

**IMPACT OF PRODUCT INNOVATION ON THE PERFORMANCE OF  
MANUFACTURING COMPANY  
(A CASE STUDY OF NIGERIAN BOTTLING COMPANY PLC, KADUNA)**

**BY**

**RAJI ABDULYEKEEN ABUBAKAR  
ADM.NO: 13120905015**

**BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT  
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AWARD OF POSTGRADUATE DIPLOMA IN MANAGEMENT**

**NOVEMBER, 2014**

## **DECLARATION**

This is to declare that this project was carried out by me under the supervision of Dr. M.T Namaka of the Department of Business Administration, Usmanu Danfodiyo University, Sokoto. All materials content of this project is to the best of my knowledge. All sources of information have been duly acknowledged by means of references.

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**Raji Abdulyekeen Abubakar**

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**Date**

## CERTIFICATION

This is to certify that this project entitled; *“Impact of Product Innovation on the Performance of Manufacturing Company (A Case study of Nigerian Bottling Company Plc, Kaduna)”* is an original work conducted by Raji Abdulyekeen Abubakar UDUS/PGDM/2014/13120905015, has been read and certified to have meet the conditions and regulations governing the award of Post Graduate Diploma in Management Usmanu Danfodiyo University, Sokoto and it is hereby approved for its contribution to knowledge and literary presentation.

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**Dr. M. T. Namaka**  
**(Supervisor)**

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**Date**

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**Hajia Maryam Koko**  
**(Coordinator)**

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**Date**

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**Dr. S. B. Umar**  
**(Head of Department)**

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**Date**

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**External Supervisor’s Name**

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**Date**

## **DEDICATION**

This project is dedicated to Almighty Allah who is the most gracious and the most merciful for seeing me through this programme.

## **ACKNOWLEDGEMENT**

I am most grateful to Almighty Allah once again whose in his infinite mercy my dream became true. My profound gratitude goes to my project supervisor Dr. M. T. Namaka for taking his most valuable time to peruse this research work despite his tight schedule, may Allah (SWT) reward him abundantly.

I must appreciate my dearest wife Mansurat and my lovely Sons Khaleed and AbdulAzeez for their inestimable prayers and support for the success of this programme. Never do I forget the unquantifiable prayers I received from my beloved parents Alhaji Raji Abubakar and Hajia Sarat Raji. My deep appreciation goes to my project coordinator Hajia Maryam Koko, Head of Department Dr Bagudo and the entire academic and non academic staff of Department of Business Administration for the knowledge they imparted in me. May I also appreciate my sisters for their contribution Hajia Basira Umar, Mallama Farida Muhammad and Maryam. All my course mates and friends are fully appreciated acknowledged, may Allah bless you all.

## **ABSTRACT**

*This study is to examine impact of product innovation on the performance of manufacturing company with a specific reference to Nigerian Bottling Company Plc, Kaduna. The fundamental objectives of the study are to identify the impact of product innovation on the sales of Nigerian Bottling Company Plc, to determine how product innovation improve on the profit of the organization and to ascertain the level of consumers' satisfaction of the company. The primary and secondary sources of data were used for data collection. Questionnaire was administered to 80 staff of the reference organization. Data gathered from the respondents was analyzed and the finding revealed that shortfall in sales and profit is responsible for product innovation due to competitors' market influence; that there is need to increase company's turnover and maximize profit ; that consumers' satisfaction is enhanced; that shareholders fund should be maximized through increase in rate of turnover and profit. It was concluded that the idea behind product innovation does not end in the satisfaction of changing taste of the consumer. It also helps to increase sales and profit of the organization. It was recommended that companies should engage in it regular interval so as to cut down the cost of value analysis strategy which is a segment of product innovation and Companies should ensure that Research and Development Department as well as other sources where new product strategic plan emanated from should be explored not neglected.*

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Innovativeness is one of the fundamental instruments of growth strategies to enter new markets, to perform better in the current market, to increase the market share and to provide the company with a competitive edge. It is motivated by the increasing competition in global markets, companies have started to grasp the importance of innovation, since swiftly changing technologies and severe global competition rapidly erode the value added of existing products and services. Thus, innovations constitute an indispensable component of the corporate strategies for several reasons such as to apply more productive manufacturing processes, to perform better in the market, to seek positive reputation in customers' perception and as a result to gain sustainable competitive advantage. Particularly over the last two decades, innovativeness has turned into an attractive area of study for those researchers who tried to define, categorize and investigate its performance impacts, especially due to its practical relevance. Innovations provide firms a strategic orientation to overcome the problems they encounter while striving to achieve sustainable competitive advantage.

Technological oriented companies have begun to recognize that a blend of innovation and marketing in their overall strategy is vitally important to the achievement of the corporate performance of the firm. The corporate goal of a company could be multifarious but the most common one that cut across many firms in a competitive market is survival, which is achieved through increase in sales and profits. To achieve this goal, the blend of product innovation and marketing concept philosophy must be harmonized with the company's global strategy.

Product innovation on the other hand involves the introduction of a new good or service that is new or substantially improved.

There are stages of product life cycle and these include introductory, growth, maturity and decline stage. The introduction starts when the new product is first launched. Introduction takes time, and sales growth is apt to be slow. Well known products, lingered for many years before the entered stage of rapid growth. In this stage, as compare to other stage, profit are negative or low because of the low sales and high distribution and promotion expenses. if the new product satisfied the market, it will enter a growth stage, in which sale will starts climbing quickly. The early adopters will continue to buy and later buyer will start following their lead, especially if they hear favorable

word of mouth. Attracted by the opportunities for profits, new competitors will enter the market. They will introduce new product features. The increase in competitors leads to an increase in the number of distribution outlets and sales increase. Just to build reseller inventories prices remain where they are or fall only slightly. Companies keep their production pending at the same or a slight higher level. At a particular point, a product's sales growth will slow down, and the product will enter a maturity stage. This maturity stage normally last longer than the previous stages and it posses strong challenges to marketing management. Most products are in the maturity stage of the life cycle and there most of marketing management deals with the mature product. The sales of most products from brands eventually dip. The decline may be slow, or rapid sales may plunge to zero, or they may drop to low level where they continue for many years. This is the "decline stage".

At the declining stage, it will be necessary to innovate product, in order to make it withstand the strong competition from competing products and to suit the changing desires of the customers that consumes the product. As it is widely recognized, needs change over time and companies must reflect these changes in their products if they are to achieve the economic objective of increase in turnover, maximizing profit and satisfaction. Throughout modern

history, most product innovation receives increasing support and attention. The underlying reason is that markets are highly dynamic. A product that was a profitable product yesterday may not be profitable tomorrow.

Furthermore, successful new products command substantially higher profit margin than mature or declining products. Successful new products are profitable –at least for a while before competitors roll out their own me-too products to the market and eventually compete on price basis. Most companies face the inevitable choice of product innovation on gradually fading products for the market. However, it should be noted that product innovation is not only carried out at the declining stage of a product, it can also be done to a totally novel product at the introductory stage.

Marketing of new product goes through a period of growth, reach a peak, and eventually decline. In addition, profit tends to reach a peak and usually begin to decline earlier than sales volume. Optimum sales volume is often reached only after competitors have entered the field, price rivalry has become intense and profit margin have been shortened. To sustain profit, new products/ services may be needed long before sales of established product/ services have begun to fall. The salient causes of product/ services

life cycles may be as a result of instability of consumer demand and instability of competitive position.

Innovation refers to the process that covers product design, production system design, product introduction processes and start of production (Johansen, 2005). “This includes the generation of opportunities, their selection and transformation into artefacts (manufactured products) and activities (services) offered to customers and the institutionalization of improvements in the New Product Development (NPD) activities themselves” (Ebrahim 2010).

It is against this background that the study investigates impact of product innovation on the performance of manufacturing company.

## **1.2 Statement of the Problem**

The experience of most manufacturing companies under recessionary economy is largely characterized by low-consumer demand except for certain products, the demand of which is quite inelastic, most companies in Nigeria usually strive hard to improve on their marketing activities as demanded by environment and at the same time, remain in business.

The effect of low- consumer demand would result in low sales performance, shortfall in profit and low consumer patronage which all have great

implications on the attainment of the organizational objective. In order to actualize the organizational objective, the company (Nigerian Bottling Company Plc) came up with the strategic plan of improving and developing new product to remedy its problems.

