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Technological Change and Performance of Plastic Manufacturing Firms in Enugu State Nigeria

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Abstract: *The seeming fear of the cost of procuring new technology and training employees on its usage which delayed adaptation of technology triggered this study to explore the type of relationship that exist between technological adaptation and customer retention of plastic manufacturing firms in Enugu State. The study was anchored on Michael Porter's Competitive Advantage Theory developed in (1980). Correlation Research Design was adopted for the study. Two plastic firms were selected and the population of the study was ninety-six (96). Pearson's Product Moment Correlation Co-efficient was used to analyze the data. It was deduced that technology adaptation has significant positive relationship with customer retention of the selected manufacturing firms in Enugu State.Therefore, the study recommended among other things, that firms should be ready to adapt and evolve to new technology in order to provide more effective and efficient output which will aid in retaining customers.*

1. INTRODUCTION

Goods and services manufactured in Nigeria and in the world at large have been tremendously influenced by the systematic application of technology (Dauda & Akingbade, 2011). Technological environment is highly dynamic as new technologies are invented; old ones become obsolete while the shift or changes can affect costs, quality of the product and performance of the organizations. Plastic manufacturing firms worldwide that are engaged in business activities are technologically dependent because they do not exist in a vacuum. For them to succeed and achieve the organizational objectives, they need to adopt strategies that would align them properly with the changes in the technology. Most plastic manufacturing firms have realized that their performance play a crucial role in determining its success (Zheng, Sharan &Wei, 2010; Ajila & Aawonusi, 2004).

The production of goods and services by various organizations are greatly affected by diverse types of technology which could be in form of machines, equipment, information and communication comprising of knowledge, tools, and method used for the production (Dauda, 2009). The state of technology determines the quality and quantity of goods and services produced likewise the performance of any firm or organization in terms of patronage and customer retention. Technology influences living conditions of the individuals and groups in organization. Technology has direct link to the relationship between the employer and the employee. Technology, labour and capital are interconnected. Some technology use a lot of labour and some use more of other equipment or capital. Investors and managers base their selection to their prices and prefer the one with lesser price to maximize profit. The choice and preference place on capital at the expense of labour may reduce labour co-operation, lower their morale, productivity, quality product output, create conflict that may reduce the profit of the firm in that customers may not be satisfied which will affect the way they view the products of the organization and may not engage in repeat patronage and also it will negatively affect the customer retention capability of the organization (Dauda & Akingbade, 2011). When technological change occurs, it can increase the productivity of the capital, labour and other factors of production. The bias of technological change determines which societal groups are the winners and which are the losers and thus their willingness to embrace technological change (Dorazelski & Jaumandreu, 2012).

Contemporarily, there is a plethora of technological changes or innovations ranging from input resources, such as information ideas,

raw materials, machines, and labour among others, to the consumption of finished goods and services. Technology deals on technological innovation, advancement in technology, nature of technological change and diversity of technology which affect business operation that are technologically inclined (Ogugua & Nze, 2011). So, for the manufacturing firms to succeed, they need to adapt to the changes in technology in order to be relevant in this constantly dynamic and technologically-oriented business environment (Dauda & Akingbade, 2011). Through adoption of newer, more advanced technologies and practices, firms can increase their production capabilities, improve their productivity, and expand their lines of goods and services and satisfy their customers more to make them return for purchase. Baldwin, John and Sabourin (2009) posit that advanced technology adoption is an innovation activity which affects firm performance. The plastics industry is a key enabler of innovation of many products and technologies in other sectors of the economy like healthcare, energy generation, aerospace, automotive, maritime, construction, electronics, packaging or textile. None of these sectors would innovate and grow as much as they do without plastic materials and solutions.

Innovation and growth in every country depend on manufacturing.It appears that the focused firms which are Toplog Enterprises Nigeria Limited and Acoben investment Nigeria Limited develop slowly in terms of technological advancement. This is probably because the cost of procuring this equipment appears monumental. The cost of maintaining the equipment and the cost of training the personnel that will operate the equipment tend to be huge. This is probably the main reason the studied firms lose their customers to rival organizations that have embraced the new technologies and are making maximum use of them to produce high quality products that enhance customer retention. This, therefore, is the background upon which this work is developed.

