

# ***THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT***

## **An Evaluation of the Effect of Technological Innovations on Corporate Performance: A Study of Selected Manufacturing Firms in Nigeria**

**Nwosu, Hyginus Emeka**

Research Fellow, Department of Business Administration, Faculty of Management Sciences  
Anambra State University, Southeast Nigeria

**Awurum, Juliet Ifeoma**

Tutor, Federal Polytechnics Mubi, Adamawa State, Northeast Nigeria

**Okoli, Ifeanyi Emmanuel**

Research Fellow, Nnamdi Azikiwe University, Awka, Anambra State, Southeast, Nigeria

### **Abstract:**

*This study appraises the effect of technological innovation on performance of Nigeria manufacturing firms. The purpose of the study is to determine whether there is technological innovation in some performing manufacturing firms in Nigeria and the extent it has contributed to their performances. The population of the study is 8725 being the total staff strength of ten manufacturing firms spread across ten sub sectors of manufacturing sector in Nigeria Stock Exchange while the sample size was extracted from the population using Taro Yameni method. Structured questionnaire was used to generate the primary data. The study used descriptive type of survey design while t-statistics was adopted for hypotheses testing. The result of the study revealed that Process innovation has significant positive effect on the performance of manufacturing firms ;that Product Innovation has significant positive effect on the performance of manufacturing firms; that Organizational structure has significant positive effect on the performance of manufacturing firms; and that employee development significantly affect firm's performance positively. In view of the above findings, the study concludes that even though most firms in the manufacturing sector are not performing, the result from selected few performing manufacturing firms used in this study attest to presence of technological innovation which is a critical success factor behind their success. The study therefore recommends that Nigeria manufacturing firms should give more serious attention to technological innovation, endeavor to lay more emphasis on employee development as it is an indispensable factor that facilitates technological innovation and that manufacturing firms should adopt appropriate structure because appropriate structure provides a solid foundation for company's operation and technology.*

**Keywords:** *Technological innovation, process innovation, product innovation organizational innovation, corporate performance*

## **1. Introduction**

### **1.1. Background of the Study**

Often when the word technology is mentioned, what readily comes to mind are machines and other equipments used in production, but technology is much more than this; it refers to the sum total of knowledge or ways of doing things. Technology includes inventions, techniques and the vast store of organized knowledge about everything from aerodynamics to zoology (Kontz et al, 1981). Perrow (1965) define technology as a technique or complex of techniques employed to alter material (human or non human, mental or physical) in an anticipated manner. Technologies can only lead to increased productivity or improve performance when combined effectively with other resources like human resources (Dauda & Akingbade, 2011). 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 changing 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.

Due to strategic nature of technology, Organization's strategists constantly scan the environment for technological changes that may significantly affect their organization's operations, performance and survival. Technological changes in this sense will include changes in raw materials and the equipment used for production. Such strategists realize that changing technology can offer opportunities for improving objectives attainment or threatens the existence of the firm (Glueck and Jauch, 1972). Most organization tends to undermine the effect of technological innovation, the outcome and price for such action is low profitability and performance or even liquidation for such organizations.

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.

There is a growing concern that technological innovation alone is not enough to make renewal of organization's success hence the imperative of non-technological factors to foster economic growth. Non-technological factors are for instance high performance work systems and new ways of working that will match existing and modern technology. It builds on "old school" socio-technology and human relations thinking, stating that the success of technological innovation is contingent on innovation of the social system. Such non-technological innovations are interchangeably termed "organizational innovation" (Hage, 1999; Lam, 2004), "workplace innovation" (Totterdill, 2010; Pot, 2011; Dortmund/Berlin Position Paper, 2012), and "social innovation in the workplace" (EU DG Enterprise and Industry, 2012; Eeckelaert et al., 2012; Pot, Dhondt & Oeij, 2012). These innovations are not the end products (new products or services), nor the R&D expenditures, but deal with renewal and improvement of the deployment/development of people (employee development), management, HR, organizational structure, marketing method. Because there is no strict definition available, such non-technological innovations are often termed "organizational" or "workplace" innovations (e.g. Hage, 1999; Lam, 2004; Armbruster, Bikfalvi, Kinkel & Lay, 2008) or, especially in the Netherlands, "social innovation" (Pot & Vaas, 2008a, 2008b; Pot & Koningsveld, 2009; Pot, 2011; Oeij, Dhondt & Korver, 2011b). Pot (2011) defines workplace/organizational innovation as the implementation of new and combined interventions in the fields of work organization, HRM and supportive technologies. Workplace innovation is considered to be complementary to technological innovation. Pot stresses new and combined interventions, by which "new" is understood as "innovation" and "combined" as a bundle of measures referring to work organization, Human Resource Management and supportive technologies.

This paper therefore investigates the effect of technological innovations and supporting technologies with a view to determine the extent it has helped the performance of firms in manufacturing sector of Nigeria economy. The remainder of this paper is organized as follows: section 2 discusses the related literatures; section 3 is the research methods, section 4 presents the results and discussion of findings while section 5 is conclusion and recommendations.

### *1.2. 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 but 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 dismal performance over the years. All indicators of performance for the sector are negative. Capacity utilization which is a very good measure of performance for the sector has been alarmingly low over the years. As at 1977, capacity utilization in the sector stood at all time high of 78.8 percent, it was down to an all time low of about 29.3 percent as at 2004, (CBN, 2004). Although there was a significant change from 1996 all time low, it is still far below expectation. The Nigeria manufacturing sector has not been able to contribute significantly to the economic development of the country as indicated by its contribution to the nation's GDP. In 2007, its contribution to GDP was a paltry 7.4 percent (MAN, 2008). The high rate of mortality in the sector clearly highlights the inability of the sector to cope with its challenges especially technological challenges. According to Jide (2006), over 750 firms in the sector have closed down in the recent past and many more face the prospect of imminent collapse in the near future. As at 2006, a survey by MAN shows that 30 percent of the sector were classified as closed down, 60 percent were ailing while only 10 percent were operating at sustainable level (MAN, 2006). Currently, Nigeria revealed rebased gross domestic product (GDP) figures for 2013 showed an 89 percent jump in the estimated size of its economy yet the manufacturing sector which ought to be the driving force of developing economy like Nigeria is lagging behind. The new rebased data show that the size of the Nigerian economy is estimated at N80.3 trillion (\$510 billion) as at 2013, Yemi Kale, Head of the National Bureau of Statistics (NBS), said at a press conference to announce the results in Abuja. The new figures show that Nigeria has surpassed South Africa as the largest economy in Africa and 26<sup>th</sup> in the world after overhauling its GDP data for the first time in two decades.