Companies competing in this fast-paced industry must be able to effectively manage innovation to ensure growth. Unfortunately, there are notable challenges in today's environment: product design is more intricate, regulatory requirements are more rigorous, quality and production processes are more complex. Moreover, companies are managing many more new ideas and, partly driven by the growth of private labeling, have greatly expanded their product portfolios. And, because of the urgency of getting new products or product changes to market, avoiding costly errors is made much more difficult. These obstacles help to explain why the food industry is one of the few where time-to-market for new products, line extensions, and reformulations is actually increasing.

In this research work, an attempt would be made to evaluate and geared toward priority to look into the associated problems and rendered solution to them and to make some viable recommendations to the company.

### 1.3 Objectives of the Study

The objective of the study is to examine the impact of product innovation on the performance of the organization. The specific Objectives are:

- i. To identify the impact of product innovation on the sales of Nigerian Bottling Company Plc.
- ii. To determine how product innovation improve on the profit of the organization
- iii. To ascertain the level of consumer satisfaction.

### 1.4 Research questions

The research would seek to address the following questions:

- i. What is responsible for product innovation in Nigerian Bottling Company Plc?
- ii. How does the company source for strategic plan for new product?
- iii. What are the short- term and long- term impact of product innovation to the organization?

### 1.5 Statement of Hypotheses

The following hypotheses are formulated to guide this study:

Ho<sub>1</sub>: Production innovation has impact on the sales of the company.

Ho<sub>2</sub>: Product innovation increases the profit of the organization,



H<sub>03</sub>: Product innovation does not have impact on the level of consumers' satisfaction

## 1.6 **Significance of Study**

The output of this project will be of great value to manufacturing companies that are involved with technological products. Firms will be able to apply market performance knowledge of innovative products in designing their innovation funnel and not inhibit their innovative capacity by using fixed rules and standard to all products. The analysis from market trend can help to decide on the type of innovation strategy to embark upon, how to effectively use product innovation as a distinct strategy. In addition, this project will also highlight ways through which this important aspect of product development can be improved upon. The output of this research would also be useful to the following categories of people:

The organization taken as case study: The result and recommendations from this research work would help product managers to see product innovation as part of their task by bringing them out of the shell of just rolling out products without monitoring its life cycle.

To the other organizations within the same industry of which the case study belongs: This will also assist in fashioning out the business model to

maximize sales, profit and consumer satisfaction that is re-directing their products to meet the change in tastes of the consumers.

This would serve as a source of information to other researchers of product innovation in the academic field of marketing.

### **1.7 Scope of the Study**

The scope of this study is to examine the impact of product innovation on the performance of manufacturing company. This study would be restricted to Nigerian Bottling Company Plc, Kaduna. The study will also be strictly within the framework of the stated objectives.

The study also covers the degree to which it takes into account marketing strategies in proper marketing of its product. Also all other area related to the actual function of marketing will be studied for the purpose of knowing the extent of their relatedness.

### **1.8 Limitations of the Study**

Some problems were encountered in the course of executing this research.

Typically, non co-operation from some of the respondents and difficulty in retrieving some of the questionnaires.

## 1.9 Definitions of Terms

**Impact:** Measure of the tangible and intangible effects (Consequences) of one thing's or entity's action or influence upon another.

**Product:** anything that can be offered to a market that might satisfy a want or need.

**Innovation:** The process of translating an idea or invention into a good or service that creates value or for which customers will pay.

**Performance:** The action or process of carrying out or accomplishing an action, task, or function.

**Manufacturing:** The process of converting raw materials, components, or parts into finished goods that meet a customer's expectations or specification.

**Company:** A voluntary association formed and organized to carry on a business.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter brings together the views, ideas and opinion of different authors and professionals in the field of marketing and innovation in respect of the research topic. The various information in this chapter are therefore collected from secondary sources such as quotations and personal reviews of magazines, journals, seminar papers and textbooks.

#### **2.2 Marketing Concept**

The satisfaction of the consumers has now become one of the means through which an organization could survive. The consumers who are regarded as “Kings” are now governing the business environment. In essence, we are now in the consumers’ or buyers’ market and a company with intention of making profits, increase turnover will have to include customer satisfaction as part of its strategy.

Marketing concept is now the new philosophy in the business world.

Stanton (1988) describes this concept as:

*“Marketing concept is a business philosophy which assumes that ‘consumer-need satisfaction’ is the economic and social justification for a firm’s existence. It is a guide to business planning which aim at analyzing and maximizing company objectives while satisfying consumer demand. The concept*

*believes that instead of a Firm trying to market what is easiest for it to make, it must find out ore about what customers wants and is willing To buy”*

In other word, the marketing concept is a new concept whereby all company’s planning and operations should be customer-oriented while profitable sales should be firm’s goal. The purpose of adopting this new philosophy of business is to improve customer relations because better relationships would also benefit the firm as earlier mentioned. Profit enables a firm to grow and even provide many satisfactions to customers and to strengthen the economy as a whole. Many firms do set goals of increased sales or a greater share of the market. However, increase in sales may lead to profit maximization.

This theory is captured in Nickels (1986) and stated as: “One goal of business firm is to make profit, for without profits the business will eventually fail.

### **2.3 Product Defined**

Boonz and Kotler (2004) see a product as “tangible tasks that satisfy the consumer and industrial user when efficiently developed and distributed to chosen market segment.

Stanton (2002) defines product as "a set of tangible and intangible attributes include packing, colour, price, manufacturers and retailers service which the buyer may accept as offering want satisfaction".

McCarthy (2002) ascertains that a product is "the benefit derivable from a physical entity or service marketed". From the above definition, it can be clearly seen that when a consumer set out to buy a product, he actually desires to satisfy a need and thus sees the product as a means of satisfying ones desire.

Kotler (2006) defines product as "any want satisfying goods and services out of its perceived intangible attribution. This lead to emphasis on consumers satisfaction, which is the ultimate motives for buying the product by the users".

It is opined that a product is any entity (goods or services) or idea that consumer believes will satisfy a want or desired.

### **2.3.1 New Product Defined**

Kotler (2008) sees new product as "a product perceived by the consumer as such. In other words, the key element in determining what a new product is, is that is consumer perception rather than the degree of technical change. He further concludes that companies which fail to distinguish between new

product and line extensions tend to exaggerate their level of innovative activity”.

Roberts (1993) defines a new product as “any product which has previously experienced by consumer, however, long it may have been in the market. This is to say that for a product to be new in his own view, it should not gain a previous knowledge of the consumer or potential customers, even if has stayed long in the market”.

Bridge (1977) depicts that new product “is what the consumer sees and consider as being an additional to the available choice he or she has and the firm on the other hand considered a product as new when such brand is new to the company and this may include on existing one that has undergone some significant modification or product initiated from competition or to innovation in its entirely original product”.

We may conclude that a new product may be an invention or innovation or a modification of an existing product to an extent that consumers perceive the modified version as different. It may also be an existing product just entering a new market.

### 2.3.2 Product Classification

Kotler et'al (1999) captures that, before an examination of individual product decisions, products can be classified according to their durability and tangibility. He further stressed the following as classification of product.

- I. **Consumer Product:** Consumer products are those bought by final consumers for personal consumption. Marketers usually classify these goods based on consumer shopping habits. Consumer products include convenience products, shopping products, specialty products and unsought products. These products differ in the way consumer buys them as well they differ on how they are marketed.
- II. **Convenience Product:** These are consumer goods and services that the consumer usually buys frequently, immediately and with a minimum of comparison and buying effort.
- III. **Shopping Products:** These are less frequently purchased and consumers spend considerable time and effort gathering information and comparing alternative brand carefully on suitability, quality price and style.
- IV. **Special Product:** These are consumer goods with unique characteristics a brand identification for which a significant group of buyer is willing to make a special purchase effort.



- V. **Unsought Product:** There are consumer goods that the consumer either does not know about or does not normally think of buying.
- VI. **Industrial Product:** Are those bought for further processing or for use in conducting a business. Thus, the distinction between product and an industrial product is based on the purchase for which the product is purchased.

## 2.4 Innovation Defined

Innovation as a term is not only related to products and processes, but is also related to marketing and organization. Teece (1988) describes different types of innovation: new products, new methods of production, new sources of supply, the exploitation of new markets, and new ways to organize business. Drucker (1985) defines innovation as the process of equipping in new, improved capabilities or increased utility.

OECD Oslo Manual (2005), which is the primary international basis of guidelines for defining and assessing innovation activities as well as for compilation and use of related data, has been taken as the fundamental reference source to describe, identify and classify innovations at firm level.

