

## Raising Quality and Eliminating Waste In The Developing Of Innovative New Process: A Better Capital Model

Marire Mary Ijeoma Ph.D.

Department of Business Administration,  
Enugu State University of Sciences and Technology, Enugu  
Corresponding Author: Marire Mary Ijeoma Ph.D.

---

**Abstract:** This seminar paper examined raising quality and eliminating waste in the developing of innovative new process: A better capital model, the researcher examined the effect of increase in quality on the growth of a new innovative process in an organization. And also the effect of waste elimination on the innovative growth of Nigerian organizations. The population consists of 120 staff of Aqua Rapha Investment Nigeria Limited. The study used the survey approach. The primary sources used were the administration of questionnaire to staff and distributors. The sample size of 100 was determined using Wimmer and Dominick sample size calculator. 100 copies of the questionnaire were returned and accurately filled. The validity of the instrument was tested using content analysis and the result was good. The reliability was tested using the Pearson correlation coefficient ( $r$ ). It gave a reliability co-efficient of 0.86 which was also good. The hypotheses were analyzed using  $f$ -statistics (ANOVA) tool. The findings of the study shows that increase in quality has significant effect on the growth of a new innovative process in an organization. The study equally indicates that waste elimination does not have significant effect on the innovative growth of Nigerian organizations. Based on the study researcher recommends that, it is necessary for companies in the manufacturing industry to intensify their innovation activities so as to create a competitive environment which will further improve their turnover and profitability. The firms are encouraged to spend more on research that relates to the improvement of their products, production process, marketing activities as well as employing high quality members of staff to enhance their productivity.

**Keywords:** Quality, Waste, Development and Innovation

---

Date of Submission: 20-08-2018

Date of acceptance: 06-09-2018

---

### I. Introduction

#### 1.1 Background of the Study

The environment has become part of the technical-economic, strategic, and managerial decision-making of companies only in recent decades. In the past, issues related to the choice of resources and energy, reduction of waste, and emissions into the environment were usually introduced by sector, following regulatory actions laid down by various national and international public bodies. The current perspective, instead, considers the reduction of the environmental impacts of production activities a positive factor, transforming it from an "obligation" (and an additional cost) into a market opportunity and a source of internal efficiency. New production strategies must be, therefore, conceived to combine efficiency and eco-efficiency, that is, "create more value with less impact". Promoting eco-efficiency improves eco-compatibility and competitiveness of the production system, enabling the achievement of apparently incompatible objectives, such as those of economic and productive excellence and environmental excellence (Youtie & Roper 2015).

The delay in achieving this goal is often attributed to market barriers, such as economies of scale related to the use of proven technologies and materials, and including cultural and economic factors, such as the difficulty of institutions in grasping the benefits and opportunities of developing sustainable production process. A positive contribution to the reduction of this gap can be given by the search for potential synergies between environmental disciplines and approaches and the management ones, starting from the common themes of investigation and the context of application: the manufacturing. In this regard, approaches that have great potential are those included, respectively, in the field of Industrial Ecology (IE) and those based on Lean Manufacturing (LM). IE has been recognized as a wide research field, focused on environmental improvements in production and consumption activities; conceived as the science of sustainability, IE uses an interdisciplinary approach to the design and operation of economic systems in an interdependent way with the natural system, in analogy with biological ecosystems. It involves products and processes design and technology, organization, and management solutions. In IE, issues, such as biodiversity, carrying capacity, life cycle, metabolism, are

analyzed to learn and try to implement "nature lessons" in economic systems (Abereijo, Adegbite, Ilori, Adeniyi&Aderemi, 2016).

Akinwale, Dada, Oluwadare, Jesuleye&Siyanbola (2012) are of the view that in these systems, each process is part of a large cycle involving various interdependent and interacting organisms; waste produced by an organism represents a resource for others and is, thus, cost-effective because it reduces waste to a minimum. The application of IE principles can support a sustainable industrial development or redevelopment; the efficient use and flows of materials and energy in products, processes, industrial sectors, and economies are investigated to highlight the potential role of industry in reducing environmental burdens.

Battisti&Stoneman (2017) opined that innovation in the manufacturing sector is crucial towards the realization of economic growth and development and it is driven by numerous factors which may be technological or non-technological. Innovation is of great importance in creating competitive advantage for a firm. Consequently, innovation processes vary in dimensions based on sector, field of knowledge, size of the firm, corporate strategy, prior experience, age, technological level, the objective of innovation and the market.