The 2013 rebased figures showed that agric sector contributed 21.97 percent or N17.625 trillion (\$112.26 billion) of the total N80.22 trillion (\$510 billion). The real estate sector contributed 8.01 percent to the Nigerian economy equivalent to N6.43 trillion (\$40.9 billion) of the total rebased GDP estimate of N80.22 trillion (\$510 billion). Crude petroleum and natural gas which comes under the mining and quarrying sector contributed 14.4 percent or N11.55 trillion (\$73.56 billion) to the total 2013 rebased GDP. The telecommunications and information services sector contributed 8.68 percent to the Nigerian economy equivalent to N6.97 trillion (\$44.3 billion) out of the total rebased GDP estimate of N80.22 trillion (\$510 billion). While the manufacturing

sector of the economy contributed 6.81 percent to the new GDP data equivalent to N5.47 trillion (\$34.8 billion) out of the total 2013 GDP rebased estimate of N80.22 trillion (\$510 billion).

In the last few years, the manufacturing sector has not witnessed significant improvement as the capacity utilization revolves between 35% and 40%. Its contribution to the Gross Domestic Product (GDP) as at 2014 was 6.81%, while the growth rate is 7.86%. This is considered too low for a country that has huge consumption power like Nigeria; having an estimated market size of about 170million. It had been pointed out earlier on 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 using obsolete production technology.

However, despite low performance rate and high rate of mortality in the sector, there are some firms that are performing well using all performance indices. These performing firms need to be reassessed with empirical substantiations to ascertain whether technological innovation is actually behind their success. It had therefore been pointed out that for high efficiency and product quality which are imperatives for competitiveness, better performance and survival, there is the need for substantial investment for modernization of existing facilities and in advanced technology. The enhancement in technology should go together with non-technological innovation. Technological innovation alone is not enough to make renewal of organizations work hence the imperative of non-technological factors to foster economic growth. Product and process innovation only lead to higher productivity when performed in combination with organizational innovation (Polder et al., 2010).

This paper is of the view that responds to technological change and Innovation influences corporate performance, therefore it is not out of place to investigate the extent to which manufacturing firms in Nigeria responds to change and advancement in technology in addition to organizational innovation. Technological advancement is important factor for influencing the improvement of performance (Hitt et al., 1997). Studies like (Foster, 1986 & Polder et al, 2010) have shown a positive relationship between a firm's technological advancement and performance, and concluded that technological advancement is important for employee performance. This paper intends to establish whether performance of firms in manufacturing sector is affected by technological innovation and advancement.

### 1.3. Objectives of the Study

Considering the above problems besieging the manufacturing sector in Nigeria, the main thrust of the study is to examine the effect of technological innovation on the performance of manufacturing firms. The specific objectives include:

1. To determine the effect of process innovation on the performance of manufacturing firms in Nigeria.
2. To ascertain the effect of product innovation on the performance of manufacturing firms in Nigeria.
3. To appraise the effect of organizational structure on the performance of manufacturing firms in Nigeria
4. To examine the nature of relationship between employee innovation and performance of manufacturing firms in Nigeria.

### 1.4. Research Questions

This study seeks cogent answers to the following research questions:

1. To what extent does a process innovation affect performance of manufacturing firms in Nigeria?
2. What is the effect of product innovation on the performance of manufacturing firms in Nigeria?
3. To what extent does organizational structure affect performance of manufacturing firms in Nigeria?
4. What is the nature of relationship between employee's innovation and performance of manufacturing firms in Nigeria?

### 1.5. Hypotheses

In order to achieve the above objectives, the researcher formulated the following null hypotheses:

- $H_{01}$ : Process innovation does not have significant effect on the performance of manufacturing firms in Nigeria.
- $H_{02}$ : Product innovation has no significant effect on the performance of manufacturing firms in Nigeria.
- $H_{03}$ : Organizational structure has no significant effect on the performance of manufacturing firms in Nigeria
- $H_{04}$ : Employee's innovation has no significant effect on the performance of manufacturing firms in Nigeria.

## 2. Review of Related Literature

### 2.1. Conceptual Review

Innovation is derived from the Latin word novus, meaning new. It is defined as "introduction of something new" or a new idea, method or device (Tornatzky and Fleischer, 1990). Technological innovation is considered as a process which is science, technology and system based. This process includes several factors affecting and affected by the firm's internal capabilities, its networking and its technological learning ability and influenced by its environmental factors. It would mobilize all existing potential resources to augment the firm's innovation capacities, ending with the introduction of a new or better product and/or production process.

Ayres (2008) identified technology as the wealth of companies while Kamzi (2003) in his view sees technology as consisting of those factors that are related to the knowledge applied and materials and machine used in the productions of goods and services which have an impact on the business of the organization. It refers to all the methods available to an organization for converting resources into products and services (Griffin, 1996). Onwuchekwa(1993) submits that environment and technology determine the three basic flows of activities in a business organizations namely, input, throughput and the output activities achievements or threaten the existence of the firm (Glueck and Juack, 1984) while Imaga (2003) posits that technology is conceived as a possibility package of institution, which could be managed or mismanaged with varying degree of success and failures. It also refers to all

methods available to an organization for converting resources into products and services (Griffin, 1996). Onodugo (2000) sees technology as the methods and techniques employed in productive activities.

Technology changes as a result of breakthroughs in research and development. Technology is one of the key elements that define a society or civilization. The critical role of technological innovation in the development of a company and its contribution on the economic growth of firms has been widely documented. According to Abernathy and Utterback, (2005) the primary role of technological innovation is to assure the survival of the entity, as well as the business ecosystem, which in turn is based on achieving sustainable financial performance. Technological innovation has enormous influence on employee performance (Nohria and Gulati, 1996).

However, technological innovation is the process of combining and reorganizing knowledge to generate new ideas. Mumford (2000); Huselid (1995) & Hitt et al (1997) argue that the development of technology has an impact on firm performance, So there is a close relationship between technological innovation and employee performance. Innovation makes employees more effective and firm more efficient (Lawless and Anderson, 1996). Technological advancement can improve firm performance as well (Li and Deng, 1999). There is the need for both technological and organizational innovation for better organizational performance and survival.

Dauda & Akingbade, (2011) argue that technologies can only lead to increased productivity or improve performance when combined with other resources effectively by human resources. Employee can rapidly acquire new knowledge and further advancement competencies through training (Chi et al., 1989). Employee's performance is closely linked with technological advancement. Technological advancement can be managed effectively through employees. Resource-based theory suggests that a firm's resources are extremely important for the firm's development, and that human capital is a key resource of a firm. Technological advancement is important factor for influencing the improvement of performance. Studies like Hitt et al. (1997) & Hitt et al., (1997) have shown a positive relationship between a firm's technological advancement and performance, and concluded that technological advancement are important for employee performance.