In the OECD Oslo Manual (2005), four different innovation types are introduced. These are product innovation, process innovation, marketing

innovation and organizational innovation. Product and process innovations are closely related to the concept of technological developments.

*A product innovation is the introduction of a good or service that is new or significantly improved regarding its characteristics or intended uses; including significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics (OECD Oslo Manual, 2005).*

Product innovations can utilize new knowledge or technologies, or can be based on new uses or combinations of existing knowledge or technologies. The term product covers both goods and services. Product innovation is a difficult process driven by advancing technologies, changing customer needs, shortening product life cycles, and increasing global competition. For success, it must involve strong interaction within the firm and further between the firm and its customers and suppliers (Akova et al., 1998).

*A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. Process innovations can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products (OECD Oslo Manual, 2005).*

Fagerberg et al. (2004) stresses that while the introduction of new products is commonly assumed to have a clear, positive effect on the growth of income and employment, process innovation, due to its cost-cutting nature, can have a more hazy effect.

A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing (OECD Oslo Manual, 2005). Marketing innovations target at addressing customer needs better, opening up new markets, or newly positioning a firm's product in the market with the intention of increasing firm's sales. Marketing innovations are strongly related to pricing strategies, product package design properties, product placement and promotion activities along the lines of four P's of marketing (Kotler, 1991).

Finally, an organizational innovation is the implementation of a new organizational method in the firm's business practices, workplace organization or external relations. Organizational innovations have a tendency to increase firm performance by reducing administrative and transaction costs, improving workplace satisfaction (and thus labor productivity), gaining access to non-tradable assets (such as non-codified external knowledge) or reducing costs of supplies (OECD Oslo Manual, 2005).

## **2.5 Product Life Cycle**

Product, like any normal human being has a life cycle, which dictates the strategy to be adopted by the product developers or managers. The stage in

which the product is in the life cycle could be determined or known through the sales performance of the product in the market. Robert (2005), said that; “product life cycle is a model that describes a product’s sales, profits, customers, competition and marketing effort from its introduction to its removal from the market”

It can also be described as a graphical portrayal of the sales history of a product, the time when it is introduced to the point when it is withdrawn.

Product life cycle has four major stages, which are described below:

**I. Introduction:**

This is the period during which a new product is introduced into the market. The product is newly launched or just fully commercialized. This stage in the product life cycle is usually over burdened with high production cost as well as other marketing costs. In addition, this stage is usually accompanied by heavy promotional activities because of the need to inform potential buyers of the existence, uses, application and advantages of the new product. For highly innovating products, price are usually high to cover cost of production and marketing, profits, if any, are small in this phase of the life cycle. This stage is characterized with the risk because the product can either fail or succeed.

## II. **Growth:**

If a product survives the introductory stage, it moves into the growth stage of the life cycle. This stage starts with the acceptance of the product in the market. The first symptom of the appearance of the growth stage is therefore a rapid increase in the sales volume. Due to the improvement in sales volume, some of the cost will now be absorbed and so there will be the emergence of profit. This stage will equally witness the moving up on the curve of the product in terms of sales and profit. This is equally noted by competing firms, who will quickly come up with identical or modified product. There is an increase in demand. It is of vital importance to mention at this stage of product innovation will be necessary at this stage of product's life cycle. The innovation could be partial innovation or total innovation. This is because consumers always want "new" products because they feel the quality of the "new" product will be better than the already existing one.

## III. **Maturity:**

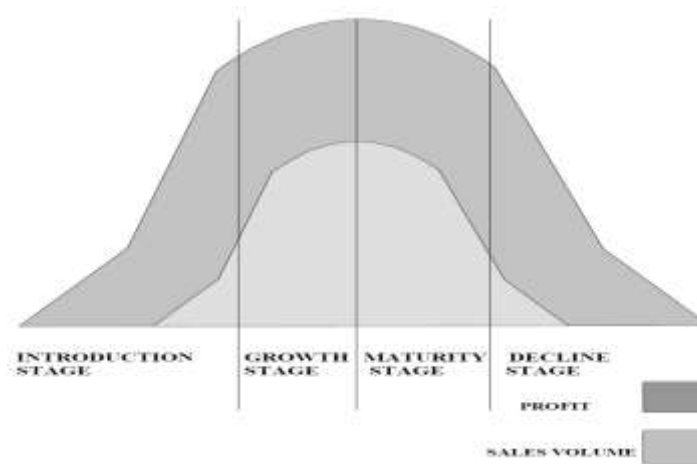
The emergency of this stage is usually accompanied by an increase in both sales and profit but at a decreasing rate. Most products that exist today are in the maturity stage. Normally, this is the longest stage of the cycle, competitive activities are now at its tightest, and many rival companies are now seriously competing for the market. Some emulators may be coming up

with an inferior version of the product to enable them penetrate into the market. Promotional activities are very moderate since the brand is already established in the market. Advertising efforts will be directed towards reminding the consumers about the existence and potentials of the product in the market.

#### IV. **Decline:**

A continuous decrease in profits and sales are the two major symptoms of the appearance of this stage in the product life cycle. Since the product is making minimal or no contribution to profit, weak competing firms will be forced to leave the market. Therefore, very few firms will be left in the market. The rate of decline is governed by how rapidly consumers' taste change and/or substitute products are adopted. The rapid decrease in sales will push cost up, thereby eliminating profits either entirely or into the very low level. It is of great importance to note here that not all products face an inevitable death as they move along the life cycle. Sometimes they can be given new life through repositioning, product modification or product innovations.

## A Product's Life-Cycle Diagram



**Figure 2.1** Sales Volume Curve and profit Curve in Relation to a Product's life cycle

### 2.6 Product Innovation

The word innovation has now become a popular vocabulary among managers “the watchword for management now is innovate or die”. This in essence means that a company that fails to innovate its product will ultimately die.

Gordon (2000) states that innovation covers all that goes on from the beginning of an idea, to an invention, through to the marketing of a new product and the use of a new process .Innovation, in fact, continues until the new product or process has been completely introduced into the economy, along with any modifications and improvements. It could be said that

innovation begins with an idea and ends with the widespread use of new product and widespread new process diffusion”

Product Innovation involves the conceptualization, commercialization, development, design and validation of new product which provide higher value/utility to all the stakeholders of that product. It is a basic approach of creating competitive advantage in the global business environment (Rainey, 2005). PI is defined by different scholars differently. Product innovation is the development of a new product or any variation in the existing design of the Product, use of any new raw material for its production, addition of any other feature and components in the existing product is called Product Innovation. In other words thing which is new for business product is consider as product innovation.

Product Innovation affects every part of the organization. Strategic planning, sales customers, shareholders, finance department, purchase department and operation and production department all are affected by Product Innovation. (Rakesh *et al.*, 2006).

Differentiating the innovation on the basis of technology leads towards two types of innovation. Technological innovation and non-technological innovation. While Technological Innovation is characterized by new



technical knowledge of production, new products (goods and services (and use of new material in production.

Product innovation encompasses all the efforts put into a product from conception to development and commercialization to meet the needs and expectations of customers and all stakeholders. This concept has also become an essential strategic approach for creating competitive advantages in the dynamic, highly competitive global business environment. It has become a common belief that a business enterprise has only two basic functions: Marketing and Innovating. Various studies have shown that the growing industries are those that are oriented to new products. Product innovation has become a powerful tool for keeping the company aligned with changing market conditions.

Companies develop new products to meet shifting consumer demands, to capitalise on new technologies and to keep ahead of competition. Being innovative is seen as a necessary strategy for the modern day businesses. Generally, a product cannot continue to satisfy target market or consumers and contribute to achieving an organizational overall goal indefinitely. To maintain an effective product mix, a firm just has to modify its existing products or introduce new ones.

Recently, consumers have been more selecting in their choice of products. As consumer's disposable income has increase, and as an abundance of products has become available, consumers have fulfilled many of their wants with the idea of dumping any product into the market, consumers have now become more selective. In view of this, a company that wants to survive just has no opinion than to innovate than imitate. Stanton (1988) states that;

*“If market satisfaction in terms of quality does exist to some extent, it follows that consumers may be more critical in their appraisal of new products. While the consumer is being selective, the market is being delayed with products that are imitations or that offer only marginal competitive advantages. This situation may be leading to “product indigestion”. The cure is to develop really new products – to innovate and not just imitate”*

Product innovation could make an old product become new. An obsolete product could be modified to satisfy the needs of it users more than ever before. Thus, one is now compelled to ask, what is a new product? This question has become inevitable because of the impression created on product through product innovation, which makes an obsolete product to be new again.