In recent times, innovation is seemingly not perceived only through the lens of new product development and process innovation or traditional R&D whereas non-technological activities also play a crucial role. In the view of Becheikh, Landry & Amara (2015) non- technological factors are necessary for achieving the most of firms' capacity for technological innovation. By and large, product and process innovations in manufacturing firms are reflected as technological, whereas organisational and marketing innovations are considered as non-technology- based.

Egbetokun, Siyanbola, Olamide, Adeniyi, &Irefin, (2018)affirmed that the practice and evolvement of innovation in manufacturing sector is subjected to interest in business and policy world. They are of the assumption that innovation leads to positive and evident business outcomes noticeably in higher margin returns. This sustains the competitive edge of the manufacturing small and medium enterprisesespecially in the developed economies with higher performance. Innovative manufacturing firms are liable to enjoy higher profitability levels, price premium and generate growth in turnovers with higher margins as a result of their new product development which may have explicit benefits over existing products in established markets.

Innovation enables sustainable growth and profitability through attentive control perspectives. Manufacturing SMEs are usually noted for introducing innovative new products which open up new market niches which serves as a backbone for their survival. In the present globalized economy, the manufacturing SMEs are threatened with stiff competition and growing demands for high quality products, services and market which is categorized by fast response time, reliable deliveries and new product functions. In such a dynamic and competitive environment, innovation is regarded as a key strategic factor for these manufacturing SMEs' competitiveness. According to the theoretical growth literature, the benefits derived by firms' innovation investments are proportional to the amount of resources spent, since firms' innovation is expected to reinforce growth (Frenz&Lambert2018).

## **1.2 Statement of Problem**

Companies in Nigerian perspective has no universal or nationally acceptable standard definition but could be defined based on the scale or size of business for specific needs. Manufacturing company's identification is a major problem in developing countries such as Nigeria because their businesses are difficult to count and they are also problematic to quantify independently as large number of them are in the formal sector. Hence, data on the number, size, geographical distribution and activities of enterprises and the SME sub-sectors are difficult to obtain. The activities of the manufacturing industry in Nigeria is being spearheaded by a body known as the Manufacturers Association of Nigeria (MAN) which was established in May 1971 as a limited liability company by guarantee. MAN is a national industrial association coordinating the activities of companies in private and public sectors in manufacturing, construction and service sectors of the national economy. MAN has then turned out to be a force to reckon with as the absolute umbrella under which activities of manufacturers are being coordinated in Nigeria.

The association through its representative memberships scattered across the six geo-political zones of Nigeria. It serves and acts as an avenue for government and others who seek a central point to air their views, ideas and reactions on matters pertaining to manufacturers for socio-economic gains. Through the establishment of the association, the private sector is now empowered to formulate and articulate policy recommendations that could strengthen the government efforts in policy formulation. Part of its objectives is to promote and protect manufacturers' mutual interest thereby creating a climate of opinion where manufacturers can operate efficiently and profitably. The manufacturing sector in Nigeria is a potential growth driver that must be harmonized so as to maximize its forward linkage with wholesale and retail trades from a domestic production perspective through accelerated value-added production thereby making manufacturing sector a major driver of growth and exports. Nigeria's Vision 20:2020 documents prepared by Marius-Dan Dalotain 2009 states that "an analysis of the

Nigerian manufacturing industry indicates that large firms are responsible for the bulk of non-oil, value added exports.

However, small and medium firms make up the bulk of the manufacturing and processing firms. Most of these firms are so small that they are unable to significantly participate in foreign markets. Increasing the volume of value-added exports can only be achieved by targeting investment in key sub-sectors and creating large firms focused solely on value- added exports. This will be achieved by creating an enabling environment so that small/medium firms can grow and prosper through increasing direct investment - both domestic and FDI - in the manufacturing industry.

### **1.3 Objectives of the Study**

This seminar paper titled "Raising quality and eliminating waste in the developing of innovative new process: A better capital model, is aimed at;

1. Examining the effect of increase in quality on the growth of a new innovative process in an organization.
2. Evaluating the effect of waste elimination on the innovative growth of Nigerian organizations.