Gerstenfield and Wortzel (2007) suggested that one of the requirements for economic and industrial development of Organizations is their ability to innovate successfully. According to Tefler (2002), a company must innovate or die, the process of innovation is fundamental to a healthy and viable organization. Those who do not innovate ultimately fail. Hill and Utterback (2009) identified technological innovation as a major agent of development and change in societies which has been linked to rising productivity, employment growth and a strong position in competitive markets, trade and improved quality of life. However, the inherent complexity of the process of technological innovation and its involvement in interaction with different environmental as well as industry-specific factors, made studies of the characteristics of technological innovation seem difficult to carry out. However, Lall (1980) stressed that a significant amount of technological innovation is taking place in the modern sectors of developing countries, particularly in those with relatively long experience of manufacturing and with broad-based capital good sectors. To Lall, these innovations include changes in broad sense. They encompass increase in productivity and efficiency from simple learning by doing, advances in the designing, constructing and managing complex and advanced industrial processes and a manifestation of the ability to innovate technologies in the areas of medium to high. On the relationship between technology and business activities, Tanja et al (2012) found a positive relationship between enhanced technology and business performance. Adam & Farber (2000) also in his study concludes that in the organizational context, technological innovation may be linked to performance and growth through improvements in efficiency, productivity, quality, competitive positioning and market share, among others. They also found that technological innovation is positively related with performance. Research by Imran et al (2014) investigates the impact of technological advancement on performance and finds that technological advancement has significant impact on motivation and training of employees. The study further concludes that motivation has significant impact on employee performance but training has no significant impact on employee performance. Moreover as the concerned for technological advancement and employee performance, there is significant relationship between them.

Innovation is also classified in two types as radical and incremental, according to its degree (Dewar and Dutton, 1986). Some scholars also discriminate technological innovations covering process and product types from non-technological innovations covering marketing and organizational innovations. This study noted the classification of four types of innovation described in the Oslo Manual (OECD and Eurostat, 2005) as product, process, organization and marketing innovations. Basically organizations are concerned with major types of technology namely process and product technology. Product technology are concerned with how products are designed while process technology is concerned with how products are manufactured and delivered to customers (Tate and Taylor, 1983).

This study align with the disposition of Polder et al., (2010) who submit that Product and process innovation only lead to higher productivity when performed in combination with organizational innovation hence we development of the model below.

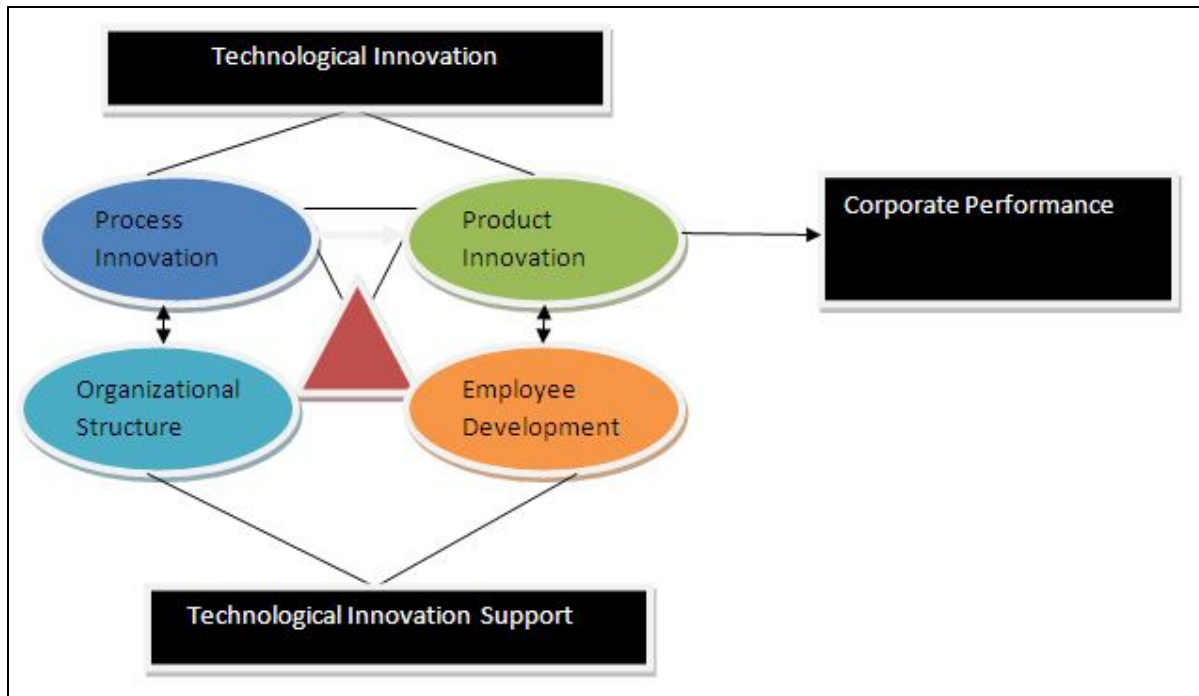


Figure 1: Technological Innovation and Corporate Performance Framework  
Source: Researcher's Design 2015

### 2.1.1. Process Innovation

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 (e.g. installation of new or improved manufacturing technology, such as automation equipment or real-time sensors that can adjust processes, computer-aided product development). Process Innovation can be described as improving or changing current procedures and techniques used in the production of products. Any improvement to current manufacturing, delivery, packaging, marketing, project management can be considered a process innovation. Process innovation means improving the production and logistic methods significantly or bringing significant improvements in the supporting activities such as purchasing, accounting, maintenance and computing (Polder et al., 2010). Process innovation includes bringing significant improvement in the equipment, technology and software of the production or delivery method. Firms bring novelties in the production and delivery method to bring efficiency in the business. The new method must be at least new to the organization and organization had never been implemented before. The firm can develop new process either by itself or with the help of another firm (Polder et al., 2010). Firms bring process innovation to produce innovative products and amendments are also brought in the processes to produce the new products (Adner & Levinthal, 2001). To decrease the production cost, firms go for process innovation. The process innovation is reflected in the cost of the product (Olson et al. 1995). Firms adopt new process to compete with other firms; they have to bring the process innovation to satisfy their customers. The process innovation, especially in the manufacturing organizations, can have significant impact on the productivity of the firms. The historical case studies showed that bringing automation in the production methods has increased the efficiency and productivity of the organizations (Ettlie & Reza, 1992)

### 2.1.2. Product Innovation

A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. However, product innovation forms the core of innovative organization and offers incredible competitive advantage in new as well as established markets. Although related to process innovation, product innovation is much more of a process than a single implementation or improvement. Product innovation is often a shot in the dark with the hope of hitting the right market with the right product at the right price. Product innovation means introducing the new products/services or bringing significant improvement in the existing products/services (Polder et al, 2010). For product innovation, the product must either be a new product or significantly improved with respect to its features, intended use, software, user-friendly or components and material. The first digital camera and microprocessors are the examples of the product innovation. The aim of product innovation is to attract new customers. Firms introduce new products or modify the existing products according to needs of the customers (Adner & Levinthal, 2001). Shorter product life cycle of the products forces the firms to bring innovation in the products (Duranton & Puga, 2001). In the competitive environment firms bring product innovation to compete in the market. Change in design that brings significant change in the intended use or characteristics of the product is also considered as product innovation (OECD, 2005). Firms bring product innovation to bring efficiency in the manufacturing process (Polder et al. 2010). Product innovation is customer's need oriented. In highly competitive

environment of today, firms have to develop new products according to customer's needs (Olson et al,1995). The product innovation face the low competition at the time of introduction and that is why it earns high profit (Roberts, 1999). Ettlíe & Reza (1992) stated that firms bring product innovation to compete with other firms in the markets. Firms bring product innovation to satisfy their customers. Product innovation is reflected by the functional performance (Olson et al, 1995). Product innovation is one of the key factors that contribute to success of an organization. New product development and product innovation is an important strategy for increasing the market share and performance of business. Studies by Ettlíe & Reza (1992) showed that new product development has positive impact on the performance of the firm.