2. STATEMENT OF THE PROBLEM

Equipment and machines have become so complicated and truncated that they are comprised of myriads of technologies (Dauda & Akingbade, 2011). The level of change in technology may influence the plastic manufacturing firm's ability to produce quality goods and services to align with customer's changing tastes and preferences which influences their choice of purchase and which may also make the organizations of study not to be productive, profitable, create wealth and improve the performance through customer retention to improve the growth of the firms.

With the rising need for plastic manufacturing firms to keep up with the competitive pace in the manufacturing industry, the manufacturing firms; Toplog Enterprises Nigeria Limited and Acoben investment Nigeria Limited may have to adapt to the constant changes in technology within the industry. The cost of purchasing new equipment, training employees on the technological know-how of the equipment, recruiting skilled and knowledgeable employees to operate the equipment and the fear of incurring huge cost in the installation of the technologies are the reasons these firms seem not to be too keen on embracing new technologies and this development precipitated the deficient production performance of the organizations.

The inability of these firms to embark fully on embracing technological change might result in paucity of customer delight and retention capability. The observed negative attitude of these manufacturing firms towards the adaptation of technological change for their operation stimulated the researcher to embark on this study.

3. OBJECTIVES OF THE STUDY

The broad objective of the study is to ascertain the type of relationship that exists between technological change and performance of selected plastic manufacturing firms in Enugu State.

The specific objective of the study is to;

i. Determine the type of relationship that exists between Technological Adaptation and Customer Retention

of the selected plastic manufacturing firms in Enugu State.

4. RESEARCH QUESTIONS

i. What is the type of relationship that exists between Technological Adaptation and Customer Retention of the selected plastic manufacturing firms in Enugu State?

5. RESEARCH HYPOTHESES

H_A: There is no significant relationship between Technological Adaptation and Customer Retention of the selected plastic manufacturing firms in Enugu State.

6. SIGNIFICANCE OF THE STUDY

The research is relevant for any kind of organization or firm whether public or private. This is because the change in technology can affect the organization or firm either positively or negatively. It will also help them to adapt to new technology in order to carry out their activities and operations effectively and efficiently. Also, the research will be beneficial to organizations and firms that make use of technology especially the manufacturing firms that seek to remain relevant in the face of the changing technology and in the competitive business environment. Other researchers will benefit from it too, because, they will continue this line of research in other areas of technology.

7. SCOPE OF THE STUDY

The study was delimited to two plastic manufacturing firms in Enugu State. The firms are Toplog Enterprises Nigeria Limited and Acoben Investment Nigeria Limited.

8. REVIEW OF RELATED LITERATURE

8.1 Conceptual Review

8.1.1 Meaning of Technology

Technology is one of the pervasive factors in the environment. It is considered one of the world's fastest agents of change. It is the science which provides the knowledge, that is, it is the sum total of knowledge of ways of doing things. It includes inventions, techniques, and a store of organized knowledge about everything. Its main influence is on the ways of doing things, how we design, produce, distribute and sell goods as well as services (Koontz, Cyril & Heinz, 1980). It includes a new development in products, processes, and materials. The level of technology in a particular industry determines to a large extent what products and services will be produced, which equipment will be used, and how operations will be managed (Ile, 2010). Khalil (2000) sees technology to be the result of man's learned and acquired knowledge or his technical skills regarding how to do things well.

8.1.2 Technological Change (TC)

Technological change is a term that is used to describe the overall process of invention, innovation and diffusion of technology or processes. The term is synonymous with technological development, technological achievement, and technological progress. In essence, technological change is the invention of technologies (including processes) and their commercialization through research and development (producing emerging technologies), the continual improvement of technologies (in which they often become less expensive, and the diffusion of technologies throughout industry or society (which sometimes involves disruption and convergence) (www.wikipedia.com).

Underpinning the idea of technological change as a social process is general agreement on the importance of social context and communication. Technological change is seen as a social process involving producers and adopters and others (such as government) who are profoundly affected by cultural setting, political institutions and marketing strategies.In free market economies, the maximization of profits is a powerful driver of technological change. Generally, only those technologies are developed and reach the market that promise to maximize profits for the owners of incoming producing capital. Any technologies that fail to meet this criterion even though they may satisfy very important societal needs are not developed. Therefore, technological change is a social process strongly biased by the financial interests of capital (Huesemann & Huesemann, 2011).