### **1.4 Research Questions**

1. What are the effects of increase in quality on the growth of a new innovative process in an organization?
2. To what extent does waste elimination affect the innovative growth of Nigerian organizations?

### **1.5 Statement of Hypotheses**

1. Increase in quality does not have significant effect on the growth of a new innovative process in an organization.
2. Waste elimination does not have significant effect on the innovative growth of Nigerian organizations.

### **1.6 Significance of the Study**

This research work will be of immense help to the researchers as it will serve as a reference material for those who may wish to write on topics of this nature. It will also be of great importance to Nigerian manufacturing firms as it will enrich their knowledge on the benefits of quality product and waste reduction.

Finally, this study will be of great importance to the general public as it will help the policy makers to enact laws that will guide Raising of quality and elimination of waste in the developing of innovative new process.

## **II. Review of related Literature**

### **2.1. The Role of Quality**

A crucial role in manufacturing can be attributed to the variable *quality* (Q). The concept of Q has always been present in economic issues, since the beginning of trade; however, in the first post-world war period, the technological development and the renewed market expectations triggered the need to design methods and systems to set Q targets, as compliance with design specifications. In 1959, the U.S. Department of Defense issued the first regulation to solve Q problems in manufacturing, in particular in the nuclear and aerospace industries. The groundwork was then laid for a "quality system". In the United States, the development of Q concept led to the Total Quality System (TQS) view, based on the Total Quality Control developed by Feigenbaum, a "management methodology essential for the company and for customer satisfaction, an effective system to integrate the efforts of developing, maintaining, and improving the quality of the various organization groups so that marketing, engineering, production, and assistance are performed at the highest levels of economy, in line with customer satisfaction" (Keizer, Dijkstra,&Halman, 2012). Simultaneously, in Japan, a different approach was developed, known as Company Wide Quality Control (CWQC), inspired by the TQS, but based on a completely different concept. The CWQC is a real management strategy that aims to achieve maximum customer satisfaction through an involvement of all employees, from management to operational staff, towards excellence, to be pursued through a process of continuous improvement, so-called Kaizen (Luisa, Teresa, & Simone, 2012).

Recently, the concept of manufacturing has progressively assumed a wider perspective, which includes, not only technical issues, but also social and ethical aspects.

### **The Timeliness and the Relevance of Processes**

Abereijo, Adegbite, Ilori, Adeniyi&Aderemi, (2016) argued that at the end of the twentieth century, a referential variable in assessing business production performance is represented by *time* (T). In the 1980s, in fact, new management models that attempted to counter the growing complexity of context, by focusing on the processes and how to respond to the dynamics and variability of the markets were established. The objective of the joint improvement of performance, traditionally considered antithetical, oriented companies to the so-called Time-based competition, in which the benefits of reducing the overall time of the new products development

(*time-to-market*) and operational processes (*lead-time* of production, logistics, and administrative processes) are highlighted. The ability to develop and introduce new products faster than competitors, implies significant benefits in terms of profitability and market share, while reducing production and logistics cycles determines benefits in terms of improved joint performance, previously considered incompatible. Thus, key objectives do not affect obtaining the maximum efficiency and saturation of each single resource or activity, but, the overall performance of the production system (e.g., product quality, throughput time, flexibility of response).

### **Value in Production Dynamics**

The most popular formalization of the *value* analysis (V) in manufacturing, as a measure of the operating effectiveness of companies, has been provided by Akinwale, Dada, Oluwadare, Jesuleye, and Siyanbola (2012); he uses the value chain (VC) concept to quantify the contribution of each business activity for the production of the total value and the ability to transfer it to their customers. The ultimate goal is to maximize the margin, or added value, as the difference between the product/service (P/S) price and all costs generated by the various business activities, known as *value-adding activities*. Porter identifies the cost leadership and the differentiation as two strategic alternatives in achieving the so-called Competitive Advantage, in order to maximize internal efficiency, and, thus, reduce overall Cs, or try to raise the sales *price* (P) acting on customer expectations. Subsequently, the VC concept tends to take on a broader meaning, considering also the external relations and the connections/relationship along the supply chain.

The analysis of the links among the activities carried out by external stakeholders focuses the analysis on the entire "value system", made up of the value chains of competitors, suppliers, distribution channels, and final customers. The emphasis on connections allows overcoming of some limitations of the VC model. In fact, it has been observed that the economic actors are not related to each other according to the most simple, unidirectional, and sequential model described by the VC, but in far more complex modes (Battisti&Stoneman2017).

