



TECHNOLOGICAL INNOVATION AND PERFORMANCE OF TECHNOLOGY BASED COMPANIES IN SOUTH-WEST, NIGERIA

Kingsley Osita Okonkwo

Department of Engineering Management, ESUT Business School,
Enugu State University of Science and Technology, Nigeria
okonkko@gmail.com

Innocent Ifeanyichukwu Eneh

Department of Electrical and Electronics Engineering,
Enugu State University of Science and Technology, Nigeria
doceneiee@yahoo.com

Anthony Obiora Ude

Department of Management,
University of Nigeria, Enugu Campus, Nigeria
obiora.ude@unn.edu.ng

Muna-Enwelu Helen Nneka

Department of Accountancy,
University of Nigeria, Enugu Campus, Nigeria
munaenweluhenenneka@gmail.com

Nkeiruka Claris Chukwu

Department of Accountancy,
University of Nigeria, Enugu Campus, Nigeria
chukwuclaris@gmail.com

Abstract

The study investigated technological innovation and performance of technology based companies in South-West, Nigeria. The specific objectives were to; determine the effect of E-learning platforms and customer satisfaction and ascertain the relationship between online shopping applications and market share of technology based companies in South-West, Nigeria. The study adopted the descriptive survey design. A sample size of 254 was selected from a population of 694 using the Taro Yamane's formular. The study made use of primary and secondary data sources while primary data were collected using structured questionnaire on a 5 point Likert Scale. The hypotheses were tested using t-test statistics and Regression analysis through Statistical Package for Social Sciences software. The findings revealed that E-learning platforms positively affected customer satisfaction ($r = 0.621$; < 0.05); and there was significant positive relationship between online shopping applications and the market share ($r = 0.622$; $p < 0.05$) of technology based companies in South-West, Nigeria. The study concludes that the importance of technological innovation on technology based companies which are tangible assets in the development and managing of ICT frameworks in Nigeria is highly justified. The study recommends among others that digital education platforms should be encouraged at all academic levels as it was discovered that E-Learning platforms positively affected customer satisfaction of technology based companies in South-West, Nigeria.

Keywords: Technological innovation, E-Learning Platforms, Online shopping Applications, Customer Satisfaction, Market share

INTRODUCTION

The relevance of knowledge based economy and globalized industries/markets are driving the developments and increase in technological innovative products and services. Since the beginning of the early 1980s the comprehensive development of the highly technologically driven knowledge economy and globalization induced international competition has increased the importance of technological innovation in both developing and developed economies (Camagni, 1995; Feldman, 1994; Malmberg, 1997; Porter, 1990; Ritsila, 1999 and Storper, 1995). These developments also highlighted the importance of entrepreneurship with obvious emphasis on technological innovation as the most important variable for regional, national and international wealth creators. The imperative of technological innovation as a source of new wealth creator for individuals and organizations has continued to generate considerable interest and discourse in the environment of business (Venkataraman, 2004).

The reason behind some regional and national economies being more advanced and developed than others lies on their systematic and successful deployment of technological innovation framework and structure. Schumpeter was the first to clearly opine that the core of technological innovation must tilt towards economic progress and prosperity. Innovation is important in the success of capitalism because it creates innovative change. Capitalism which is highly distinguished by a drive to discover new normal rather than stability as innovations keep emerging on the scene which reshape the existing structure and alter known equations in the industry environment. Not only is the continuous creativity distortion more acceptable than continuity in a capitalist economy, the distortion is also the ultimate source of greater social welfare as it brings new and better sources of wealth (Schumpeter, 1976; Venkataraman, 2004).