The scope of technological change includes the following categories;

1. Increase ability to generate, store, transport, and distribute electricity.

2. Increased ability to design new materials and change the properties of others so that they better serve needs. For instance, plastics and drugs.
3. Mechanization or automation of physical processes.
4. Mechanization or automation of certain mental processes, e.g. computer which greatly expands our ability to store, manipulate, select and supply the data.
5. Extension of human ability to see things, the right vision instrument (Koontz et al, 1980).

According to Nathan Rosenberg (1976), technological change is a major ingredient of long-term economic growth, and it is characterized by a high degree of uncertainty. Understanding the nature of these uncertainties and the obstacles to surmounting them is not a trivial matter. Rather, it goes to the heart of how new technologies are devised, how rapidly they diffuse, the ultimate extent of that diffusion, and their eventual impact on economic performance and welfare. The uncertainty of technological change is one that society cannot hedge against and cannot diversify away (although, of course, individual firms engaged in R&D can). Technological change involves two levels of uncertainty. One is the firm's micro problem: Will a particular line of research pay off? That question can be decomposed into a whole host of sub questions that compound each other: Can this technical problem be solved at all? Can we solve it? Can we do so before anyone else does? Will it sell, and at what price? The other level is the economy's macro problem: What kind of technological regime will emerge as dominant? Will it be using digital or analog computers? This is the kind of uncertainty that historians have to deal with when they wish to explain why a society's production techniques developed in one direction but not another, but it is also hugely relevant for decision-makers at the micro level.

8.1.3 Performance

Performance is best defined as being a function of employees' workplace behaviours (Borman & Motowidlo, 1993). Jones and George (2009) define organizational performance as the measure of how the manager utilizes the resources of the organization as well as satisfy its stakeholders. It is the accomplishment of a given measured task against preset known standards of accuracy, completeness, cost, and speed. In a contract, performance is deemed to be the fulfilment of an obligation, in a manner that releases the performer from all liabilities under the contract.

Performance of industry comprises the actual outputs or result of an organization as measured against its intended output (goals and objectives). The performance also encompasses three specific outcomes: financial performance (profit, return on assets, productivity, and return on investment), product market performance (market share, sales) and shareholder return (total shareholder return, economic value added) (Richard, Devinney, Yip & Johnson, 2009)

8.1.4 Technological Adaptation

Adaptation means the process of changing something to suit a particular situation. It is the process or condition of being adapted; something produced by modification.T echnological adaptation can be defined as a process that begins with awareness of the technology and progresses through a series of steps that end in appropriate and effective usage. It is the key issue for the enterprises to be able to manage the technological changes. The adaptation in this case, means to be able to adapt new and emerging technologies into the manufacturing processes. This definition implies that the technology adaptation is affected with the capability of the enterprise performing technology forecasting as well as doing innovations. Technology adaptation includes tool effect, human effect and knowledge effect. When technological adaptation is completed, it will be implemented with technological forecasting and technological innovation phases to form the technological change management model (Ayhan, 2008).The essence of technological adaptation is to make an analysis of structure change in organization, in order to adjust to the impact brought about by technology. It is the application of technology in order to reduce vulnerability. Technological adaptation entails changing from the existing

technology so as to suit the situation or circumstances in the organization or firm. It is necessary for the plastic manufacturing firms to be ready at all times to accept any technology that will be of benefit to them in order to produce quality products that will suit the needs of the consumers/customers.

Technological Adaptation includes;

1. Awareness – potential users learn enough about technology and the benefit to decide whether they want to investigate further.
2. Assessment – potential users evaluate the usefulness and usability of the technology, and the ease or the difficulty of adopting.
3. Acceptance – potential users decide to acquire and use the technology, or decide not to adopt.
4. Learning – users develop the skills and knowledge required to use the technology effectively.
5. Usage – users demonstrate appropriate and effective use of the technology (www. bridges-to-technology.com).

8.1.5 Customer Retention

There was a time when consumers were familiar with the merchant's products, and storekeepers knew their consumers and their needs. However, 19th and 20th century technological developments provided buyers with greater market opportunities and merchants slowly began to lose their local monopoly on commerceand started losing customers (Nataraj, 2010). The personal merchant-consumer relationship gradually diminished when technology provided shoppers with other options. Therefore, organizations started thinking of how to retain the loyalty of customers. The goal of organizations is to improve service and regain lost market share. Customer retention now became a primary objective of organizations and started talking about customer retention management (CRM). Although most firms use CRM for new customer acquisition, many believe the real value of CRM is customer retention (Chan, 2005). This emphasis allows firms to learn meaningful information about the customer, learn how to satisfy them, and determine how and why customers interact with the company. CRM also builds technical and non-technical communication networks which strengthens the relationship between business and consumers (Tokman, Davis& Lemon, 2007).