### 2.1.3. Organizational Structuring

Technology is a major factor considered in planning and also in structuring organization (Kontz, 1981). Organizational structure according to Nnabuife(2009) deals with setting up a structure or mending an already existing one to suit the organizational environment and the demands of technology. In view of Nnabuife a change in technology must prompt a change in structure. Organizational structure also referred to as organizational design provides a solid foundation for company operations by laying out the physical grouping of employees and the managerial hierarchies within an organization. Organizational structure essentially provides a guide for the way in which work is to be completed within the organization by determining how task, decision and information flow into the company. Organizational structure translates the goals and desires of business leaders into actual, tangible plans. Organizational design can serve as an element of a strategic plan to accomplish specific objectives since organizational structure influences the way in which work flows in a company. Therefore different structure can help or hinder different technology and also can aid or hinder employees in their role. For organization to deliver its plan, the technology and the structure must be woven together seamlessly. A company's structure must support its technology. There is hardly an organization that does not have profit and growth as its main objectives. The growth of a firm is principally measured on the percentage of market share captured and client served. By deciding how to approach the markets and Customers, employees are place into different strategic positions to execute the strategies established by the organization which includes implementing the adopted technologies hence organizational structure is actually integral of strategic planning which technology is an indispensable factor. Weir (1995) in his effort to establish the relationship between organizational structure and corporate performance concludes that firms that adopted appropriate structure yield higher profits than those that do not.

### 2.1.4. Employee Development

Technological innovation and employee's development are essential ingredients of productivity. It is necessary for organizations to continuously embark on technological innovation and employee development to enable them cope with emerging technologies. Any organization that intends to remain viable in the present day global economy has no other choice than to be innovative and invest heavily on employee development and technology (Szell, 1992). Gup & Singhal (1993) suggest that organizations that would like to be creative must ensure that they take care of their human resource, and that people not only products are innovative major assets.

Employee development is a joint, on-going effort on the part of an employee and the organization for which he or she works to upgrade the employee's knowledge, skills, and abilities. Successful employee development requires a balance between an individual's career needs and goals and the organization's need to get work done. Employee development programs make positive contributions to organizational performance as it align the capability of employee with the demand of technology. Business environment is getting increasingly vibrant, corporate growth, rate and size is critical, and values are changing which offer superior business opportunities with change in technology. To commence such a complex process it is necessary to understand the challenge well in advance and act with obligation. Focus should be on performance as well as potential keeping in view the convenient challenges. Organizations must endeavor to investment in employees' development to acquaint the workforce with the demand of technology.

### 2.1.5. Financial Performance

Performance is the outcome of all of the organization's operations and strategies (Wheelen and Hunger, 2002). Measuring financial performance accurately is critical for accounting purposes and remains a central concern for most organizations. Performance measurement systems provide the foundation to develop strategic plans, assess an organization's completion of objectives, and remunerate managers (Ittner and Larcker, 1998). Financial performance is essential to the survival of firms in the competitive and uncertain environment. Financial performance is conceptualized as the extent to which a firm increases sales, profits, and return on equity. These are indicators of financial performance and manifest the wellbeing of a firm collectively (Barnett and Salomon, 2006). Traditionally, the financial performance of firms has been measured using a combination of conventional accounting measures and risk and return measures. Further analysis of financial performance has used methodologies such as financial ratio analysis, benchmarking, measuring performance against budget or a combination of these Financial statements published commonly include a variety of financial ratios designed to give an indication of the institution's performance ( Westphal, 2006 & Wilkinson, 2003).

## *2.2. Theoretical Framework*

This work hinges on the theory of diffusion of innovations. The theory of diffusion of innovation is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through culture. Everett Rogers, a professor of communication studies, popularized the theory in his book *Diffusion of Innovations*; the book was first published in 1962. 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. The origins of the diffusion of innovations theory are varied and span multiple disciplines. Rogers proposes that four main elements influence the spread of a new idea: the innovation itself, communication channels, time, and a social system. This process relies heavily on human capital. The innovation must be widely adopted in order to survive.

**3. Research Methodology**

Research methodology deals with the overall research plan and basic design guiding the process of data collection, collation and procedure necessary for operationalization of research. Therefore, of utmost importance to a Researcher is the methodology. Methodology according to Cohen & Cyert (1972) is the range of approaches used in a research to collate data, which forms the basis for inference and interpretation, and for explanations and predictions. However, there are two common research methods (qualitative and quantitative), each method has its own pros & cons. Any of them approach can be implemented to execute a research. Another famous and most used research approach is to combine both quantitative and qualitative to congregate aims and purpose of the research in a more inclusive way (Prasad, 2005). Yin (1994) predicted that in future, most researches will have combine methods rather than one. Bringing both facts together (qualitative and quantitative) will be exceptional strength of the case study method (Yin, 1994).

*3.1. Research Design*

Research design according to Eheduru (1995) is the specification of method and procedure for acquiring the information needed for the research. This study used descriptive type of survey design. Descriptive survey research design is the systematic collection of data in standardized form from an identifiable population or representative (Oso & Onen, 2009). This design was adopted for this study because it intensively described and analyzed the role of technological innovations on performance of manufacturing firms in Nigeria.

*3.2. Population of the Study*

The population for the study is made up of the total staff, including executive and non executive directors of ten firms quoted on Nigeria Stock Exchange, selected each from ten sub-sectors of manufacturing sector. The ten firms used in the study are listed in table 1 below.

S/N	Names of Firms (PLCs)	Sector	Staff Population
1.	Cadbury	Product Diversified	1471
2.	Nigeria Breweries	Beverages/Brewers	3224
3.	Vita foam	Household Durable	621
4.	Ashaka Cement	Building Materials	653
5.	Unilever	Household Product	1240
6.	UTC	Food Products	581
7.	Cutix	Electronics/Electrical	171
8.	Union Diagnostics	Health Care	143
9.	MCNICHOLLES	Consumer Goods	154
10.	Glaxosmithline	Pharmaceuticals	467
	<b>Total</b>		<b>8725</b>

Table 1: Population of the study  
Source: Field Survey, 2015

*3.3. Sample and Sampling Technique*

Sample is the part of the population diocese for the study. The study will apply Taro Yamani formula to get the sample size. The population is 8725. Since the population is known and has a large number that runs into thousands, Yamani (1964) is most appropriate in determining the sample size. According to Yamani (1964), the following formula was used to determine the sample size where the population is known.

$$\begin{aligned}
 \text{Sample size (n)} &= \frac{N}{1+N(e)^2} \\
 N &= \text{population} \\
 n &= \text{sample} \\
 e &= \text{Degree of tolerable errors (5\%)} \\
 1 &= \text{Constant} \\
 n &= \frac{N}{1+N(e)^2} \\
 n &= \frac{8725}{1+8725(0.05)^2}
 \end{aligned}$$

$$n = \frac{8725}{1+21.8}$$

$$n = 383$$

### 3.4. Validity of Instrument

The Instruments were submitted to five handpicked experts in the field of Operations management. The experts were asked to review the items in the instrument and determine whether the items would measure the information it was designed to elicit. After some minor modifications, the experts recommended the use of modified instrument for the study. The recommended version was subjected to further validation with Rotated component matrix which retained the entire questionnaire since each value is greater than 0.35 in each row.