World Bank (2015) affirms that technological innovation and innovative Information and Communication Technology (ICT) products in organizations have already had an impact on economic performance among firms in developing countries, where technological innovation contributes positively to firm growth and development. Technology based innovative ICT products can be used to strengthen or replace existing information systems and networks and thereby open a new market for new businesses. Technological innovations promote and facilitate development by bringing about social and economic changes. Governments across the world advocate policies and programs that aim to bridge the digital divide by providing greater access to ICT in less-developed areas

In the Nigerian Business environment, technological innovation is currently at the forefront in National discourse with very impressive and remarkable achievements in the sector which has very high potential for sustained economic growth overtime. Danbatta (2019) affirms that the Nigerian Communications Commission (NCC) has expressed its belief that its efforts at promoting Information and Communication Technology (ICT) innovation and leveraging on emerging technologies will accelerate Federal Government's agenda to create jobs that will lift millions of Nigerians out of poverty and economic prosperity. He emphasized the central role of ICT Innovators, tech enthusiasts and tech entrepreneurs, whose activities will help in generating employment for the teeming youths, enhance ICT knowledge and skills, increase income and promote overall economic development in the country.

The ICT sector currently contributes 13.9 percent to the country's Gross Domestic Product (GDP), surpassing the contribution of oil and gas sector which is 8.8 percent of the nation's Gross Domestic Product as at October 2019. The telecom sector and by extension, the entire ICT industry has the potential to lift 100 million Nigerians out of poverty by 2030. ICT innovations have the transformational power to impact all sectors of the economy, to impact on

the quality of our lives and generate unprecedented wealth for Nigerians, individuals and corporate organizations operating in the sector (NBS, 2020).

Technological innovations are very vital to economic growth and prosperity as widely acknowledged both in developed and developing economies. Improved technological innovation has the potential of enhancing sustainable productive and inventive economic developments. Innovative ICT products are employment and wealth creators in the dynamic and knowledge based economies with obvious capacity for skill development. It is capable of providing the necessary skill gap in the technological sector of the economy with a positive effect in the combination of theoretical knowledge through learning and practical knowledge on the field of trade and business. The value of technological innovation on the sustainable economic implications of the technologically driven 21st century economic growth and development cannot be over emphasized. The rate of mortality of technology based companies has become a source of concern and worry for economic planners in many nations of the world. Nigeria is not isolated from this phenomenon and South-West Geo political zone remains an economic hub in the country with lots of technology based companies and their products/services that have gone down the drain. Currently, the fear of sustaining thriving technology based business concerns operating in South-West Nigeria necessitated this study so that the trans-generational problems experienced by other businesses in the region which currently prides itself as the economic capital of Nigeria can be curbed. The research outcome is intended to reverse the trend of Trans-generational failure of most businesses and technology based companies' in South-West, Nigeria and assist these performing and active technology based businesses to effectively transit beyond their founders' generation. The study therefore seeks to examine technological innovation and performance of technology based companies in South-West, Nigeria. The research output will expose the actual challenges to the stakeholders in technology based companies for the purpose of addressing them towards the efficiency and effectiveness of their next generational sustainability.

CONCEPTUAL REVIEW

Concept of Technological Innovation

Technological innovation is a new information technology based application that is not previously in use or a substantial adaptation or modification of an existing information technology based process. It involves the partial or full replacement of an existing technology by a newer system aimed at improving productivity, standard, quality and competitiveness of products and services. It was uncovered that small firm with ICT capabilities can improve their market intelligence practices by facilitating the acquisition of information about a specific

customer segment or a potential market niche, which can facilitate some innovative processes, such as the adaptation of their products or services and the implementation of new sales techniques, such as e-commerce (Dorf & Byers 2005).

The Role of Technological innovation in Social and Economic Development

A vast body of research exists on the importance and varied contributions of technological entrepreneurship to job creation, economic and social development, and growth. It was specifically stated and we quote as follows (Zahra & Hayton, 2007). Technological innovation is a key source of economic and social progress. It refers to the creation of new firms by independent entrepreneurs and corporations to exploit technological discoveries. These new firms create jobs, contribute to the well being of their communities and generate wealth for their owners. These firms are also the change makers in their respective industries as they bring in new technological paradigms that alter the dynamics of competition and rules of rivalry. Basically, both incremental and radical innovations are important not only for the positive economic impact they typically create, but also because they fundamentally change the behavior of consumers, often in ways that improve their lives.