### **III. Value and Wastes: The "Lean Manufacturing"**

As illustrated so far, the relevance of the different variables to define the "rules of the game" in manufacturing is continuously changing. Technological, socio-political, and market pressures have revealed the most important pillars on which competitiveness is based, at different times and in different ways: reduce Cs, reduce T, and enhance Q to maximize V. The organization model that perhaps best embodies this *modus operandi*, was theorized in the early 1990s by Womack and Jones and is known as Lean Production (LP). The two researchers define it as a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. This is an approach that has incorporated the JIT and TQC principles, extending them to production processes, to logistics and finally to the supply chain system (Becheikh, Landry & Amara 2015).

### **Concept of Innovation**

The concept of technological and non-technological innovations emphasized that innovation consists of any of the following phenomenon: the introduction of new goods, the introduction of a new method of production, the opening of a new market, the conquest of a new source of supply of inputs or materials and the implementation of a new form organisation. He also affirmed that invention does not necessarily lead to innovation and that innovation has been recognized to play a central role in economic growth.

Egbetokun, Siyanbola, Olamide, Adeniyi, & Irefin, (2018) defined innovation as the adoption of a new idea, behaviour, process, product, device, system, policy, programme, device or services which are said to be new to the organisation or market. Innovation arises out of perceived and often clearly articulated market needs. More so, innovation is referred to as an effective way of improving firm's productivity due to the resource limitation issue facing a firm. This leads to focused R&D activities creating a host of products for the market. Innovation management literature stresses the significance of integrating product, process and organisational innovation for successful conveying of new ideas and new business opportunities into market success.

Frenz&Lambert (2018) believed essentially that innovation is a vital element for economic advancement of a country and attractiveness of an industry. Keizer, Dijkstra,&Halman, (2012) affirmed that innovation is one of the indispensable competitive weapons and mostly seen as a firm's core value capability. Based on empirical studies in Malaysia by Luisa, Teresa, & Simone, (2012), it was concluded that business innovation is crucial for a firm to exploit and enjoy new opportunities and to gain competitive advantage in the market. The crucial role that innovation plays is not only noticed in large firms but also in SMEs. In the views of Marius-Dan Dalota (2011), the empirical evidence in Portugal as regards the relationship between innovations and firm growth has concentrated on technological development. Even though the concept of innovation is mostly associated with the scientific and technological dimensions, there is a great consensus

that innovation cannot be classified only to the technological side. In view of this, innovation can be classified into technological and non-technological innovations.

### **Technological Innovation**

Technological innovation is typically seen as encompassing product and process innovations. Sawhney, Wolcott, & Arroniz, (2014) defined technological innovation as a new means of combining factors of production resulting from a change in inputs to produce outputs. Schumpeter regarded the process of technological innovation as sequential and central to an understanding of economic growth.

Youtie & Roper (2015) ascertained that technological innovation is a unified process which entails activities of technology, organisations, business and finance. It means that the entrepreneurs seize the market prospects for commercial benefits as the goal to create a stronger performance, more efficient and lower cost of production and operation system. From this process, new products and production method are introduced, new markets are exploited, new raw materials or semi-finished products are obtained and new business organisations are formed. Abereijo, Adegbite, Ilori, Adeniyi & Aderemi, (2016) examined the dynamic mechanism of technological innovation activities in China. The work argued that the main driving force of technological innovation of enterprises consists of six important factors. These factors include the benefit drive, the market or social demand pull, the driving force of enterprise employees, the corporate image and the driving force of technological development, market competition and the driving force of government. The first four are the internal forces which make enterprises accumulate technological capability, carry on technological innovation, and the rest are external which force enterprises to produce innovation behaviour.

Based on the relevance of technological innovation in Malaysia, Marius-Dan Dalota (2011) noted that technological innovation capability should be defined to be under the condition of certain scale, technology and economy. It is pertinent that entrepreneurs should make good use of available resources for technological innovation.

Considering the economic nature of a developing nation, technological innovation is a process by which firms understand and adopt the design and creation of goods and services irrespective of their newness to their competitors, their market or the world (Marius-Dan Dalota 2011). Technological innovation involves a sequence of activities such as application of new technology and methods; adopting new techniques in production and new management tactic or strategy; improving quality of production; developing new production; providing new service; exploring new market and realizing market value. It can be deduced that technological innovation of enterprises is the innovation in R&D, production, sale and management.