It will be difficult to have a definition of what a new product is. However, the most important fact is that new products are in categories. Each separate category may require different marketing program's to ensure a reasonable

profitability of market success. Stanton (1988) describes the three categories of new products as follows.

- a) “Product that is really innovated (new-to-the-world products) – truly unique produce for which there is a real need but for which no existing substitutes are considered satisfactory. An example is 3M’s introduction of Post-it-Note and Sony’s introduction of the Walkman
- b) Replacements for existing products that are significantly different from the existing goods (line /product extension).An example is 3M’s extension of its original 1-in by 1-in post it note into a wide range of different sizes
- c) Imitating products that are new to a particular company but not new to the market (me-too /new-to-us products). The company simply wants to capture part of an existing market”.

The word “new” could mean minor changes in the quality, size, packaging, price or any other attributes of the product. A product may be a failure in the market probably because it’s bad packaging or quality. Hence, a good product manager will just have to make necessary corrections if the product is to gain market acceptance. The necessary corrections which is innovation will make the product to be appear seemingly new to the consumers. In essence, product innovation focuses on improving the product delivery

capability and strategic position of the organization through creativity and leadership. Product innovation includes several essential areas as stated in David (2001):

- 1) Examining the needs for new products, processes and services.
- 2) Determining the proper direction and fit for new products.
- 3) Establishing the appropriate game plan of the entire management system for developing and commercializing new products.
- 4) Selecting new product opportunities for investment.
- 5) Enhancing the organizational capabilities to create successful new products.
- 6) Creating the new product and executing the new-product development (NPD) program.

## **2.7 Purpose of Product Innovation**

The social and economic justification for the existence of a business is its ability to satisfy its customers. A company meets its basic responsibility to the society through its product. Unless it fulfils this mission, a firm should not exist. In actual sense, the competing forces in our socio-economic system do not permit it to exist, at least not for long. A product that fails to meet the changing taste of the customer may end up as a failure in the market thereby causing the failure of the company as a whole, which could

led to its closure. Stanton (1988) postulates that a company cannot successfully sell out a poor product over a long the long-run. Often, it is easy to create a demand for initial sales. But a company needs a good product to get repeat sales, and repeat sales are needed to stay in business. Product innovation is essential for growth. A company that does not make innovation may die down or remain stagnant. In recent years, consumers have been more selective in their choice of products. If market satisfaction does not exist to some extent, it follows that consumers may be more critical in their appraisal for new products. Thus, product innovation will enable a company to attract the consumers through its ever dynamic product range.

Product innovations also enable company to increase its profit. This is possible through the additional sales volume brought about by the innovation of the products. Since product innovation aims at a best satisfying the needs of the consumer, there s the tendency for the consumers to go for such product, and in the long run the profit of the company will increase as a result of increase in sales.

In addition, the company's profit can also be increase through the innovation of product. This can be done when the cost of a product is reviewed with the intention of reducing the cost of production. This concept is known as Value Analysis.

Furthermore, product innovation affords the company the opportunity to fight competitors successfully. A company that fails to innovate its product may have to be edged out of the market by competitors. Product innovation provides a company with opportunity to continue to exist in the market. This can be due to the satisfaction of customers changing needs of the companies. Kotler (1984) in his own contributions to the impact of product innovation has this to say,

*“Under modern condition of competition, it is risky for a company to rely only on its existing product(s) customers want and expect a stream of new and improve products. Competition will do its best to meet this desire. A company’s programme that induce searching for new product is necessary”*

David (2001) observes that the primary objectives of product innovation are to create value and to achieve long-term success through the development and commercialization of new products and services. Product innovation could be resorted to when there are shortages of materials. The shortages could force the company to look for other substitute, which will force the product to have a different outlook. For example, in the brewing industries, the shortage of wheat has forced these industries to use maize as substitute to wheat.

## 2.8 Product Design

Product design is often misunderstood as a concept. It is commonly seen, even by managers of companies, as the process of making products look aesthetically pleasing or stylish. Most product designers understand product design to mean much more than this. Product design is a multi-disciplinary process which usually involves market and technological research, concept design, prototype development, final product development and testing as well as post production refinement. Product Design is defined by Walsh et al (1992: 18) as:

*"The activity in which ideas and needs are given physical form, initially as solution concepts and then as a specific configuration or arrangement of elements, materials and components"*

Product design does not usually imply the utilization of new technologies to create novel products. Typically, it entails the refinement or upgrading of existing designs, to improve functionality, performance or appeal. Another goal is to lower the cost of manufacture for competitive advantage. New technologies may be used in existing/established products, for example in using microprocessors to control and improve energy efficiency and water use in washing machines. Product Design can also involve adapting products for particular markets or environments.

Product design can be sub-divided into different types; mechanical component design, electronic design, aesthetic design, industrial design, engineering design and graphic design. While product design is carried out in almost all industries, it is not necessarily done in a systematic fashion by professional designers. In many instances design is carried out by a draughts person, production manager or tool person. This would be typical of companies in developing countries and smaller companies in industrialized countries. This is what Gorb and Dumas term "Silent Design" (Gorb and Dumas, 1987). These silent designers may have no training in design. Design activity may consist of copying and adapting existing products or "Sketching on the back of a cigarette packet". (Walsh et. al. 1992: 22).

Freeman, 1983: cited in Walsh et'al (1992: 22): identifies four kinds of design activity;

- a) **Experimental design:** The design of prototypes and pilot plant leading to the preparation of production drawings for the commercial introduction of a new product or process
- b) **Routine design engineering:** The adaptation of existing technology to specific applications (typical of the design work done by many engineering firms when installing new plant or equipment)



- c) **Fashion design:** Aesthetic and stylistic design of items ranging from textiles and shoes to chairs, car bodies and buildings (this kind of design may result in novel forms, shapes or decorations, but often involves no technical change at all)
- d) **Design management:** The planning and co-ordinating activity necessary to create, make or launch a new product in the market.
- e) In summary, there is considerable overlap between Research and Development (R&D), innovation, new product development and product design, however product design is much more widespread in industry than R&D (Walsh et al 1992:19). Pure research is usually carried in universities or for example, in agricultural research centres. Further R&D is carried out by some companies, typically in industries such as chemicals, pharmaceuticals, and aerospace. Innovation involves a new invention being matched with a market need. New product development is the term given to the process of bringing new or updated products to the market. Product design describes the creative process in researching markets, innovations and needs, then transforming ideas into products for particular markets.

### **2.8.1 Overview of Product Design Process**

Product design time can be reduced by using a team approach and the early involvement of key participants including marketing, research and development, engineering, operations, and suppliers. Early involvement is an approach to managing people and processes. It involves an upstream investment in time that facilitates the identification and solution of downstream problems that would otherwise increase product design and production costs, decrease quality, and delay product introduction (Augustine, Yadav, Jain, and Rathore, 2010).

Blackhurst, and O'Grady, (2005) opine that time-based competitors are discovering that reducing product design time improves the productivity of product design teams. To reduce time, firms are reorganizing product design from an "over-the-wall" process to a team-based concurrent process. Over-the-wall means to proceed sequentially with the limited exchange of information and ideas. When this approach is used, problems are often discovered late because late-stage participants are excluded from decisions made early in the process. As a result, poor decisions are often made.

Product design is a labor-intensive process that requires the contribution of highly trained specialists. By using teams of specialists, communications are enhanced, wait time between decisions is reduced, and productivity is

improved. Participants in this team-based process make better decisions faster because they are building a shared knowledge base that enhances learning and eases decision-making. By sharing development activities, design decisions that involve interdependencies between functional specialists can be made more quickly and more effectively. This reorganized process creates a timely response to customer needs, a more cost-effective product design process, and higher-quality products at an affordable price.

Blackhurst, and O'Grady, (2005) are of the opinion that there are several reasons why early involvement and concurrent activities bring about these improvements. First, product design shifts from sequential, with feedback loops that occur whenever a problem is encountered, to concurrent, where problems are recognized early and resolved. The ability to overlap activities reduces product design time. Second, when a team of functional specialists works concurrently on product design, the participants learn from each other and their knowledge base expands. People are better able to anticipate conflicts and can more easily arrive at solutions. As a result, the time it takes to complete an activity should decline. Thirdly, fewer changes later in the process results in faster and less expensive product design. When problems are discovered late, they take more time and money to solve.