Satisfaction, loyalty and commitment are three primary components of an effective CRM-retention program (Terblanche, 2006). Each customer's needs are different, and CRM would not be necessary if all customers were homogeneous. CRM identifies and helps retain valued customers, it helps increase the customer base and it utilizes pricing signals to encourage less profitable consumers to become loyal and more profitable and uses technological adaptation to offer sophisticated and good quality products to customers (Milakovich, 1995). Higher retention leads to lower customer defection and higher profits which will catapults the performance of the organization and helps it have a competitive edge over competitors (Sorce & Edwards, 2004). Lengthy customer relationships reduce acquisition and business activity costs. This can be significant when new customer acquisition costs are high (Yoda& Kumakura, 2007). Moreover, business relationships that foster customer tenure can improve the firm's efficiency as purchase volume increases and relationship cost decrease (Ang& Buttle, 2005).

9. THEORETICAL FRAMEWORK

This work is anchored on Competitive Advantage Theory by Micheal Porter in 1980. The term competitive advantage refers to the ability gained through attributes and resources to perform at a higher level than others in the same industry or market (Christensen and Fahey 1984, Kay 1994, Porter 1980 cited by Chacarbaghi & Lynch 1999). A firm is said to have a competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential player (Barney 1991 cited by Clulow, Val, Gerstman, Julie, Barry, & Carol 2003). Competitive advantage is seen as the strategic advantage one business entity has over its rival entities within its competitive industry. It is a business concept describing attributes that allow

an organization to outperform its competitors. Achieving competitive advantage strengthens and positions a business better within the business environment. Successfully implemented strategies will lift a firm to superior performance by facilitating the firm with competitive advantage to outperform current or potential players (Passemard & Calantone 2000). To gain competitive advantage, a business strategy of a firm manipulates the various resources over which it has direct control and these resources have the ability to generate competitive advantage (Reed & Fillippi 1990 cited by Rijamampianina 2003). The attributes that could provide competitive advantage for a firm may include access to natural resources, such as high grade ores or inexpensive power, highly skilled personnel, geographic location, high entry barriers. Competitive advantage makes sure customers remain loyal through offering superior products and services. Value proposition is important when understanding competitive advantage (Passemard & Calantone 2000).

This theory suits this work because employee skill sets, knowledge and competencies which could be attained and nurtured through proper employee's participation improves the dynamic capability of both the employees and the firms and it is a source of competitive advantage which is the fulcrum of competitive advantage theory.

9.3 Empirical Review

Motohashi (2012) determined the relationship between innovation and firms' survival, based on the linked dataset of the Census of Establishment and Enterprise and the Institute of Intellectual Property (IIP) Patent Database for Japanese firms. They constructed the indicators on the organization of innovative activities, such as external collaboration in inventions and the type of collaborative partners, and disentangle two competing factors, i.e., technological capability (positive influence on firms' survival) and commercial risk (negative influence on firms' survival). They found that the risk factor surpasses the capability factor, thus, the impact of patenting on survival has a negative correlation with firms' survival at the end.

Dauda and Akingbade (2011) carried out a study on technological change and employee performance in selected manufacturing industry in Lagos State of Nigeria. The study was guided with four objectives. The population of the study consists of 1256 employees from 30 manufacturing industry in Nigeria. Data was collected using questionnaire using a five point likert scale. The variables in the questionnaire were correlated. The data were analyzed using inferential statistical method of regression and ANOVA. The finding reveals that employee relations do not have significant relationship with technological change. The study recommends that employee relation should be considered in the management of techno logical change for profitability, competitiveness and survival of the Nigerian industry.

Omoju, Ikani, Ribaduand Chukwunonso (2011) ascertained the linkage between information and communication technology and firm performance of CHAMS Plc in Abuja. Data were gathered through questionnaires and interview. Nineteen respondents were used. Frequency and percentages were used to analyse the data. The findings showed that information and communication technologies alone cannot produce sustainable advantages, but that firms must organize and manage information and communication technologies in such a way as to leverage the complementary human and business resources. The results also suggest that adopting information technology has positive effects on innovative practices, which increases the competitive advantage of firms.