More so, Akinwale, Dada, Oluwadare, Jesuleye & Siyanbola (2012) opined that technological innovation encompasses a series of activities such as conceptualizing new ideas, designing products, prototyping, producing in volume, marketing, and commercializing among others. It is a process of knowledge creation, conversion, and application. The essence of technological innovation is the emergence of new techniques in production and its commercial application. It is only through continuous product innovation that SMEs can strengthen their competitive advantages and cope with market opposition. It was also affirmed that the promotion of sustainable development of SMEs through technological innovation can be revealed through the application of information technology as a driving mechanism to stimulate industrialisation.

Similarly, the use of automated means in all types of industries will transform technology level of traditional industries. This is with a view to enhance and lay a solid foundation for industrial competitiveness as well as restructuring the old industrial enterprises thereby improving organisational structure of small and medium enterprise, boost the vitality of traditional enterprises and promote enterprise collaboration. More so, through technological innovation and transformation, SMEs are opportune to transform and improve the techniques of their processing equipment, manage resources, assess environmental protection, stimulate clean production, accelerate research and development and new energy sources (Battisti & Stoneman 2017).

### **Classification of Technological Innovation**

Researchers in the past decades have paid much more attention to technological innovation with concise literatures illustrating various types of innovations based on the several surveys conducted. Becheikh, Landry & Amara (2015) and U.S Census Bureau in 2006, technological innovations are broadly classified into product and process.

#### **i. Product Innovation**

This refers to the implementation of product that is new or significantly upgraded for its intended usage that may include the integrated technical applications, components and materials or other characteristics therein. It integrates new knowledge or techniques, or a combination of both existing knowledge and techniques (Egbetokun, Siyanbola, Olamide, Adeniyi, & Irefin, (2018).

Product innovation necessitates the firm to be technologically inclined thereby enabling them to serve their customers well based on their capabilities. This will inspire the firm to engage in innovative activities by

boosting their internal competences so as to meet the market demands. Product innovation will arise only when a technically knowledgeable firm is able to recognize and respond to customer necessities by developing or improving products. Frenz&Lambert (2018) in their findings in the USA opined that markets and technology are core components that bring about development of a new product.

#### **Process Innovation**

This is the application of a new or significantly enhanced method of production or service delivery. It includes significant changes introduced in the process of production, skills involved, equipment or software that are engaged during the innovation phase. Usually, it is used to reduce unit costs of production or service delivery, to improve quality or deliver new or significantly improved products or services. They are essentially introduced into the firm's production or service operations that transform the way products are being manufactured Keizer, Dijkstra,&Halman, (2012).

Luisa, Teresa, & Simone, (2012) affirmed from their studies of process innovations of small firms in the USA that economic motivations, internal capabilities and technical competencies which a firm has gathered over time as well as their pool of expertise from learning or knowledge acquisition through outsourcing of new technological improvement were the major drivers that force these firms in embracing process innovation.

#### **Empirical Framework**

The relevance of innovation as noted by Marius-Dan Dalota (2011) is described as an avenue to a competitive advantage and superior profitability for a firm. Recent literature and studies on technological and non-technological dimensions of innovation Sawhney, Wolcott, &Arroniz, (2014) highlighted the complex nature of innovation processes where non-technological activities play a crucial role (Sawhney, Wolcott, &Arroniz,2014). There are rationale why innovations might have a positive association with firm's profitability and performance. Firms engaging in innovations can have higher profitability propensities as their new product development create new market superiority over existing products in established markets, thereby commanding a price premium leading to growth in sales performance and higher margins in terms of profitability.

Based on the studies carried out by Youtie& Roper (2015), in terms of firms' profitability and employment, firms with only technological innovations do not grow more rapidly than other firms. However, firm profitability and growth is positively associated with the combination of technological and non-technological innovations other than the use of technological innovation only. Egbetokun, Siyanbola, Olamide, Adeniyi, &Irefin, (2018) while studying the innovation strategies of German, UK, and Irish SMEs perceived that there is a strong linkage between innovation and turnover performance in these European countries. Abereijo, Adegbite, Ilori, Adeniyi&Aderemi, (2016) claimed that innovative intensity presents great opportunities for SMEs in terms of growth and expansion into new areas though they did not study the relationship between innovation and growth.