### 3.5. Reliability of the Instrument

Reliability of the research instrument is with a view to ascertaining its sustainability for the study. The concept of reliability refers to the tests about the degree to which the study instrument perfect the desired measurements when applied to the desired objectives. Akuezuilo et al (2002) opine that a test is reliable to the degree that it measures accurately and consistently, yielding comparable results when administered many times. The instrument was further subjected to Cronbach's alpha. All variables are reliable since their Cronbach's alpha is greater 0.5.

### 3.6. Procedure and Techniques

The data gathered were carefully analysed with various statistical tests with the aim of providing solutions to the research problems as well as validate or invalidate the research hypotheses. The collected data were described by making use of descriptive statistics, which enabled the researcher to synthesize and summarise the quantitative data. The descriptive statistics described the sample in terms of the responses to the questions using frequencies, means and standard deviations. Frequencies are the number of times a response has occurred (Salkind, 2000), a mean is the sum of a set of scores divided by the number of scores and a standard deviation measures variability around the mean (Salkind, 2000). In other words, that mean is obtained by adding all the observations and dividing the sum by the number of observations.

## 4. Data Presentation, Analysis and Discussion of Findings

The data collected are presented by means descriptive statistics to make them amenable for further analysis which include the hypotheses testing. By analysis, we mean the act of making relationships and aggregating data or variables with similar characteristics or attributes and also splitting the units into their parts or component (Stanley et al, 1992). This study accepts the contention of Podssoff et al (1986) that data will be used as a basis for reasoning and deduction. It is also going to be a basis for writing up discussion of findings, recommendations and conclusion. Three hundred and eighty seven (383) copies of the questionnaire were distributed to the respondents. Out of this number, three hundred and twenty five (325) representing 85% response rates were correctly filled and returned while thirty three (33) copies representing 8% were not returned. However, twenty five (25) copies representing 7% were returned but not correctly filled and therefore rejected. The implication is that the analysis of data will be based on three hundred and twenty five (325) representing 85% that were returned and correctly filled. The response rate and the proportion that was used for analysis were considered to be satisfactory

### 4.1. Descriptive Statistics

#### 4.1.1. Process Innovation

S/N	Investigative Items	N	Minimum	Maximum	Mean	Std Deviation
1.	Process innovation improves production and delivery method	325	2	5	3.7861	1.13211
2.	Process innovation entails changes in techniques and equipment	325	2	5	4.4127	.78455
3.	Process innovation enhances manufacturing and performance	325	3	5	4.2825	.87133
4.	Process innovation lead to decrease in production cost and enhances productivity	325	2	5	3.7463	1.14513
5.	Process innovation encourages competitiveness	325	3	5	4.4266	.76112

Table 2: Descriptive Statistics for Process Innovation  
Source: Researcher's field survey result, 2015



Responses from the table 2 above show the descriptive statistics on process innovation. The respondents supported all the propositions raised on this variable. On 5-point scale, the mean score for the entire construct ranges from 3.7463 to 4.4266. This shows a positive response from respondents on the item being investigated.

#### 4.1.2. Products Innovation

S/N	Investigative Items	N	Minimum	Maximum	Mean	Std Deviation
6.	Product innovation improves technical specification	325	2	5	3.5611	1.08511
7.	Product innovation means introduction of new product or significantly improved new one	325	2	5	4.4823	.80745
8.	Product innovation brings customer's satisfaction	325	3	5	3.7686	1.13433
9.	Product innovation bring efficiency and increase performance	325	2	5	3.4322	1.08733
10.	Product innovation assures success and organizational survival	325	3	5	4.4721	.82211

Table 3: Descriptive Statistics for Products Innovation  
Source: Researcher's field survey result, 2015

Responses from the table 3. above show the descriptive statistics on product innovation. The respondents supported all the propositions raised on this item. On 5-point scale, the mean score for the entire construct ranges from 3.4322 to 4.4823. This shows a positive response from respondents on the item being investigated.

#### 4.1.3. Organizational Structuring

S/N	Investigative Items	N	Minimum	Maximum	Mean	Std Deviation
11.	Structure and technology must align seamlessly.	325	2	5	4.3705	.80453
12.	Organizational structure can aid or hinder technology depending on its appropriateness.	325	3	5	3.4315	1.02311
13.	A company's technology must always be supported by its structure for effectivity.	325	3	5	4.3767	.81352
14.	Appropriate structure enhances organizational performance	325	2	5	3.7645	.96455
15.	Appropriate structure increases productivity and efficiency.	325	3	5	3.4545	1.01561

Table 4: Descriptive Statistics for Organizational structuring  
Source: Researcher's field survey result, 2015

Responses from the table 4. above show the descriptive statistics on structure. The respondents supported all the propositions raised on this item. On 5-point scale, the mean score for the entire construct ranges from 3.4315 to 4.3767. This shows a positive response from respondents on the item being investigated.

#### 4.1.4. Employee Development

S/N	Investigative Items	N	Minimum	Maximum	Mean	Std Deviation
16.	Employee development and technological innovation are very essential ingredients of productivity.	325	3	5	4.4748	.89111
17.	Viable and performing organization must invest heavily on employee's development and modern technology	325	2	5	3.4021	1.05344
18.	Employee development enhances employee's knowledge, skill and ability which lead to performance.	325	3	5	3.5522	1.06611
19.	Employee development programmes makes positive contributions to	325	2	5	3.7671	.97332

	organizational performance					
20.	Knowledgeable and trained workers provide the demands of technology.	325	3	5	4.2564	.82453

Table 5: Descriptive Statistics for Employee development  
 Source: Researcher’s field survey result, 2015

Responses from the table 5. above show the descriptive statistics on Employee development. The respondents supported all the propositions raised on this variable. On 5-point scale, the mean score for the entire construct ranges from 3.4021 to 4.4748. This shows a positive response from respondents on the item being investigated.

4.1.5. Corporate Performance

S/N	Investigative Items	N	Minimum	Maximum	Mean	Std Deviation
21.	Process innovation enhances productivity and performance.	325	2	5	4.4037	.76563
22.	Product innovation leads to low operating cost and better performance.	325	2	5	4.4789	.72344
23.	Knowledgeable and trained workers attract high productivity and better performance.	325	2	5	3.3814	1.12231
24.	Appropriate structure enhances organizational performance	325	2	5	3.3914	1.09234
25.	Appropriate structure increases productivity and efficiency.	325	3	5	4.0717	.976211

Table 6: Descriptive Statistics for Performance  
 Source: Researcher’s field survey result, 2015

Responses from the table 6. above show the descriptive statistics on performance. The respondents supported all the propositions raised on this variable. On 5-point scale, the mean score for the entire construct ranges from 3.3814 to 4.4789. This shows a positive response from respondents on the item being investigated.