Gerwin, and Barrowman (2002) state that product design requires the expertise and decision-making skills of all parts of the organization. Marketing, engineering, operations, finance, accounting, and information systems all have important roles. Marketing's role is to evaluate consumer needs, determine potential impact of competitive pressure, and measure the external environment. Engineering's role is to shape the product through design, determine the process by which the product will be made, and consider the interface between the product and the people. Operations' role is to ensure that the product can be produced in full-scale production. Finance's role is to develop plans for raising the capital to support the product in full-scale production and to assist in the evaluation of the product's profit potential. Accounting and information systems provide access to information for decision making. Cross-functional teamwork and knowledge sharing are thus keys to success.

### **2.8.2 Product Design Specification (PDS)**

The Product Design Specification (PDS) is a detailed document which sets out the marketing and technical parameters of a product. Marketing specifications describe the target market, price, image and performance requirements of the product. A consideration basic to all good design is the factor of cost. The technical specification is more detailed and describes

such aspects of the product as: what the product must do, weight, size, power consumption, location and user environment, ease of use, standards applicable, cost requirements, materials, manufacture, reliability, maintenance, packaging and how the product will be transported: from the factory and in use. The document sets out the parameters within which the product is designed. The document does not limit the design solution, so for instance, the material specification might be; "non-toxic" or of a certain strength/weight ratio – thus ruling out some materials but not excluding others. The document is usually drawn up by several departments within a firm and includes the designer(s) (Pugh, 1990).

### **2.8.3 The Design Process**

In general, the formal process of design is remarkably similar across a range of products and design disciplines from architecture to product design to fashion.

According to Pugh (1991) the product design process generally involves the following steps:

- Examination of market needs
- Problem/need analysis and the Design Brief
- Product Design Specification
- Concept development and prototyping

- Embodiment design
- Detailed design
- Design for manufacture
- Design review and evaluation
- Post production design and improvement.

## **2.9 Product and Process Innovation in Manufacturing Companies**

In this study special interest is drawn to the innovation process of manufacturing companies. Innovation is regarded as a crucial factor for the survival and the competitive strength of any industrial firm. Industrial firms have to adapt to increasing global competition and dynamics.

This results in a large number of innovative products, processes and services developed by the companies. The part of new products in the companies' product portfolio increased in the last years. For industrial firms the development of new products and services is the engine of growth. The firm's competitive position is determined by the ability to innovate its product portfolio and the time required to bring new products to the market. Firms have to launch new sophisticated products in increasingly fast cycles and their ability to ramp up to full scale production volume rapidly is crucial for success (Pisano 1997). With product life cycles getting shorter it becomes even more essential to expand commercial production process

capacity rapidly to generate sales revenues and recoup development investments.

Innovation is the focal point in the business strategy of any industrial firm. Industrial Companies are complex and dynamic systems showing numerous interactions with their environment. The management successful adoption of innovations in these companies is a complex and difficult venture which has to take into account a large number of internal and external factors. Purpose of this paper is the investigation of the mutual interactions and consequences of product and process innovations in manufacturing companies.

For industrial companies innovations of the product system and particularly innovations of the related processes are essential. Due to technological facts there is a tight relationship between technical products and the processes implemented to generate these products. Developing innovation strategies management has to take into account the underlying product-process interactions. Changes in the product system have significant consequences for the firm's manufacturing system and for technical and administrative processes (Kim et al. 1992).

Before introducing new products changes in process requirements have to be considered. The tightness of the relationship between product and process features varies with the industrial sector. In the process industries like

chemicals, pharmaceuticals, and biotechnology (“Process Driven”, “Process Enabling”, Pisano 1997) an extraordinary close relationship between products and production process can be noticed. Innovation management in manufacturing companies is asked to create integrated innovation and manufacturing strategies. An improved performance of manufacturing companies can be expected from tighter linkages between product and process innovation (Kim et al. 1992). “Managing this product-process connection is one of the top challenges of the era” (Ettlie 1995).

For a development of integrated innovation and manufacturing strategies considering the tight product-process interaction an investigation of the interdependencies of product features and the related production processes seems to be useful.

### **2.9.1 Linking Product and Process Innovation**

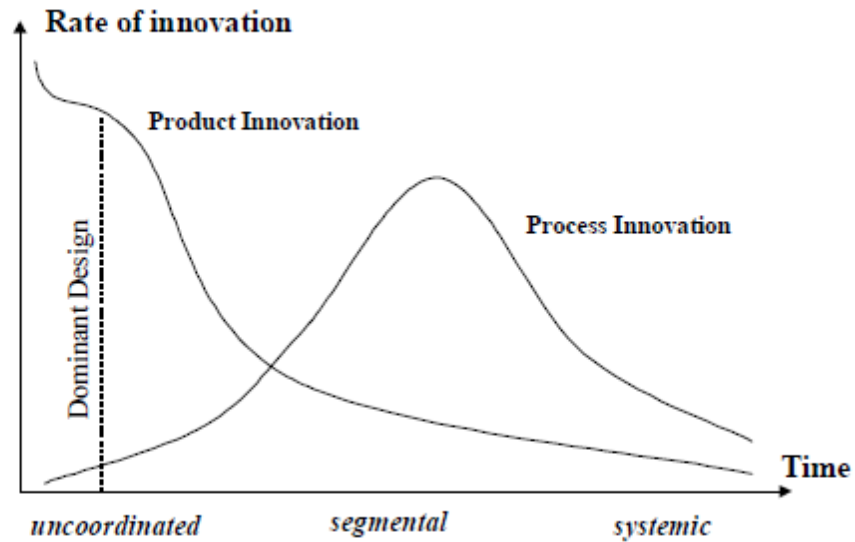
For industrial companies innovations of the product portfolio as well as innovations of the processes generating these products are essential. In many cases the scientific literature focuses either on product innovation or on process innovation without explicitly taking into consideration the interaction between product and process innovation. The product-process life cycle theory of Utterback and Abernathy (Utterback, Abernathy 1975) provides a useful model helping to understand the pattern of many industrial



innovation processes. This model succeeds in encompassing the mutual relationships between the stages of a product's life cycle, the related production process` stages of development and competitive strategy.

By identifying, and then separating, process and product innovations the industrial innovation pattern could be related to three different stages of the innovation process: the uncoordinated, the segmental and the systemic.

Utterback and Abernathy notice that the rate of product or process innovation depends on the present stage of the product's life cycle. It has to be mentioned that this concept can refer to the life cycle of a single product line and its manufacturing process as well as to a specific product generation and the growth of a whole industrial branch related to this generation of products. The process of substitution by a completely different, sophisticated kind of products is not in the focus of investigation.



Source: Butler, J.E. (1988)

**Figure 2.2:** *Utterback/Abernathy's model of industrial product and process innovation*

The first stage of the innovation process—the uncoordinated stage—is characterized by frequent changes in product design and low productivity of the related process. In this stage competition is merely based on product performance, a dominant product design has not evolved yet. Due to the uncoordinated and low integrated production process (technological and organizational) there are low constraints for product improvements. These frequent changes of product features inhibit process standardization efforts, which results in higher production costs.

After the emergence of a dominant product design, the firm or the industrial branch gradually enters the segmental stage. Specialized production

equipment is introduced, the rate of innovation related to the production process increases, and the process becomes more coordinated. In this stage product innovations requiring radical changes in the production process are avoided, the rising of the product innovation rate diminishes. Production costs decrease which leads to increasing sales and higher production volume.

In the systemic stage complex, highly integrated technological solutions are implemented in the firm, the production system is further standardized while cost minimization becomes an important goal. Tighter linkages between product and process features occur. Product and process changes are highly interdependent which must be taken into consideration by management. The process of standardization reduces the probability of further fundamental innovation in both the product and the process system. Due to these constraints both the product and the process innovation rate decrease.

As Utterback and Abernathy relate the three identified stages to the competitive strategies performance maximization, sales maximization, and cost minimization their approach has as well descriptive as normative attributes. The model provides explanations about systematic variations in the innovation process of industrial companies fundamental ideas of possible and plausible cause and effect relationships suitable for the generation of a System.

Dynamics Model Implementing the fundamental ideas of the Utterback/Abernathy approach into a System Dynamics model specific adaptations taking into consideration the recent advances in sophisticated flexible production systems and computer aided manufacturing are necessary. These technological innovations in the recent years permit a higher degree of product variation at later stages. Nevertheless the fundamental ideas of this concept can be found in current literature (Ettlie 1995, Damanpour and Gopalakrishnan 1999) and the concept still appears to be valid for many industrial settings (Butler 1988).