Akinwale, Dada, Oluwadare, Jesuleye&Siyanbola (2012) also analyzed the impacts of technological and non- technological innovations based on their determinants and effects using data of the German Innovation Survey (CIS 4) covering the years 2002-2004. Based on their comparison, they discovered that the share of firms introducing only technological innovations (13%) is lower than the share of firms introducing only non-technological innovations (24%) which indicates that the two innovations must be harnessed for a firm or an organisation to break-even and to enjoy competitive edge in the market. They also affirmed that technological and non-technological innovations are directly linked to each other both at the sector level and at the firm level. Their results showed that firms have an incentive to undertake non-technological innovation activities if they introduce technological innovations. This indicates that determinants of product and process innovations also affect the propensity to introduce non-technological innovations (Battisti&Stoneman, 2017). Technological and non-technological innovations must be inseparable if a firm must attain its full potentials.

According to Becheikh, Landry & Amara (2015) product innovation is proven to be an important source of competitive advantage to the firm and it increases firm product quality. Egbetokun, Siyanbola, Olamide, Adeniyi, &Irefin, (2018)studies proved that product innovation had positive and significant relationship with organisational performance and profit enhancement. More so, Egbetokun, Siyanbola, Olamide, Adeniyi, &Irefin, (2018) affirmed a positive impact of innovation on firms' performance and profitability from their study which sampled 744 Spanish-firms. They found that product innovation is strongly and positively related to firm performance.

Process innovation should also be stressed by a firm or an organisation as its primary distinctive competence for competitive advantage. Explicitly, process innovation is positively associated with firm growth. To support this argument,Youtie&Roper (2015) study on SMEs in Finland found that process and product innovations are positively related to firm performance i.e. the introduction of novel products will significantly improve firms' performance. Marius-Dan Dalota (2011) reconfirmed the positive and significant influence of process innovation on firm's performance and profitability. Luisa, Teresa, & Simone, (2012) testified from their

recent empirical findings in Malaysia that process and product innovations influenced firm performance significantly. It increases firm production efficiency.

Marketing innovation as a compliment to the technological innovation is a crucial concept for a firm to attain optimum performance in profit and growth. Keizer, Dijkstra,&Halman, (2012) noted that marketing innovation has a positive effect on sales growth and performance of a firm. If an organisational marketing prowess and potentials are efficiently and effectively harnessed with other forms of innovation, such an organisation is bound to be among the top in such industry. That is SMEs can achieve leadership positions by properly harnessing and applying aggressive innovation strategies in niche industries. Marketing innovation would also boost sales through the increasing demand for products, which in turn yields additional profit to innovative firms (Battisti&Stoneman (2017). In the same vein, Akinwale, Dada, Oluwadare, Jesuleye, and Siyanbola(2012) concluded with strong evidence through their study that market innovation positively influenced business performance and profitability. Additionally, Sawhney, Wolcott, &Arroniz, (2014) using an estimated model affirmed a highly significant relationship between a market-related innovative activity and firm performance.

Organisational innovation has also been confirmed by some studies to contribute to higher total productivity, thereby leading to higher profitability. Product innovation will only attain maximum benefit, if it is applied with the combination of organisational innovation, and such linkage will eventually give maximum results. Becheikh, Landry & Amara (2015) observed that organisational innovation has positive effect on firm's performance. It was also affirmed by Battisti&Stoneman (2017) that new resources and products have positive relationship on firm's financial performance and on overall performance of the firm as well. Organisational innovation significantly affects the performance of the firms, while non-technological innovation emphatically has multiple effects on firm's performance.

The Australian Bureau of Statistics surveys conducted in 1994 showed that non-technological innovation is significant in the manufacturing sector as the total non-technological innovations were observed to have occurred in 15 per cent of the firms compared to technological innovations which similarly occurred in 13 per cent of the firms.

However, Frenz&Lambert (2018) in 2012 investigated the effects of non- technological innovation on the performance of firms in the manufacturing and service sectors in Nigeria. The study revealed that non-technological innovation had a positive impact and improve profit margin of firms in the manufacturing sector, while the effect of non-technological innovation was also significant but with a negative signs for the service sector.