4.2. Comparing the Mean Responses and Correlation of Dependent and Independent Variables

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Firms performance & Process innovation	5	.705	.041
Pair 2	Firms performance & product innovation	5	.531	.074
Pair 3	Firms performance & Organizational structuring	5	.649	.059
Pair 4	Firms performance and Employee training	5	.601	.061

Table 7: Paired Sample Correlation  
 Source: Researcher’s field survey result, 2015

4.2.1. The mean responses for the process innovation and firm’s performance are shown below

Process Innovation	Firm’s Performance
3.5611	4.4037
4.4823	4.4789
3.7686	3.3814
3.4322	3.3914
4.4721	4.0717

Table 8: Paired mean responses of process innovation and firm’s performance  
 Source: Researcher’s field survey results, 2015

The mean responses for both variables are above 3.5 as shown in table 8. which confirm no difference between both means while the correlation is 0.705. This shows that a significant positive correlation at 70.5% existed.

4.2.2. The mean responses for the product innovation and firm’s performance

Product development	Firm’s Performance
3.5611	4.4037
4.4823	4.4789
3.7686	3.3814
3.4322	3.3914
4.4721	4.0717

Table 9: Paired mean responses of process innovation and firm’s performance  
Source: Researcher’s field survey results, 2015

The mean responses for both variables are above 3.3 which confirm no difference between both means while the correlation is 0.531. This shows that a significant positive correlation existed at 53.1%.

4.2.3. The mean responses for the organizational structuring and firm’s performance

Organizational Structuring	Firm’s Performance
4.3705	4.4037
3.4315	4.4789
4.3767	3.3814
3.7645	3.3914
3.4545	4.0717

Table 10: Paired mean responses of process innovation and firm’s performance  
Source: Researcher’s field survey results, 2015

The mean responses for both variables are above 3.5 which confirm no difference between both means while the correlation is 0.649. This shows that a significant positive correlation existed at 64.9%.

4.2.4. The mean responses for the process innovation and firm’s performance

Employee Innovation	Firm’s Performance
4.4748	4.4037
3.4021	4.4789
3.5522	3.3814
3.7671	3.3914
4.2564	4.0717

Table 11: Paired mean responses of process innovation and firm’s performance  
Source: Researcher’s field survey results, 2015

The mean responses for both variables are above 3.3 which confirm no difference between both means while the correlation is 0.601. This shows that a significant positive correlation at 60.1%.

4.3. T-Test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Firms performance	3.9454	5	.309925	.098007
	Process innovation	4.0488	5	.346356	.109527
Pair 2	Firms performance	3.9454	5	.309925	.098007
	Product innovation	3.9433	5	.489787	.154884
Pair 3	Firms performance	3.9454	5	.309925	.098007
	Organizational structuring	3.8795	5	.324844	.102725 1
Pair 4	Firms performance	3.9454	5	.309925	.098007
	Employee development	3.8905	5	.328712	.103948

Table 12: Paired Samples Statistics

		N	Correlation	Sig.
Pair 1	Firms performance & Process innovation	5	.705	.041
Pair 2	Firms performance & product innovation	5	.531	.074
Pair 3	Firms performance & Organizational structuring	5	.649	.059
Pair 4	Firms performance and Employee training	5	.601	.061

Table 13: Paired Samples Correlations

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Firms performance – Process innovation	.47653	.46976	.14561	.05523	.61322	4.179	4	.005
Pair 2	Firms performance – Product innovation	.36956	.38723	.13351	.04432	.65744	2.355	4	.037
Pair 3	Firms performance – Organizational structuring	.37421	.38976	.13562	.05523	.67983	2.6783	4	.029
Pair 4	Firms performance – Employee development	.56654	.43267	.15999	.18795	.89765	3.5232	4	.007

Table 14: Paired Samples Test

#### 4.4. Test of Hypothesis

##### 4.4.1. Hypothesis 1

- $H_{01}$ : Process innovation does not have significant effect on the performance of manufacturing firms in Nigeria.
- $H_{a1}$ : Process innovation does not have significant effect on the performance of manufacturing firms in Nigeria.
- Decision rule: We reject the null hypothesis if t-calculate is greater than t-tabulated OR if p-value is less than 0.05., otherwise we accept.
- Conclusion: Since  $t_{cal}$  of 4.179 is greater than  $t_{tab}$  2.132, and the p-value of 0.005 is less than 0.05 we reject the null hypothesis. We hereby agree that Process innovation has significant effect on the performance of manufacturing firms in Nigeria.

##### 4.4.2. Hypothesis 2

- $H_{02}$ : Product innovation does not have significant effect on the performance of manufacturing firms in Nigeria.
- $H_{a2}$ : Product innovation does not have significant effect on the performance of manufacturing firms in Nigeria.
- Decision rule: We reject the null hypothesis if t-calculate is greater than t-tabulated OR if p-value is less than 0.05., otherwise we accept.
- Conclusion: Since  $t_{cal}$  of 2.355 is greater than  $t_{tab}$  2.132, and the p-value of 0.037 is less than 0.05 we reject the null hypothesis. We hereby agree that Product innovation has significant effect on the performance of brewing firms in Nigeria.

##### 4.4.3. Hypothesis 3

- $H_{03}$ : Organizational structure does not have significant effect on the performance of manufacturing firms in Nigeria.
- $H_{a3}$ : Organizational structure does not have significant effect on the performance of manufacturing firms in Nigeria
- Decision rule: We reject the null hypothesis if t-calculate is greater than t-tabulated OR if p-value is less than 0.05., otherwise we accept.

- Conclusion: Since  $t_{cal}$  of 2.6783 is greater than  $t_{tab}$  2.132, and the p-value of 0.029 is less than 0.05 we reject the null hypothesis. We hereby agree that organizational has significant effect on the performance of brewing firms in Nigeria.
- Decision rule: We reject the null hypothesis if t-calculate is greater than t-tabulated OR if p-value is less than 0.05., otherwise we accept.
- Conclusion: Since  $t_{cal}$  of 1.858 is greater than  $t_{tab}$  1.833, and the p-value of 0.048 is less than 0.05 we reject the null hypothesis. We hereby agree that Leadership stability has significant effect on the performance of brewing firms in Nigeria.

#### 4.4.4. Hypothesis 4

- $H_{04}$ : Employee development does not have significant effect on performance of manufacturing firms in Nigeria.
- $H_{a4}$ : Employee development does not have significant effect on performance of manufacturing firms in Nigeria.
- Decision rule: We reject the null hypothesis if t-calculate is greater than t-tabulated OR if p-value is less than 0.05., otherwise we accept.
- Conclusion: Since  $t_{cal}$  of 3.5232 is greater than  $t_{tab}$  2.132, and the p-value of 0.007 is less than 0.05 we reject the null hypothesis. We hereby agree that Employee development has significant effect on the performance of manufacturing firms in Nigeria.