Baldwin et al. (2009) carried out a research on technological change in private and public sector. The study explored the difference in the use of methods of introduction of significantly improved technologies within the Canadian economy in both private and public sector. Data were collected from the 2006 Survey of Electronic Commerce. The study found out that 4 out of 5 public sector organizations introduced significantly improved technologies and less

than half of the private sector firms introduced significantly improved technologies. In other words, the percentage of public sector organizations introducing significantly improved technologies is twice that of the private sector firms.

Aubert, Eveand Muriel (2011) assessed the relationship between new technologies innovative workplace practices and the age structure of the workforce in a sample of French manufacturing firms. The data were sourced from COI (Changements Organizationnels et Informatisation) survey. It was carried out at the end of 1997 and covers 4,283 firmswith more than 20 employees in the manufacturing sector. The data were analyzed using correlation coefficient. The finding is that wage-bill share of old workers is lower in innovative firm and that the opposite holds for younger workers. It also shows that technology affects older workers through reduced hiring opportunities as compared to younger workers.

Adereti anad Oladejo (2010) examined impact of ICT on the performance of micro finance institutions in Ogun State Nigeria. The methodology used in this research work is a non-parametric statistics [Chi-square] it was employed in testing the hypothesis formulated equally regression analysis was also carried out to test whether there is any significant relationship between the levels of automation of micro banking services. The major objective was to capture the contributions of ICT on the development of Micro finance Banks in Nigeria. His findings revealed that the recent upsurge in effectiveness and efficiency in the micro banking sub sector in Nigeria is attributed to the high investment in information technology. Their study concluded that information technology is a very wide area in which new things are being discovered every day. Therefore micro finance banks in Nigeria should encourage their customers by providing regular information technology development.

Oluwatoni, Abahand and Achimugu(2011)conducted a research on the impact of information technology in Nigeria's Banking Industry. His specific objective was to ascertain how quality banking has been enhanced through the use of IT. The study further reveals that the deployment of IT facilities in the Nigerian Banking Industry has brought about fundamental changes in the content and quality of banking business in the country.

Miroslav, Ilaria and Elisa (2012) executed a study on technological change and organizational performance in Europe. The study examined the relationship between technological change and organizational performance. Data were drawn from the European Working Condition Survey. Simple correlation was used to analyse the data for the study. The study found out that there is a relationship between technological change and organizational performance. The study acknowledged that it is of importance of the employees to assimilate new technology.

Kajogbola (2004) investigated the factors responsible for the present level of adoption of these technologies in the organization in his work on the impact of information technology on the Nigerian economy in the manufacturing and service sectors. Both primary and secondary data were used for the study. The study found out that adoption of these technologies by different sectors of the economy have direct impact on the organization's efficiency and have led to more rapid acceleration of development. The study recommends that there should be flexibility both in the private and public sectors in order for the industries to adapt to changes in technology.

Akbar (2011) determines the effect of technological change on management accounting change in Iran manufacturing firms. The study used descriptive survey design. T test, Friedman test and Kruskal test were used for the hypothesis. Both the primary and secondary data were used for the study and the industries used were randomly selected. 150 questionnaires were given out while 112 were answered. The result was that technological change has effect on management accounting change. The study

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recommends that firms must replace traditional and individualized method of working in order to increase the quality and reduce the cost price.

2.4 Summary of Reviewed Literature

From the work reviewed, a number of studies have been done on technological change as it relates to firmsperformance both in Nigeria and in other countries, but, no study has been carried out on technological change and performance of plastic manufacturing firm in Enugu State. It is this gap that the study seeks to fill**.**

10. METHODOLOGY

10.1 Research Design

A correlation survey research design was used for this study since the research objective seeks to determine the type of relationship existing between the dependent and independent variables.