Furthermore, studies from Abereijo, Adegbite, Ilori, Adeniyi&Aderemi, (2016)analysed the impact of technological innovation and R&D on the firm's performance of the Nigerian service sector. The study revealed that technological innovation has positive impact and relationship on firms' performance. Similarly, another innovation studies opined that innovation activities in Nigerian firms are majorly focused on surmounting the severe economic environment where they exist, thereby reducing cost and improving profitability performance.

#### IV. Methodology

This study was to examine raising quality and eliminating waste in the developing of innovative new process: A better capital model. The population consists of 120 staff of Aqua Rapha Investment Nigeria Limited. The study used the survey approach. The primary sources used were the administration of questionnaire to staff and distributors. The sample size of 100 was determined using Wimmer and Dominick sample size calculator. 100 copies of the questionnaire were returned and accurately filled. The validity of the instrument was tested using content analysis and the result was good. The reliability was tested using the Pearson correlation coefficient (r). It gave a reliability co-efficient of 0.86 which was also good. The hypotheses were analyzed using f-statistics (ANOVA) tool.

#### V. Data presentation and Analysis

**Table 4.1** Response on the effect of increase in quality on the growth of a new innovative process in an organization.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	30	30.0	30.0
	Agree	40	40.0	70.0
	Neutral	7	7.0	77.0
	Disagree	6	6.0	83.0
	Strongly disagree	17	17.0	100.0
	Total	100	100.0	100.0

From table 4.1, 30 respondents representing 30.0 percent strongly agree **that** increase in quality has significant effect on the growth of a new innovative process in an organization. 40 respondents representing 40.0 percent agree, 7 respondents representing 7.0 percent were neutral, 6 respondents representing 6.0 percent disagree while 17 respondents representing 17.0 percent strongly disagree.

**Table 4.2** Response on the effect of waste elimination on the innovative growth of Nigerian organizations

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	35	35.0	35.0
	Agree	40	40.0	80.0
	Neutral	5	5.0	85.5
	Disagree	9	9.0	94.0
	Strongly disagree	11	11.0	100.0
	Total	100	100.0	100.0

From table 4.2, 35 respondents representing 35.0 percent strongly agree thatwaste elimination has significant effect on the innovative growth of Nigerian organizations. 40 respondents representing 40.0 percent agree, 5 respondents representing 5.0 percent were neutral, 9 respondents representing 9.0 percent disagree while 11 respondents representing 11.0 percent strongly disagree.

**Test of Hypotheses** Hypothesis One: Increase in quality does not have significant effect on the growth of a new innovative process in an organization.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.987 <sup>a</sup>	.973	.973	.11249

a. Predictors: (Constant), ICQ, GNN, INP.

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	138.038	5	27.608	2181.915	.000 <sup>b</sup>
	Residual	3.796	300	.013		
	Total	141.834	305			

a. Dependent Variable: GAO

b. Predictors: (Constant), ICQ, GNN, INP.

**Statistical criteria {first order test}**

**Coefficient of multiple determinants {r<sup>2</sup>}**

The R<sup>2</sup> {R-Squared} which measures the overall goodness of fit of the entire regression, shows the value as .973 and adjusted to .973. This means that R<sup>2</sup> accounts for 97.3 percent approximately 97 percent. This indicates that the independent variables accounts for about 97 percent of the variation in the dependent variable. Which shows goodness of fit? From the result, f-calculated {2181.915} is greater that the f-tabulated {2.7858}, that is, f-cal> f-tab. Hence, we reject the null hypothesis {H0} and accept Alternative hypothesis which means that the overall estimate has a good fit which also implies that our independent variables are simultaneously significant. We now conclude from the analysis that increase in quality has significant effect on the growth of a new innovative process in an organization.

Hypothesis Two: Waste elimination does not have significant effect on the innovative growth of Nigerian organizations

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.930 <sup>a</sup>	.864	.862	.19758

a. Predictors: (Constant), ICQ, GNN, INP.



ANOVA<sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	74.492	5	14.898	381.631	.000 <sup>b</sup>
	Residual	11.712	300	.039		
	Total	86.203	305			

a. Dependent Variable: WSTE

b. Predictors: (Constant), ICQ, GNN, INP.