Technological innovation Development in Nigeria

The literature on technological innovation is sparse in Nigeria and technological entrepreneurs are very few. For instance, in a study of technological and non-technological women entrepreneurs in South-Western Nigeria, the women in non-technological businesses were about twice as many as those in technological businesses (Aderemi, Ilori, Siyanbola, Adegbite & Abereijo, 2008). Entrepreneurs are catalysts of change in a market economy. They spur efficient use of resources and facilitate transactions between parties with different preferences and endowments. Central to entrepreneurial behaviour is the acceleration, generation, dissemination and application of innovative ideas. In the developing countries such as Nigeria, high level of entrepreneurship is important in reducing the adverse socioeconomic impacts by creating new employments. A society with a strong entrepreneurial culture have a positive influence on the rate at which new firms are created and their chances of survival and growth as well as the fate of already existing firms (Arzeni, 1998). In a more specific sense, entrepreneurship is the vehicle on which innovation, which is the application of knowledge in production, rides. Indeed, innovation is at the heart of entrepreneurship. Within this context, entrepreneurs are considered as “champions” of some sort who convert ideas into products and services and ultimately create wealth and reduce unemployment (Othman, Ghazali, Ezlika & Yeoh, 2006)

E-learning platforms and customer satisfaction of Technology based companies

E-Learning is the use of ICT to provide information and knowledge resources to learners by relinquishing time and geographic restrictions. The use of online resources has been blended together with modern education where information, communication, education and training is delivered online and this forms the foundation of e-learning. There are numerous benefits that organizations implementing e-learning can enjoy, such as cost savings, an improvement in the learning process, an increase in access to instructors for learners, accommodation of various learning styles, dynamic course content, and high-quality training that can be structured or unstructured. Applications of e-learning have been noticed in several areas, including primary and higher education and corporate training as well as training for government employees (Liw & Huang, 2013).

Online shopping applications and market share of Technology based companies

The internet provides new ways for customers to shop for their needs. Internet technology is available almost everywhere worldwide and using the internet for information is already the number one reason customers' state for being online. Internet technology allows products and services to be offered on a scale never possible before: a potential global market with a variety of choices that is simply not possible with limited physical floor space. E-retailers can now serve their customers twenty-four hours a day with variety of products and services at reduced price (Walsh & Godfrey, 2000). Though there are potential business benefits arising from the usage of Internet, successful e-retailing still face numerous challenges such as: improved customer service, increased competition and increased cost of website and content management. While these remain an important managerial challenge, there is also a changing wave of customers growing expectation for continuous improved products and service offering. Retail businesses should therefore take advantage of internet opportunities and build enduring customer-retailer relationship for a sustained customer loyalty. More personalized service that satisfies customers need can be developed and deployed into e-commerce environment (Windham & Orton, 2000).

THEORETICAL FRAMEWORK

Theory of Innovative Diffusion

The study is anchored on the theory of innovative diffusion. The market diffusion process describes how an innovation spreads through a market. According to Kotler (2012), adoption is an individual's decision to become a regular user of a product. He maintained that an innovation of any product, service or idea that is perceived by someone as new even when it has a long

history. Rogers (1983) as used in Kotler, (2012) defines Innovation diffusion process as the spread of a new idea from its source of invention or creation to its ultimate users or adopters.

Continuing, he maintained that innovations are not adopted by all individuals in a social system at the same time. Instead, they tend to adopt in a time sequence, and can be classified into adopter categories based upon how long it takes for them to begin using the new idea. Practically speaking, it's very useful for a change agent to be able to identify which category certain individuals belong to, since the short-term goal of most change agents is to facilitate the adoption of an innovation. Adoption of a new idea is caused by human interaction through interpersonal networks. If the initial adopter of an innovation discusses it with two members of a given social system, and these two become adopters who pass the innovation along to two peers, and so on, the resulting distribution follows a binomial expansion.

METHODOLOGY

The study adopted the descriptive survey design method and sample size of 254 was selected from a population of 694 using the Taro Yamane's formular. The study made use of primary and secondary data sources while primary data were collected through copies of self designed structured questionnaire to elicit responses based on the objectives of the study while analyses were represented in tables and percentages. The hypotheses were tested using t-test statistics and Regression analysis.