Following the concept of Utterback/Abernathy, Hayes and Wheelwright suggest a two dimensional product-process matrix linking product life cycle stage and process life cycle stage and reflecting a company's position in the interrelated product-process system. The matrix represents the interaction of both the product and the process life cycle. The process life cycle-rows of the matrix represent the process structure with increasing standardization towards the systemic form. The product life cyclecolumns represent the product structure going from great variety to highly standardized products. This matrix is helpful in describing industrial companies' strategic options particularly with regard to the manufacturing function. The Hayes/Wheelwright matrix concept provides substantial support in

determining the direction and timing of innovation decisions in the light of a company's manufacturing capabilities.

Building on the ideas of Hayes/Wheelwright and the generic strategy typology proposed by Porter an ongoing conceptual framework is provided by Kotha/Orne. Using the dimensions "product line complexity" and "process structure complexity" this framework suggests a link between several critical elements in manufacturing competitiveness (Kotha, Orne 1989). It considers both the content of fit and the process of fit between structure, strategy, technology and performance. It recognizes that the execution of the more generic business unit strategy inherently involves manufacturing and postulates the fit of between business-level strategy and manufacturing structure.

Kotha/Orne relate high process structure complexity in manufacturing and lower product line complexity to the strategy of cost leadership while the strategy of differentiation is related to higher product line complexity and lower process structure complexity. The company's "process structure complexity" is characterized by the level of mechanization, systemization and interconnection of the production process while "product line complexity" is mainly characterized by the end product's complexity and variety and its maturity in the product life cycle.

The frameworks of Utterback/Abernathy, Hayes/Wheelwright and Kotha/Orne represent integrative approaches all succeeding in illustrating the tight interconnections between product, process and strategy in manufacturing companies. Applied to industrial innovation management these synthesized frameworks give valuable hints for the development and implementation of specific types of innovation. They provide support for decision-making concerning the specific type, the timing and the extent of innovation in relation to maturity in product life cycle, manufacturing structure as well as in relation to manufacturing strategy and competitive strategy.

## **2.10 Creating, Organizing, and Using Knowledge for Innovation**

Product innovation depends heavily on developing and applying knowledge in three distinct domains:

- (1) About markets and customers,
- (2) About product and process technology, and
- (3) About the organization's own core operating abilities.

Aspects of all three kinds of knowledge must be connected in the specific product's design and business plan, in the guiding strategy for the business, and in the organization's policies and procedures governing technology, manufacturing, and other major systems in its value chain. How well

organizations can develop each domain fully and integrate all of them would have a lot to do with how well they can innovate. Customer and Market Knowledge: First, the largest single cause of new product failure is the failure to understand customer needs (Rothwell et al 1974; Cooper 1983; 1988). To put it more positively, successful new products have more market knowledge than failed ones (Souder 1987; Mohrman 1996). However, customer needs for new products are difficult to articulate and sort out, because the customers themselves may not be sure, the knowledge itself is often tacit, and that knowledge may be embedded in a context of use and not retrievable except by hands-on interaction with that context (von Hippel 1994). Customer needs may change in any case as the product is used (Rosenberg 1982). Despite these difficulties, the more details on various needs and attributes from customers the better for a product's ultimate success (Bacon et. al, 1995).

This should make sense, since any product is in fact a complex bundle of components, attributes, and specifications, and the more the many design and engineering choices that go into its construction are based on actual customer priorities and preferences, the better (Griffin and Hauser 1993 on QFD, a technique based on the generation of at least 200 specific need

statements, and Leonard-Barton 1991 on empathetic design, or extensive interaction and prototyping with users).

These deep, “visceral” insights on the customer and the context of use must be complemented with knowledge from other levels of analysis (Dougherty 1992). Assessments of the size of the market, likely segments, how quickly is the market is likely to evolve, and what are the key underlying drivers of that evolution are essential, as knowledge of more general trends in demand, government regulations, competition, and complementary products that might affect the size and growth rates of the potential market (Gatignon and Robertson 1985). As well, organization members must understand the products’ connection to existing product lines and brands, since a bad fit can stretch abilities or damage the reputation of the firm, but too close a fit can keep the organization from appreciating new opportunities (Christensen and Bower 1993). None of these levels and aspects of customer/market knowledge can be ascertained for sure, but it should be obvious that designing a product with undesirable performance attributes for a small set of potential users who probably won’t change current patterns of use anyway is *not* a good thing.

Technology Knowledge for Product Innovation: Customer knowledge must be complemented with technology knowledge before a product can be



created (Freeman 1982; Cohen and Levinthal 1990). “Technology” is used to refer to science or engineering-based knowledge used to create products and manufacturing processes, such as microbiology, materials science, information systems, software, chemical engineering, or electronics. Like the first domain, knowledge of technology ranges in level from the specific details of a particular technical problem to systems of technologies that may underlie a given product line. Since technologies are often part of a larger system, the ability to solve any particular problem may depend on access to the broader knowledge of the field or discipline, regarding what progress is being made where in solving various puzzles (Freeman 1982; Rosenberg 1982). To access such knowledge, organizations are advised to develop their own technologies systematically, and to create “platforms” of capability so that some of the problems that come up in an evolving product line have already been worked on (Sanderson and Uzumeri 1996). They are also advised to monitor emerging technologies that may ultimately replace theirs (Utterback 1992). However, the ability to grasp these apparently systematic trajectories and interconnections, especially in the earlier phases of a technology's emergence, requires hands-on experience, learning by doing, and extensive informal social networks (Hippel 1988).

## **2.11 Impact of Product Innovation on the performance of manufacturing company**

The impact of product innovation on the performance of company could not be over-emphasized product innovation plays an indispensable role in the performance of a company as stated in its objective. It has contributed tremendously to the growth of the organization in terms of sales and profit. The sales performance of the company has increased over time with the introduction of new product which captures some segment of the company product's market. As a result of increase in sales, the organization's profit also is maximized. Increase in turnover implies increase in profit. Consumers' satisfaction is another key factor to be considered when a new product is developed. Customers whose taste changes over time would enjoy alternative product that satisfies their needs thereby create value to the customers. This has facilitated customers' loyalty. Product innovation may have different impact on the old product in different companies. In some companies, product innovation may lead to the withdrawal of the old product from the market. In some other companies, the old product will be marketed alongside with the new product. This could in a way increase the market share of the company.

## **2.12 Background of Nigerian Bottling Company Plc Kaduna**

Nigeria Bottling company plc, is a bottler of coca-cola, fanta sprite, coca-cola was first made on the 8<sup>th</sup> may, 1886 by Dr, John Styth Perberton, a pharmacist in his town Atlanta Georgia USA. Frank M. Robison assisted Dr. Perberton in the preparation of coca-cola. He also designed the following script that distinguished the famous trade mark.

Coca-cola content remains a secret forever 100 years. The formulate known as MERCHANDISE 7X is kept in a special security valt in a bank in the United States of America. Coca-cola World's leading soft drinks sold on more than 145 countries.

A total of 250 million servings are consumed everyday in all part of the globe from Canada in the North to Argentina and New Zealand in the south from Alaska to China from Mexico to Nigeria.

Coca-cola first came to Nigeria in 1953 when Nigeria Bottling Company set up its first plant in Lagos. Nigerian bottling company is today Nigerians number one bottler of soft drinks selling more than ten million bottles per day.

Ice cold coca-cola cannot be compared with any soft drink, fanta also is far the number one best seller in the orange segment and Krest Bitter lemon, most widely sold lemon lime drinks in Nigeria other product, bottle by

Nigeria Bottling company include fanta lemon, Chapman, fanta tonic, fanta Ginger Ale club soda, Eva water and five Alive and the most recently introduced products are the Zero coke and fanta Apple which are fast selling. The success of coca-cola has brought with the development of number of industries all contributing to the growth of the Nigerian economy, the Delta glass company in Ughelli which supplies the millions of bottles in operation, and the car on product factories in Ijebu-ode and Kano to seal the bottles, the Benin city plastic crates for carrying bottles. It should be noted that Nigerian Bottling company have diversifies into other areas which investment was incurred. The agric seed for farmers located in Zaria, the rice processing at Afuze in Edo state is a part of diversification which Nigerian Bottling Company had invested.