### Coefficient of multiple determinants { $r^2$ }

The  $R^2$  {R-Squared} which measures the overall goodness of fit of the entire regression, shows the value as .864 and adjusted to .864. This means that  $R^2$  accounts for 86.4 percent approximately 86 percent. This indicates that the independent variables accounts for about 86 percent of the variation in the dependent variable. Which shows goodness of fit? From the result, f-calculated {381.631} is greater than the f-tabulated {2.7858}, that is,  $f_{cal} > f_{tab}$ . Hence, we reject the null hypothesis  $\{H_0\}$  and accept Alternative hypothesis which means that the overall estimate has a good fit which also implies that our independent variables are simultaneously significant. We now conclude from the analysis that waste elimination does not have significant effect on the innovative growth of Nigerian organizations.

## VI. Conclusion and Recommendations

According to the paper, it can be easily concluded that quality management is the most powerful vehicle for achieving competitive advantage and taking top positions in business matters. In a situation when high quality products and services are being offered by new, especially foreign competitors, when industrial and individual consumers increasingly demand quality, each firm has to carry out a revolution of quality advancement and provide quality definition in a manner perceived by the customers. The term revolution considers quality that besieges us while we sleep, eat and breath. It is considered important for a company that management is likewise besieged at every level with quality and persistence in its achievement.

The quality management is the means by which companies achieve their main and basic goal: consumer satisfaction. TQM achieves this with the help of people, teams that establish the following principles: appropriately authorized employees in the company, support of culture and internal awarding by means of

It becomes necessary for companies in the manufacturing industry to intensify their innovation activities so as to create a competitive environment which will further improve their turnover and profitability.

The firms are encouraged to spend more on research that relates to the improvement of their products, production process, marketing activities as well as employing high quality members of staff to enhance their productivity.

Any enterprise that refuses to engage in innovation activities will find it very difficult to compete with its rivals in the industry.

## References

- [1]. Abereijo, I. O., Adegbite, S. A., Ilori, M. O., Adeniyi, A. A., and Aderemi, H. A. (2016). "Technological innovation Sources and Institutional Supports for Manufacturing Small and Medium Enterprises in Nigeria". *Journal of Technology Management and Innovation*, 4(2), 82-89.
- [2]. Akinwale Y., Dada A., Oluwadare A., Jesuleye O., and Siyanbola W. (2012). "Understanding the Nexus of R&D, Innovation and Economic Growth in Nigeria". *International Business Research*, 5(11), 187-196.
- [3]. Battisti, G., and Stoneman, P. (2017). "How Innovative are UK Firms?" Evidence from the CIS4 on the Synergistic Effects of Innovations. Report for the Department of Trade and Industry.
- [4]. Becheikh, N., Landry R., and Amara N. (2015). "Lessons from Innovation Empirical Studies in the Manufacturing Sector. *Technovation*, 26(5/6), 644-664.
- [5]. Egbetokun, A. A., Siyanbola, W. O., Olamide, O. O., Adeniyi, A. A., and Irefin, I. A. (2018). "Innovation in Nigerian SMEs: Types and Impact". Paper presented in the IV Globelics Conference at Mexico City, September 22-24.
- [6]. Frenz M., and Lambert R. (2018). "Exploring non-technological and mixed modes of innovation across countries". Birkbeck, University of London and UK Department for Innovation, Universities and Skills. Retrieved March 2018 from: <http://jvi.wiwi.ac.at/index.php?action=filedownload&id=568>.
- [7]. Keizer, J. A., Dijkstra, L., and Halman, J. I. M. (2012). Explaining innovative efforts of SMEs. An exploratory survey among SMEs in the mechanical and electrical engineering sector in the Netherlands. *Technovation* 22(1), 1-13.
- [8]. Luisa C., Teresa, C., and Simone, G. (2012). Innovation and Internationalization of IT Companies-Comparative Case Studies in Brazil and Portugal. 7th European Conference on Innovation and Entrepreneurship (ECIE), 57-67.
- [9]. Marius-Dan Dalota (2011). "Small and Medium Enterprise's Growth and New Technologies Implementation". *Romanian Economic and Business Review*, 6(2), 7-18.
- [10]. Sawhney, M., Wolcott, R. C., and Arroniz, I. (2014). "The 12 Different Ways for Companies to Innovate". MIT Sloan.
- [11]. Youtie J., and Roper S. (2015). "Innovation and Profitability in Georgia Manufacturers". International Workshop on New Directions for Innovation Measurement and its Use for Strategy and Policy, Atlanta, Georgia, May 12-13.