The study was conducted in five technology based companies in Lagos, South-West, Nigeria using purposive non-probability sampling technique on the key stakeholders. These technology based companies were selected because they are the major stakeholders in the geographical scope of the study. The instrument used for data collection was a structured questionnaire designed by the researcher. The copies of questionnaire were designed for easy comprehension of the respondents. It consists of two (2) Sections A and B. Section A will contain the demographic and personal information about the respondent. They include respondents' sex, age, marital status; educational qualification and part two consist of items of the research questions meant to be answered by the respondents. Concerning the survey scale, the quantitative close-ended statements were scaled according to the 5 point Likert Scale format, a technique designed to measure attitudes, typically using a continuum of "Strongly Disagree" to "Strongly Agree. This survey has a scale of five responses which are "Strongly Agree (SA)," "Agree (A)," "Undecided (U)" "Disagree (D)," and "Strongly Disagree (SD)."

ANALYSES & FINDINGS

In this part of the research, information generated through the distribution of well structured questionnaire was analyzed using the tabled frequencies and corresponding percentages of the demographic characteristics of the respondents. The hypotheses of the study were tested using Ordinary Least Squares (OLS) technique with the application of regression analysis. The statistical software employed is the E-view econometric software

Descriptive Analysis of Research Questions

Table 1. To what extent does E-learning platform affect customer satisfaction of technology based companies in South-West, Nigeria?

Responses	Frequency	Percentage %
Strongly Agree	119	49
Agree	105	43
Undecided	3	1
Disagree	6	2
Strongly disagree	8	3
Total	241	100

In the table above, 119(49%) of the respondents strongly agreed that E-learning platform affect customer satisfaction of technology based companies, 105(43%) agreed, 31(1%) are undecided, 6(2%) disagreed and 8(3%) strongly disagreed. This means that average majority of the respondents agreed that E-learning platform affect customer satisfaction of technology based companies in South-West, Nigeria

Table 2. What is the nature of the relationship between online shopping applications and the market share of technology based companies in South-West, Nigeria?

Responses	Frequency	Percentage %
Strongly Agree	119	49
Agree	105	43
Undecided	3	1
Disagree	6	2
Strongly disagree	8	3
Total	241	100

In the table 2, 119(49%) of the respondents strongly agreed that there is a positive relationship between online shopping applications and market share of technology based companies, 105(43%) agreed, 31(1%) are undecided, 6(2%) disagreed and 8(3%) strongly disagreed. This entails on the average that majority of the respondents agreed that there is a positive relationship between online shopping applications and the market share of technology based companies in South-West, Nigeria

Test of Hypotheses

Test of hypothesis one

H₀: E-learning platforms do not affect customer satisfaction of technology based companies in South-West, Nigeria.

H₁ E-learning platforms affect customer satisfaction of technology based companies in South-West, Nigeria.

Table 3. Hypothesis 1 testing result (E-views ouput)

Dependent Variable: CUSTOMER SATISFACTION				
Method: Least Squares				
Date: 07/15/2022 Time: 10:17				
Sample: 1 241				
Included observations: 241				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.350808.	3.400219	0.985468	0.3254
E-LEARNING PLATFORMS	0.621192	0.032170	19.30944	0.0000
R-squared	0.609384	Mean dependent var		20.72614
Adjusted R-squared	0.607750	S.D. dependent var		81.27694
S.E. of regression	50.90364	Akaike info criterion		10.70601
Sum squared resid	619292.2	Schwarz criterion		10.73493
Log likelihood	-1288.074	Hannan-Quinn criter.		10.71766
F-statistic	372.8547	Durbin-Watson stat		1.825809
Prob(F-statistic)	0.000000			

Model Line: CUSTOMER SATISFACTION = $b_0 + b_1$ E-LEARNING PLATFORMS + U

Regression Line: CUSTOMER SATISFACTION = 3.350808 + 0.621192 E-LEARNING PLATFORMS

Where; E-LEARNING PLATFORMS = E-learning Platforms, CUSTOMER SATISFACTION = Customer Satisfaction and U = Stochastic Error Term.