In addition, the trucks which are familiar sight in many parts of the country, deliver soft drinks to more than 65,000 dealers are also assembled in Ibadan Nigeria. Nigeria Bottling Company is also the largest manufacturers of CO<sub>2</sub> in the country used to carbonate, your favourites soft drinks. Nigeria Bottling Company employs over 7,000 Nigerians in all field of operation.

Nigeria Bottling Company Kaduna was established in 1976 under the Northern region. The Kaduna plant is divided into the following division:-

**Administrative Department:** This is headed by the plant manager who control all activities In the plant.

**Finance Department:** This is headed by the finance manager, who handled the cash flow of the plant, signing vouchers and budget preparations.

**Sales Department:** This headed by the plant sales manager who is in-charge of sales, advertisement and promotion of product, the plant sales manager is assisted by other two managers, one is the area sales manager in-charge of the plant sale trucks and Zaria's Depot for proper coordination of activities. These two managers report directly to the plant manager.

**Production Department:** This department is headed by the Bottling Hall manager who is in-charge of bottling all the workshop managers who are responsible for the repairs and the maintenance of all the company vehicles.

**Personnel Department:** This is headed by the plant personnel manager who is in-charge of manpower development of human resources management.

**Engineering department:** This position is headed by an engineer who is responsible for maintenance and repairs of machines and all the electrical installation of the company.

**Quality Assurance Department:** This is headed by quality Assurance manager who is a Biologist in-charge of quality and standard of syrups use in production.

The company is operating three shift syrup to enable exigencies if arises in production. The company structure is such that it is headed by an executive chairman who is Nigerian and a General Manager who is an expatriate. The company is having five regional offices namely Northern region, North –east region, south east region, south-west region and west region each being headed by a Regional General Manager (RGM)

The main objectives of Nigeria Bottling Company is to satisfy the needs of their customers alike in their area of operation namely the production or provision of soft drinks and in the process provide employment and maximize profitability of the enterprise. Quality is the key word, which determines the success of the whole operations, only the very best ingredients are used for making of soft drink with assistance of sophisticated filling and washing equipment installed in all plants. Hygiene is maintained in all plant to ensure top quality product that reach the consumers, presently there about eight plant at Kaduna, Markudi, Jos, Maiduguri, Sokoto, Ilorin, Kano and Katsina.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter deals with the methods and procedures employed by the researcher in gathering data. It explains the tools and methods that were used on the research work. It specifically presents Research design, population of the study, sampling size, sampling techniques, data collection instrument and administration, methods of data analysis and justification of instrument used.

#### **3.2 Research Design**

The research design adopted for this study is survey design. Descriptive survey method is considered more appropriate for collecting, analyzing and interpreting data gathered from respondents (Osuala, 2001).

#### **3.3 Population of the study**

The population of the study consists of all management staff of Nigerian Bottling Company Plc, Kaduna Plant, with a population of 800 staffs, namely; top level management staff, middle level management staff and lower level management staff.

### **3.3.1 Sampling Size**

The sample size of this study is 80 staff, this is in line with Roscoe (1975) 10% Rule of Thumbs which stated that 10% of the given population can be chosen as sample size.

### **3.3.2 Sampling Techniques**

For the purpose of selecting the sample for this study, 80 staff was randomly selected from the population.

### **3.4 Data Collection Instrument and Administration**

The research data were collected with the aid of a questionnaire which is made up of two sections. Section “A” is on demographic characteristics of the respondents which comprises of gender, education qualification, position held and working experience. Section “B” is on research question 1, 2 and 3 respectively, with each containing five items. A five likert scale rating was used to permit decision. Thus, SA- Strongly Agree, A- Agree, UD- Undecided, D- Disagree and SD- Strongly disagree. 80 questionnaires were administered to the respondents in their various departments.

### **3.5 Methods of Data Analysis**

The researcher employed the use of the mean statistic for the data analysis and decision rule was used to take decision. Value (s)  $\geq 3.0$  were considered



as agree and value (s)  $\leq 2.73$  were recorded as disagree. Hypotheses were tested using chi- square ( $X^2$ ).

### **3.6 Justification of the Instrument Used**

The researcher chooses the mean statistic and chi-square method as procedure for statistical analysis for the purpose of accuracy and clarity.

With this method also, data are easily tabulated and useful conclusion can be drawn.

## CHAPTER FOUR

### DATA PRESENTATION AND ANALYSIS

#### 4.1 Introduction

This chapter presents analyses and interprets the data collected from the staff and management of Nigerian Bottling Company Plc, Kaduna that guided this study.

#### 4.2 Data Presentation

Data for this study were presented based on the tables below:

**Research Question 1:** What is responsible for product innovation in your company?

**Table 4.1:** The grand mean of respondents on the need for product innovation

S/N	Statement	Mean ( $\bar{X}$ )	Remark
1.	The company is faced with the challenge of product obsolescence	2.3	Disagree
2.	The company experience shortfall in sales and profit due to competitors' market influence	3.8	Agree
3.	Competitors roll out products that appeal to customers' mind and innovate when necessary	3.7	Agree
4.	The company deem it fit to innovate product to meet up with market needs and challenges	3.6	Agree
5.	It is part of the company's objective to maximize shareholders fund through profit maximization	4.0	Agree

**Source:** Field Survey, 2014.

Table 4.1 shows that the respondents agree with all the items except item 1.

This implies that there is need for product innovation in the company.

**Research Question 2:** How does the company source for strategic plan for new product?

**Table 4.2:** The grand mean of respondents on the source of strategic plan for new product

S/N	Statement	Mean ( $\bar{X}$ )	Remark
6.	The company develop effective marketing research programme	3.4	Agree
7.	It organizes effective employees and stakeholders suggestions and opinions forum	2.4	Disagree
8.	The company assesses direct customers' complaints through the sales force	3.2	Agree
9.	It evaluates competitors market activities and operations	3.0	Agree
10.	The company examines indirectly competitors' information from suppliers	2.0	Disagree

**Source:** Field Survey, 2014.

Table 4.2 shows that, the respondents agree with items 1, 3, and 4 but disagree with item 2 and 5. This implies that source of strategic plan for new product is carried out by the company and its operational staff.

**Research Question 3:** What are the short-term and the long-term impact of product innovation?

**Table 4.3:** The grand mean of respondents on the impact of product innovation

S/N	Statement	Mean ( $\bar{X}$ )	Remark
11.	Product innovation increases company's turnover, profit maximization and enhances customer loyalty	3.6	Agree
12.	It instills modern production technology in employees and enhances their performance	3.4	Agree
13.	It increases the company customers base that is market share of the company	3.0	Agree
14.	Product innovation facilitates maximization of shareholders fund through increase sales and profit of the company	3.1	Agree
15.	Product innovation improves the relationship between the company, other stakeholders and consumers' satisfaction.	2.7	Disagree

**Source:** Field Survey, 2014.

Table 4.3 shows that, the respondents agree with all the items except item 5.

This implies that production innovation enhances the attainment of short-term and long-term objectives and performance of the company.

### 4.3 TEST OF HYPOTHESES

For the purpose of this study the following hypothesis formulated in chapter one were tested.

Ho<sub>1</sub>: Product innovation has impact on the sales of the company.

Ho<sub>2</sub>: Product innovation increases the profit of the organization.

Ho<sub>3</sub>: Product innovation does not have impact on the level of consumers' satisfaction.

**Table:** 4.1 (2), 4.2 (6), 4.3 (11) will be used to test the hypothesis above; level of confidence is 0.05 level of significance. This means that the error term  $\alpha = 5\%$

It implies that the study allows a 5% chance of conclusion being corrected.

