 5 | There is a system for regular supply of quality information reports to management. | 89 | 73. | 4 | 1 | 0 | 168 | 4.02 | 0.42 |
| Consumer Satisfaction | | | | | | | | | |
| 6 | Our pricing policy is very competitive | 107 | 49 | 3 | 2 | 7 | 168 | 4.23 | 0.67 |
| 7 | How likely is your customer to buy from you? | 63 | 100 | 0 | 0 | 5 | 168 | 4.00 | 0.57 |
| 8 | Our delivery and support services is helping our customers greatly. | 46 | 104 | 10 | 8 | 0 | 168 | 4.29 | 0.52 |
| 9 | Most of our new customers are through referrals | 49 | 96 | 15 | 5 | 3 | 168 | 4.00 | 0.60 |
| 10 | There is availability of our products in the local market. | 48 | 86 | 18 | 12 | 4 | 168 | 4.11 | 0.85 |

Source: Field Survey, 2021

The table revealed that product innovation which is seen through improved product quality, product reliability and acceptability, endears the customers to the product and invariably promotes customer satisfaction.

Test of Hypothesis

H0₁: Product innovation has no significant effect on customer satisfaction of manufacturing firms in the South East Nigeria.

Descriptive Statistics

| | Mean | Std. Deviation | N |
|-------------------------|--------|----------------|-----|
| Product Innovation | 4.4160 | 0.21126 | 168 |
| Customers satisfactions | 4.2940 | 0.10691 | 168 |

Correlations

| | | Product Innovation | Customers satisfactions |
|-------------------------|---------------------|--------------------|-------------------------|
| Product Innovation | Pearson Correlation | 1 | 0.719* |
| | Sig. (2-tailed) | | 0.015 |
| | N | 168 | 168 |
| Customers satisfactions | Pearson Correlation | 0.719* | 1 |
| | Sig. (2-tailed) | 0.015 | |
| | N | 168 | 168 |

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Statistical Package for Social Science (SPSS v.21)

From the test of hypothesis, the Pearson correlation value of 0.719 shows that the effect of Product Innovation on Customers Satisfaction is positive. The strength of the relationship is strong since the value is greater than 0.3. Since the significant 2-tailed P-value is 0.015 which is less than the P value of 0.05 (significant value by default) reject the Null hypothesis (H₀).

4. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

The findings:

1. There is a positive impact of product innovation on customer satisfaction. Obviously, product innovation and quality is a pivotal element in having satisfied customers. For organizations to create and maintain high product quality, the impact of technology innovation cannot be undermined.
2. The findings also revealed that the more a product is reliable, the more the customers will patronize the company and be loyal to that particular product. In the course of literature review, it was established that product reliability which is an aspect of product innovation has a positive relationship with customer loyalty and retention.

5. CONCLUSION

Technological innovation is very vital for sustainability in manufacturing firms in South East Nigeria. The problem of fluctuating capacity, inability to access modern technology etc. can be better addressed by manufacturers welcoming technological innovations. The cost of adopting and implementing these innovations are very high in the short-run, but in the long-run, the cost implication becomes insignificant to the business as higher returns are recorded.

The findings of the study as presented above clearly established the place of technological innovation on business sustainability. The researcher therefore concludes that for sustainable profitability of any business irrespective of sectors, technological innovations and emphasis on customer satisfaction must be embraced at all levels.

Recommendations

The researcher made the following recommendations:

1. Manufacturing firms should develop a policy to domesticate technological innovation which must be embraced by all stakeholders as a way of sustaining the future of the business.
2. Manufacturing firms should always ensure that customer satisfaction is a priority and taken into contemplation before adopting any kind/type of technological innovations

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