Table 3 displayed the regression output showing that the numerical coefficient of E-learning platforms yielded a positive value at the magnitude of 0.621192. This entails that a unit increase in E-learning applications leads to positive change in customer satisfaction by 0.621192. This reveals a positive relationship between the two variables. The coefficient of determination which measures the control power of the independent variable over the dependent variable is given as adjusted R-Squared (R^2) 0.607750. This implies that E-learning platforms explain 60.77% variation in customer satisfaction. This is the magnitude of approximately 61%. This is significant given that it is beyond average. The result shows also that E-learning platforms are statistically significant with p-value of 0.0000. We therefore reject the null hypothesis and accept the alternate hypothesis; Hence, E-learning platforms significantly affect customer satisfaction of ($r = 0.621$; $p < 0.05$) technology based companies in South-West, Nigeria.

Test of hypothesis two

H_0 : There is no positive relationship between online shopping applications and the market share of technology based companies in South-West, Nigeria.

H_1 There is a positive relationship between online shopping applications and the market share of technology based companies in South-West, Nigeria.

Table 3. Hypothesis 1 testing result (E-views output)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: MARKET SHARE				
Method: Least Squares				
Date: 07/15/2022 Time: 19:55				
Sample: 1 241				
Included observations: 241				
C	4.165906	3.381851	1.231842	0.2192
ONLINE SHOPPING APPLICATIONS	0.622225	0.032069	19.40296	0.0000
R-squared	0.611682	Mean dependent var		21.01245
Adjusted R-squared	0.610057	S.D. dependent var		81.25610
S.E. of regression	50.74070	Akaike info criterion		10.69960
Sum squared resid	615333.7	Schwarz criterion		10.72852
Log likelihood	-1287.302	Hannan-Quinn criter.		10.71125
F-statistic	376.4749	Durbin-Watson stat		1.836720
Prob(F-statistic)	0.000000			

Model Line: MARKET SHARE = $b_0 + b_1 \text{ONLINE SHOPPING APPLICATIONS} + U$

Regression Line: MARKET SHARE = $4.165906 + 0.622225 \text{ONLINE SHOPPING APPLICATIONS}$

Where; ONLINE SHOPPING APPLICATIONS = Online Shopping Applications, MARKET SHARE = Market Share and U = Stochastic Error Term.

It can be deduced from the regression table that there is a positive relationship between online shopping applications and market share. The coefficient of online shopping applications is estimated at 0.622225. This implies that for every unit increase in online shopping applications, market share will increase by 0.622225. The result shows also that online shopping application is statistically significant with p-value of 0.000. The adjusted R^2 is 0.610057. This means that 61% of the variation in market share can be explained by online shopping applications. The remaining 39% that is unaccounted for can be explained by other variables not considered here and also by randomness. We therefore accept the alternate hypothesis; Hence, There is a significant positive relationship between online shopping applications and the market share ($r = 0.622$; $p < 0.05$) of technology based companies in South-West, Nigeria

CONCLUSION AND RECOMMENDATIONS

The conclusion of the study is that the objective of the research which was aimed at examining technological innovation and performance of technology based companies in South-West, Nigeria was achieved in the long run. Though there could be some other issues that were not revealed that could be analyzed on the effect of technological innovation on the performance of technology based companies in South-West, Nigeria, the data from the questionnaire were explicitly in favour of the two objectives that were studied. The study justified the importance of technological innovation on technology based companies which are tangible assets in the development and managing of ICT frameworks in Nigeria. The variables of innovative ICT products studied include; E-learning platforms and online shopping applications were positive and significant in the performance of technology based companies induced proxies of customer satisfaction and market share of technology based companies in South-West, Nigeria.

Based on the findings, the following recommendations were made: Digital education platforms should be encouraged at all academic levels as it was discovered that E-Learning platforms positively affected customer satisfaction of technology based companies in South-West, Nigeria. It was equally recommended that businesses should leverage on various digital

platforms available to encourage online shopping because it was uncovered that there was a significant positive relationship between online shopping applications and market share of technology based companies in South-West, Nigeria

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