Degree of Freedom (df) = (r-1) (c-1)

Testing Statistic  $X^2 = \frac{\sum(O-E)^2}{E}$

Decision Rule: Accept H<sub>1</sub> if computed  $X^2 >$  critical value of  $X^2$

Degree of freedom of table below = (r-1) (c-1)

= (3-1) (5-1)

= 2x4

= 8

### Computation

S/ N	Variables	SA	A	UD	D	SD	TOTAL
2.	The company experience shortfall in sales and profit due to competitors' market influence	30	25	5	10	5	75
6.	The company develop effective marketing research programme	25	20	10	5	15	75
11.	Product innovation increases company's turnover, profit maximization and enhances consumers' satisfaction	30	20	5	10	10	75
		<b>85</b>	<b>65</b>	<b>20</b>	<b>25</b>	<b>35</b>	<b>225</b>

**Source:** Authors Computation, (2014).

### Contingency Table

O - E	O - E	O - E	O - E	O - E
30 20.3	20 21.6	5 6.6	10 8.3	10 11.6
25 20.3	20 21.6	10 6.6	5 8.3	15 11.6
30 20.3	20 21.6	5 6.6	10 8.3	10 11.6
<b>85</b>	<b>60</b>	<b>20</b>	<b>25</b>	<b>35</b>

**Source:** Authors Computation, (2014).

### Computation:

**Key O** = Observed Frequency

**E** = Expected Frequency

**Computation of Chi – Square  $X^2$**

<b>O</b>	<b>E</b>	<b>(O – E)<sup>2</sup></b>	<b><math>\frac{\Sigma(O – E)^2}{E}</math></b>	<b>O - E</b>
30	20.3	9.7	94.09	4.63
25	20.3	4.7	22.09	1.09
30	20.3	9.7	94.09	4.63
20	21.6	1.6	2.56	0.12
20	21.6	1.6	2.56	0.12
20	21.6	1.6	2.56	0.12
5	6.6	1.6	2.56	0.39
10	6.6	3.4	11.56	1.75
5	6.6	1.6	2.56	0.39
10	8.3	1.7	2.89	0.35
5	8.3	3.3	10.89	1.31
10	8.3	1.7	2.89	0.35
10	11.6	1.6	2.56	0.22
15	11.6	3.4	11.56	0.99
10	11.6	1.6	2.56	0.22
				<b><math>X^2 = 16.68</math></b>

**Decision Rule:** Since the computed value of  $X^2$  is 16.68 which is greater than the critical  $X^2$  table value 15.507. Therefore, we accept  $H_{o1}$  and  $H_{o2}$  which states that product innovation has impact on the sales and increases the profit of the organization while  $H_{o3}$  is rejected.

#### **4.4 Summary of Findings**

The findings from this research work are as follows:

1. That lack of product innovation can affect the organization's sales, profit and consumers' satisfaction;
2. That company experience in shortfall of sales and profit is responsible for product innovation;
3. That product innovation has impact on the sales, profit and consumers' satisfaction of the firm;
4. That change in consumers' taste facilitates product innovation.

.



## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Summary

This research brings to light some of the benefits of product innovation, which can be regarded as organization's survival strategy. Product innovation can be described as a situation where product is improved upon to meet the ever-changing needs of consumers, organizational turnover and profit. An "old" product can be placed as a "new" product in the market after making some minor changes. On the other hand, an entirely new product can also be introduced into the market as a result of research findings. Most technology based company innovations are mostly technology-driven contrary to market-driven technology, which is stimulated by the consumers' needs.

Products like any other living beings undergo a normal lifecycle and at every stage of the life cycle, the product experiences some changes in the demand for them. Product innovation can be also be carried out on product already in the market. Also, the research outlines that the company could achieve its short-term and long-term objective through product innovation which would enhance increase in sales, profit maximization and consumers' satisfaction.

## 5.2 Conclusion

In this research paper, the impact of product innovation on the performance of manufacturing company was examined. The background has revealed that most products require innovation due to constant changes in the taste of consumers and the need for company to increase sales and maximized profit.

It appears that philosophy of marketing concept is yet to be taken seriously, most companies reckon with this concept in practice. In the practical sense, the needs and wants of the consumers are satisfied through the company's product(s). For a product to meet these objectives of satisfactions, it must undergo product innovation at regular intervals because of the dynamic nature of consumer's needs and wants that changes over time.

The idea behind product innovation does not end in the satisfaction of changing taste of the consumers, this aspect of product innovation also helps the company to have an edge over competing products in terms of sales. Sales would increase over time because more consumers would be attracted to the new product. Not only would these, product innovation enhance the attainment of profit maximization to the company as a result of increase in turnover. The rate at which consumers patronize such product has facilitated profit maximization.

Finally, it is worthy to note that product innovation is not limited to once in a product's lifetime. A product can be innovated as many times as possible. This aspect of product innovation is mostly done on consumers' goods. This is so because the cost in carrying out product innovation on consumers good is not that high as the amount that will be spent in carrying out innovation on industrial goods.

### 5.3 **Recommendations**

Having undertaken a thorough study of the impact of product innovation on the performance of manufacturing company, it is deemed necessary to give some useful suggestions and recommendations, which would help in improving the quality of consumer goods and improving the satisfaction of consumers. The recommendations are as follows:

1. Companies should engage in extensive research, to find out the actual needs of the consumers in relation to what should be produced. This would go a long way in preventing the production of products which are not actually needed because of its failure to satisfy the needs and wants of the consumers;
2. In addition, companies should carry our research on the changing taste of the consumers periodically so as to adjust the already existing

product, to meet the dynamic taste of consumers because failure to do so would reduce the product sales and profit;

3. Since product innovation helps in reducing cost of consumer goods, Nigerian Bottling Company management should engage in it at regular interval so as to cut down the cost of value analysis strategy which is segment of product innovation;
4. Management of Nigerian Bottling Company should ensure that Research and Development Department as well as feedback of consumers from sales personnel where new product strategic plan emanated from should be explored and made use of so as to enhance provision of products that are expected by consumers. Such report includes that from sales persons who are always in touch with the consumers and understand most of the competing products and in addition they know the position of their company's product in terms of competition in the market;
5. Finally, in carrying out product innovation, management of Nigerian Bottling Company should ensure that the "new" product is real improvement on the old one. Consumers should not just be deceived that a product quality has improved while in the actual sense, there is no alteration on the product.

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## **APPENDIX**

### **DEPARTMENT OF BUSINESS ADMINISTRATION FACULTY OF MANAGEMENT SCIENCES USMANU DANFODIYO UNIVERSITY, SOKOTO**

Dear Respondents,

I am a student of the above department undertaking a research on the topic “Impact of Product Innovation on the Performance of Manufacturing Company (A Case study of Nigerian Bottling Company Plc, Kaduna)”.

This questionnaire is to help me acquire the necessary information for the purpose of project writing.

Kindly express your opinion by responding the attached questionnaire. Your responses will be treated in strict confidence and only for the purpose of this study.

Thanks for your co-operation

**Raji Abdulyekeen Abubakar**



**INSTRUCTION:**

Please tick (✓) the appropriate box in section A below. Respond to section B research Question 1, 2 and 3 base on your suitable opinion, using SA = Strongly Agree, A = Agree, UD = Undecided, D = Disagreed and SD = Strongly Disagreed.

**SECTION A:**

1. Gender: Male [  ] Female [  ]
2. Education Qualification NCE/ND [  ] HND/B.Sc [  ] MBA/M.Sc. [  ]
3. Position Held: Top Manager [  ] Middle Manager [  ] Junior Manager [  ]
4. Working Experience: 1 years – 2 years [  ] 3 years – 5 years [  ]  
5 years – 10 years [  ]

**SECTION B****Research Question 1:**

**What is responsible for product innovation in your company?**

S/N	Statement	SA	A	UD	D	SD
1.	The company is faced with the challenge of product obsolescence					
2.	The company experience shortfall in sales and profit due to competitors' market influence					
3.	Competitors roll out products that appeal to customers' mind and innovate when necessary					
4.	The company deem it fit to innovate product to					

	meet up with market needs and challenges					
5.	It is part of the company's objective to maximize shareholders fund through profit maximization					

**Research Question 2:**

**How does the company source for strategic plan for new product?**

<b>S/N</b>	<b>Statement</b>	<b>SA</b>	<b>A</b>	<b>UD</b>	<b>D</b>	<b>SD</b>
6.	The company develop effective marketing research programme					
7.	It organizes effective employees and stakeholders suggestions and opinions forum					
8.	The company assesses direct customers' complaints through the sales force					
9.	It evaluates competitors market activities and operations					
10.	The company examines indirectly competitors' information from suppliers					

**Research Question 3:****What are the short-term and the long-term impact of product innovation in your company?**

<b>S/N</b>	<b>Statement</b>	<b>SA</b>	<b>A</b>	<b>UD</b>	<b>D</b>	<b>SD</b>
11.	Product innovation increases company's turnover, profit maximization and enhances consumers' satisfaction					
12.	It instills modern production technology in employees and enhances their performance					
13.	It increases the company customers base that is market share of the company					
14.	Product innovation facilitates maximization of shareholders fund through increase sales and profit of the company					
15.	It improves the relationship between the company, other stakeholders and customer loyalty					