Table10. 1*: Sampling Frame*S/N PLASTIC FIRMS Locations Sen. zone

1	Nokos Plastic Nigeria	Ogui	Enugu North
2	DVC Plastic Company Ltd	Emene	Enugu North
3	Innoson Technical and Industries Compnay Ltd	Emene	Enugu North
4	Acoben Investment Nigeria	Ogui	Enugu North
5.	Ekido International Resources Ltd	Amuri	Enugu East
6.	Eagle Heights Plastic Industries Ltd	Oji River	Enugu South
7.	Eastern Plastic Ltd	Emene	Enugu North
8.	Sylva Construction Company Ltd	Umuokoloagu	Enugu North
9.	P.N Ibeanu & Company Nigeria Ltd	Railway line	Enugu North
10.	Osi Agency	Zik Avenue	Enugu North
11.	Nnwanne Amaka	Onuasata	Enugu North
12.	KC Winners Nigeria	Umunevo	Enugu South
13.	TS Shelters & Homes	Emene	Enugu North
14.	God First Store	Tranks Elulu	Enugu North
15.	Toplog Enterprises	Uwani	EnuguSouth

Source: Field Work, 2016.

Table 1 above presents the names and locations of all the plastic manufacturing firms in Enugu State. The researcher used simple random selection to pick two of the firms. The firms are Acoben Investments Nigeria and Toplog Enterprises.

10 .1Population of the Study

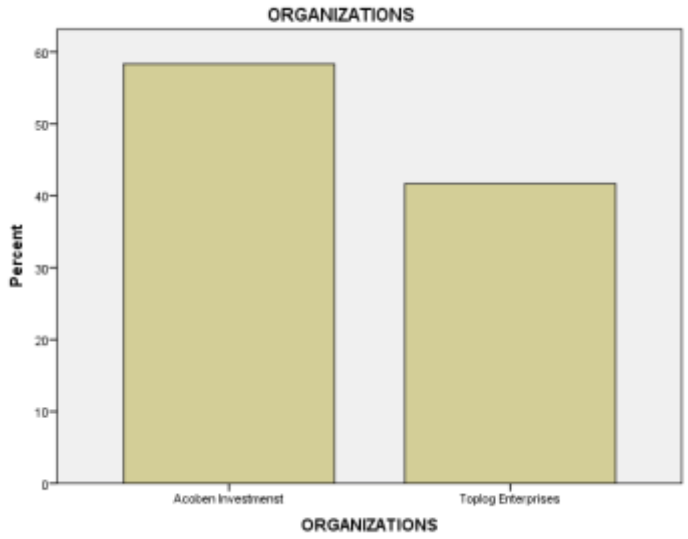
Table10. 2: *Population of the firms*

S/N	ORGANIZATION	POPULATION
1.	Acoben Investment Nigeria	56
2.	Toplog Enterprises	40
TOTAL		**96**

Source: Field Survey, 2016.

The table 2 above shows that the population of the organizations used for the study. Acoben and Toplog have 56 and 40 employees respectively.

Chart 1: ***Population Percentages***



The Bar chart above represents the population percentages of the focused firms. Acoben constitute 58 percentage while Toplog has 42 percentage of the population of the study.

10.3 Sample Size and Sampling Technique

Because the population of the study is small, complete enumeration was utilized; the entire population was studied.

Table 10.3: ***Distribution and Response Rate to the questionnaire***

S/N	Organization	Distributed	Returned	Percentage
1	Acoben Investment Nigeria	56	49	88%
2	Toplog Enterprises	40	36	90%
	Total	**96**	**85**	**89%**

Source: Field Survey, 2016.

Table 3 shows the total number of questionnaire distributed which was 96 copies and total number collected which was 85 representing 89%. The number of valid questionnaire was 82 which mean that 3 copies were voided for lacking the correct responses and wrongful

filling. Thus, 82 copies representing 85% of the population was used for the analysis.

10.4 Instrument of Data Collection

Primary source of data was utilized in collecting relevant data for the study. A questionnaire structured in a Likert Scale of 5 point was used.

10.5 Validity of Instrument

To ensure that the instrument for data collection was reliable, face and content validity was carried out. To achieve this, copies of the instrument were sent to research experts and validators whose corrections were affected before it was certified valid.

10.6 Reliability of the Instrument

The reliability was ascertained by sharing 19 copies of questionnaire representing 20% of the population of the study to employees of Eastern Plastic Limited. The coefficient obtained was .935 which is high enough to assert that the instrument was reliable.