### 5. Discussion of Findings

The question for objective 1 was designed to determine whether Process innovation has significant effect on firm's performance using research question 1 and 5. The questionnaire items were validated with Rotated component matrix which retained all the items in the questionnaire since each value is greater than 0.35 in each row while the reliability was confirmed with Cronbach's Alpha. The items are reliable since their cronbach's alpha is above 0.5. With descriptive statistics, the mean responses for both variables from research questions 1 and 5 were above 3.0 at 5 point Likert scale which confirm that respondents agreed to issues raised in the questionnaire. To test whether there is correlation between Process innovation and firm's performance, Table 4.3 confirmed a correlation value of 0.705. This show that firm's performance and Process innovation is positively related. To test the hypothesis, a t- test was conducted at 5% level of significance. The result from t-test attests that tcal of 4.179 is greater than  $t_{tab}$  2.132, and the p-value of 0.005 is less than 0.05 and the null hypothesis was rejected. We hereby agree that Process innovation has significant positive effect on firm's performance. This result is line with the result of research by Ettlie & Reza (1992) that maintains that the process innovation, especially in the manufacturing organizations, can have significant impact on the efficiency and productivity of the organizations.

The question for objective 2 was designed to determine whether Product innovation has significant effect on firm's performance using research question 2 and 5. The questionnaire items were validated with Rotated component matrix which retained the entire questionnaire since each value is greater than 0.35 in each row while the reliability was confirmed with Cronbach's Alpha. The items are reliable since their cronbach's alpha is above 0.5. With descriptive statistics, the mean responses for both variables from research questions 2 and 5 were above 3.0 in five point Likert scales which confirm positive. To test whether there is correlation between respond to Product innovation and firm's performance, Table 4.3. confirmed a correlation value of 0.531. This shows that firm's performance and respond to product innovation are positively related. To test the hypothesis, a t- test was conducted at 5% level of significance. The result from t-test attests that tcal of 2.355 is greater than  $t_{tab}$  2.132, and the p-value of 0.037 is less than 0.05 and the null hypothesis was rejected. We hereby agree that respond to product innovation has significant positive effect on firm's performance. This result is in line with the result of study by Olson et al (1995) which concludes that Product innovation is related to functional performance

The question for objective 3 was designed to ascertain whether organizational structure has significant effect on firm's performance using research question 3 and 5. The questionnaire items were validated with Rotated component matrix which retained the entire questionnaire since each value is greater than 0.35 in each row while the reliability was confirmed with Cronbach's Alpha. The items are reliable since their cronbach's alpha is above 0.5. With descriptive statistics, the mean responses for both variables from research questions 3 and 5 were above 3.0 in 5 Likert points which confirm positive. To test whether there is correlation between organizational structures and firm's performance, Table 4.3. confirmed a correlation value of 0.649. This shows that firm's performance and organizational structure are positively related. To test the hypothesis, a t- test was conducted at 5% level of significance. The result from t-test attests that  $t_{cal}$  of 2.6783 is greater than  $t_{tab}$  of 2.132, and the p-value of 0.029 is less than 0.05 and the null hypothesis was therefore rejected. We hereby agree that organizational structure has significant positive effect on firm's performance. This result is in agreement with the result of research by Weir (1995) who concludes that firms that adopted appropriate structure yield higher profits than those that do not

The question for objective 4 was designed to ascertain whether Employee development has significant effect on firm's performance using research question 4 and 5. The questionnaire items were validated with Rotated component matrix which retained the entire questionnaire since each value is greater than 0.35 in each row while the reliability was confirmed with Cronbach's Alpha. The items are reliable since their cronbach's alpha is 0.5. With descriptive statistics, the mean responses for both variables from research questions 4 and 5 were above 3.5 in 5 Likert points which confirm positive. To test whether there is correlation between Employee development and firm's performance, Table 4.3. Confirmed a correlation value of 0.601. These shows that firm's performance and Employee development are positively related.

To test the hypothesis, a t- test was conducted at 5% level of significance. The result from t-test attests that  $t_{cal}$  of 3.523 is greater than  $t_{tab}$  of 2.132, and the p-value of 0.007 is less than 0.05 and the null hypothesis was therefore rejected. We hereby agree that accept that Employee development has significant effect on firm's performance.

### 5.1. Conclusion

Even though most firms in the manufacturing sector is not performing well, the result from selected few performing manufacturing firms used in this study attest to the fact that technological innovation is a major critical success factor behind their success. Evidence from data collected and analyzed, hypotheses tested, findings and discussion leads us to conclude that technological innovation and its supporting factors has significant positive effect on the performance of manufacturing firms in Nigeria

### 5.2. Recommendations

In the light of above findings, some pertinent recommendations can be made. These recommendations are geared towards assurance of organizational performance, survival and growth through technological innovation. This study recommends the following:

1. That Nigeria manufacturing firms should give more serious attention to technological innovation.
2. Organizations especially manufacturing firms should endeavor to lay more emphasis on employee development as it is an indispensable factor that facilitates technological innovation.
3. That Organizations should endeavor to adopt appropriate structure because appropriate structure provides a solid foundation for company's Operation and technology.