Table 10.5: Reliability Table

Reliability Statistics			
Cronbach's Alpha	Part 1	Value	.859
		N of Items	5[a]
	Part 2	Value	.732
		N of Items	5[b]
	Total N of Items		10
Correlation Between Forms			.878
Spearman-Brown Coefficient	Equal Length		.935
	Unequal Length		.935
Guttman Split-Half Coefficient			.833

Source: SPSS Ver. 20, 2016 Field Survey

The formula used in calculating the Coefficient is given as:

$$r_{SB} = \frac{2r_{hh}}{1 + r_{hh}}$$

Where

r_{hh} = Pearson correlation of scores in the two half tests.

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Applying the formula, we would have:

$$r_{SB} = \frac{2 \times 0.878}{1 + 0.878}$$

$$r_{SB} = \frac{1.756}{1.878}$$

$$r_{SB} = 0.9350373$$

10.7 Method of Data Analysis

The data collected was analyzed using Pearson's Product Moment Correlation Coefficient. This is occasioned because of the fact that the objective of the study seeks to determine the type of relationship that exists between independent and the dependent variable.

11. DATA PRESENTATION AND ANALYSIS

11.1 Data Analysis

Keys used in the Questionnaire:

SA = Strongly Agree

A = Agree

SD = Strongly Disagree

D = Disagree

UD = Undecided

Table 5: Questionnaire Analysis

S/N	Questionnaire Items	SA	A	SD	D	UD
		5	**4**	**3**	**2**	**1**
	Technological Change (Technological Adaptation)					
1	I use modern technology in my work	21	23	11	24	3
2	My organization welcomes new equipments	11	20	31	20	-
3	I am allowed to suggest new ways of production to the	6	12	23	33	8

	organization					
4	My organization encourages me to master the use of new technologies	15	31	11	23	2
5	I am trained on using modern techniques	13	41	7	20	1
	Performance (Customer Retention)					
6	We record high rates of repeat patronage	12	29	17	20	4
7	Our customers always come back for more purchase	17	38	7	17	3
8	Customers declare their satisfaction with our products	23	34	2	15	8
9	Our old customers are still coming to purchase from us	12	23	9	32	6
10	Our customers refer others to us for purchase	8	47	1	23	3

Source: Field Survey, 2016

Table 11. 6: Descriptive Statistic Table

Descriptive Statistics

	N	Sum	Mean	Std. Deviation
QUES1	82	281	3.43	1.257
QUES2	82	267	3.26	.966
QUES3	82	221	2.70	1.074
QUES4	82	280	3.41	1.154
QUES5	82	291	3.55	1.068
QUES6	82	271	3.30	1.141
QUES7	82	295	3.60	1.142
QUES8	82	295	3.60	1.332
QUES9	82	248	3.02	1.237
QUES10	82	280	3.41	1.111

Valid N (listwise)	82

Source: SPSS, Ver. 20.

11.2 Test of Hypothesis

H_A: There is significant positive type of relationship that exists between technological adaptation and customer retention of the selected plastic manufacturing firms in Enugu State.

Table 11.6: Correlation Table

Correlations

		TECHNOLOGICAL ADAPTATION	CUSTOMER RETENTION
TECHNOLOGICAL ADAPTATION	Pearson Correlation	1	.984**
	Sig. (2-tailed)		.000
	N	82	82
CUSTOMER RETENTION	Pearson Correlation	.984**	1
	Sig. (2-tailed)	.000	
	N	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS, Ver. 20.

11.3 Conclusion

From the analysis carried out using a parametric analysis technique (Product Moment Correlation Coefficient), it is deduced that technology adaptation has significant positive relationship with customer retention of the selected manufacturing firms in Enugu State meaning that the relationship is a direct one; as one increases, the other one also increases and vice versa. This study therefore concludes that technological change has a significant relationship with the performance of the **plastic** manufacturing firms selected.

11.4 Recommendations

Since technological change has positive significant with the performance of the firms, the firms need to promote its performance, sustainability and also maintain a competitive advantage in the global economy. The researcher recommends the following:

1. The firms should be ready to adapt and evolve to new technology in order to provide more effective and efficient output which will aid in retaining customers.

2. Management should provide an advance notice to their employees concerning the new technology by explaining to them the objectives for the introduction of new technology. This will help lessen anxiety and resistance to change and improve performance.
3. The firms should also provide their employees with new skills associated with modern technology through retraining them so as to maximise the gains of adopting these technologies.

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