### 6. References

1. Adam, M.C., Farber, A. & Khallil, T. (2000), Financing technological innovation: Management of Technology II, USA: Institute of Industrial Engineers.
2. Ayres, R.U. (2008), Technology: The Wealth of Nations, Technological Forecasting and Social Change, Vol. 33 No.2, pp. 189-201.
3. Barnett, M.L. & Salomon, R.M. (2006), Beyond Dichotomy: The Curvilinear Relationship between Social Responsibility and Financial Performance", Strategic Management Journal, Vol.27 pp. 1101-56.
4. Central Bank of Nigeria (2004), Statistical Bulletin, Vol.15.
5. Cohen & Cyert, (1972) in Ukaje & Akanwa (2000), Corporate Planning and Policy, Owerri: Avan Publications.
6. Dauda, D. Y. & Akingbade, W. A. (2011). Technological change and employee performance in selected manufacturing industry in Lagos state of Nigeria. Australian Journal of Business and Management Research, 12(3), pp115-127.
7. Eeckelaert, L., Dhondt, S., Oeij, P., Pot, F., Nicolescu, G.I., Webster, J. & Elsler, D. (2012). Review of workplace innovation and its relation with occupational safety and health. Bilbao: European Agency for Safety and Health at Work.
8. Eheduru, T.O. (1999), Business Policy "An Introductory Analysis", Enugu: New Generation Ventures
9. Elnaga, D. & Imran, A. (2013). The Effect of Training on Employee Performance. European Journal of Business and Management, 1-11.
10. EU DG Enterprise and Industry (2012). Short meeting report Supporting social innovation in the workplace.[http://ec.europa.eu/enterprise/policies/innovation/policy/social-innovation/index\\_en.htm](http://ec.europa.eu/enterprise/policies/innovation/policy/social-innovation/index_en.htm)
11. Gerstenfield, A. & Wortzel, L. (2007), Strategies for Innovation in Developing Countries", Sloan Management Review, Fall, pp. 57-68
12. Glueck, W. F. & Jauch, L.R. (1984), Business Policy and Strategic Management, Singapore: McGraw-Hill International Book Company.
13. Griffin, W.G. (1996), Management, 5<sup>th</sup> edn., Boston: Houghton Mifflin company.
14. Hage, J.T. (1999). Organizational innovation and organizational change. Annual Review of Sociology, 25, 597-622.
15. Huselid, M. (1995). The impact of human resource management practices on turnover, productivity and corporate financial performance, Academy of Management Journal, vol. 38, pp. 635–670.
16. Hill, C.T. & Utterback, J.M. (2009), Technological Innovation for a Dynamic Economy", Pergamon Press, London.
17. Huselid, M. (1995). The impact of human resource management practices on turnover, productivity and corporate financial performance, Academy of Management Journal, vol. 38, pp. 635–670.
18. Ittner, C. & Larcker, D. (1998), Are Nonfinancial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction", Journal of Accounting Research, Vol. 36 No. 3, pp. 1-36.
19. Imaga, E. M. (2003), Theory and Practice of Production and Operations Management, Enugu: Rhyce Kerex Publishers.
20. Imran, M., Nadeen. M. & Shafique, H. (2014), Impact of Technological Advancement on Employee Performance in Banking Sector, International Journal of Human Resources Studies, Vol.4(1), pp.57-70.
21. Ittner, C. & Larcker, D. (1998), Are Nonfinancial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction", Journal of Accounting Research, Vol. 36 No. 3, pp. 1-36.
22. Kale, J. (2013), Breaking down Nigeria Resbase, assessed on Jan 5<sup>th</sup> from <http://businessdayonline.com/2014/04/breaking-down-nigeria-rebased-510-billion-gdp/#.VLiXGHaBDIU>
23. Kamzi, A. (2003), Business Policy and strategic Management, New Delhi: Tata McGraw-Hill publishing Company Limited.

24. Lam, A. (2004), Organizational innovation. In J. Fagerberg, D.C. Mowery & R.R. Nelson (eds.), *The Oxford handbook of innovation* (pp. 115-147). Oxford: Oxford University Press.
25. Lall, S. (1980), Developing Countries as Exporters of Industrial Technology", *Research Policy*, Vol. 9 pp. 24-52.
26. Lang, P. (2009), *Employee Development and Technological Innovation*, Germany: Internationaler Venley Der Wissenschaften.
27. Lawless, M.W. and Anderson, P.C. (1996), "Generational technological change: effects of innovation and local rivalry on performance", *Academy of Management Journal*, Vol. 39, pp. 1185-217.
28. Li, Y. and Deng, S.L. (1999), "A methodology for competitive advantage analysis and strategy formulation: an example in a transitional economy", *European Journal of Operational Research*, Vol. 118, pp. 259-70.
29. Manufacturers Association of Nigeria (2004), *Annual Report and Accounts*
30. Nnabuike, Ezimma. (2009), *Organizational Behaviour and Management Theory*, Nimo: Rex Charles & Patrick Limited.
31. Mumford, M.D. (2000), "Managing creative people: strategies and tactics for innovation", *Human Resource Management Review*, Vol. 10 No. 3, pp. 313-51.
32. OECD (2005). *Oslo Manual: Proposed Guidelines for Collecting and Interpreting Technological Innovation Data*. Paris
33. Oeij, P.R.A., Vroome, E.M.M. de, Kraan, K., Bossche, S. van den & Goudswaard, A. (2011a). *Werkgevers Enquête Arbeid 2010. Methodologie en beschrijvende resultaten*. Hoofddorp: TNO. [Netherlands Employers Work Survey 2010: Methodology and descriptive results. Hoofddorp: TNO.
34. Oeij, P.R.A., Dhondt, S. & Korver, T. (2011b). Social innovation, workplace innovation and social quality. *International Journal of Social Quality*, 1 (2), 39-49.
35. Olson, E. M., Walker Jr, O. C., & Ruekert, R. W. (1995). Organizing for effective new product development: The moderating role of product innovativeness. *The Journal of Marketing*, 59(1), 48-62
36. Onodugo, V. (2000), *Management Fundamentals and Practices*, Enugu: El Demark Ltd.
37. Onwuchekwa, C. I. (1993), *Management Theory and Organizational Analysis*, Awka: Goshen Prints and Publishing Company.
38. Polder, M., Leeuwen, G.V., Mohnen, P., & Raymond, W. (2010). Product, process and organizational innovation: drivers, complementarity and productivity effects: UNUMERIT, Maastricht Economic and Social Research and Training Centre on Innovation and Technology.
39. Polder, M., Van Leeuwen, G., Mohnen, P. & Raymond, W. (2010). Product, process and organizational innovation: drivers, complementarity and productivity effects. UNI-MERIT Working Paper Series, 2010-035. Maastricht: United Nations University and MERIT.
40. Pot, F.D. (2011). Workplace innovation for better jobs and performance. *International Journal of Productivity and Performance Management*, 60 (4), 404-415.
41. Pot, F., Dhondt, S., De Korte, E., Oeij, P. & Vaas, F. (2012). Workplace innovation in the Netherlands. In: I. Houtman (ed.), *Work Life in the Netherlands* (pp. 173-190). Hoofddorp: TNO Innovation for Life.
42. Pot, F., Dhondt, S. & Oeij, P. (forthcoming 2012). Social innovation of work and employment. In: H-W. Franz, J. Hochgerner & J. Howaldt (Eds.), *Challenge Social Innovation. Potential for business, social entrepreneurship, welfare and civil society*. Berlin: Springer Verlag.
43. Porter, M.E. (1983), "The technological dimension of Competitive Strategy", *Research on Technological Innovation, Management and Policy* 1, 1-33.
44. Prasad, P. (2005), *Crafting Qualitative Research: Working in the Post Positivist Traditions*, New York: M.E. Sharpe.
45. Roberts, P. W., & Amit, R. (2003). The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organization*
46. Rogers, E.M. (1962), *Diffusion of Innovation*, Glencoe: Free Press
47. Robinson, W. T. (1990). Product innovation and start-up business market share performance. *Management Science*, 36(10), 1279-1289.
48. Salkind, N.J. (2000), *Statistics for People who think they hate Statistics*, United Kingdom: Better World Books Ltd.
49. Sousa, R., Voss, C. (2002), Quality management revisited: are flective review and agenda for future research", *Journal of Operations Management*, Vol. 20, No. 1, pp. 91-109.
50. Tanja A., Borcka, B. & Vlado, D. (2012), The impact of Technology-enhanced Organizational Learning on Business Performance – An Empirical Study, *Journal of East European Management Studies*, vol.17, issue 3, pp.369-383.
51. Tefler, J.A. (2002), *Innovation*", in Biemans, W.G. (Eds), *Managing Innovation within Networks*, Routledge.
52. Utterback, J.M. (1994), *Mastering the Dynamics of Innovation*, Harvard Business School Press, Boston, MA.