

ICT APPLICATION AS DRIVER OF PRODUCT DIFFERENTIATION IN NIGERIAN ORGANISATIONS

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Abstract

The study examined the influence of ICT applications on product differentiation in Nigerian organizations with a view of identifying the frequency of ICTs deployed, its influence on the companies' product differentiation and challenges. Despite the efforts put in place by government and managements of organisations, globalization, market liberalization and information technology continued to influence customers' tastes, preferences and brand consciousness such that customers demand for superior products and services at lower prices, which majority of the companies could not afford (Akpan, Ikon & Chukwunonye, 2016). This may be due to lack of production of varied products which suits consumers' needs and there is limited studies on the influence of product differentiation of Nigerian organisations, hence this study. The study employed survey research design. The population of the study comprised 500 organisations that engaged in different types of business which ranged from production, processing organisations, building, furniture, electronics, textiles, food, drinks and Pharmaceutical products in Nigeria. The sample size of 222 was determined, using Taro Yamane's formula. Simple random and stratified sampling technique was used to select 222 participating organisations for the study. Data was collected with structured and validated questionnaire. Cronbach's Alpha reliability value for the construct was greater than 0.70 internal consistency and the response rate was 88%.

Findings showed that ICT applications had significant influence on product differentiation across the organisations since P value is < .05. There were variations in the availability and use of ICT applications for product differentiation across organisations of different sizes. It was also found that use of ICT applications has assisted to foster the designing of quality varied products and this was reported to be low in small organisations compared to medium and larger organisations. The research recommended that organizations should improve on product differentiation by adopting ICT applications that will support product development, designing and production of quality varied products, build their human capacity resources by investing in training of staff and organise intensive seminar, workshop and conferences on IT training. It is also recommended that government and managements of organisations should work on policy intervention that will create an ICT friendly environment to support the use of ICT applications for production of different brands of products to suit customers' needs for enhanced competitive advantage.

Key Words : Driver, ICT application, Product Differentiation, Organisations

INTRODUCTION

In the 21st business environment, the source of achieving sustained competitive advantage has become a major concern of organisations in order to survive. Organizations all over the world are facing pressure of competition from the effects of global integration, market liberalization and technological advancement such that the sustainability, success and indeed survival of organizations increasingly depends on their competitiveness. Organizations compete for customers, revenue, market share with products and services that meet customer's needs. To achieve this, organisations must be able to devise business strategies that adequately match customers' needs, wants, desires, preferences and buying patterns with the organizational capabilities or core competence. Organisations' area of capabilities or core competence is defined as doing something better than, any other organization in the market. It could be provision of products or services which customers value and are able to give organization competitive edge over other competitors in the industry.

Competitive advantage is described as the superiority which could be offering lower cost quality products (cost advantage), or delivering benefits that exceed those of competing products (differentiation advantage) or focus strategy that one organisation has relative to other competitors. Competitive advantage exists when the firm is able to deliver the same benefits as competitors but at a lower cost). This study was limited to product differentiation and in particular, the influence of ICT application on product differentiation of Nigerian organisations. Product differentiation strategy can be a tool for organisations to gain competitive advantage especially in Nigeria where the present economic hardship continues to influence customers demand for quality products with lower prices. Product differentiation involves the firm creating a product/service, which is considered unique in some aspect that the customer values because the customer's needs are satisfied.

As organisations all over the world face intensive pressure of competition from the effects of globalization, market liberalization and technological advancement, customers' demand in terms of needs, tastes, buying pattern increase and organisations especially those in the advanced countries of Europe, USA, China, Germany, France, Russia tend to seek competitive advantage by producing quality products with more valued features. In cases where a stand out product was perceived as of high value, organisations used the stand out product to gain competitive advantage. To survive and remain competitive, Nigerian organizations are expected to differentiate their products by producing variety of quality goods and satisfactory services that customers value higher than those offered by competitors (Johnson, 2016). Product differentiation is the uniqueness in doing something that is sufficiently valued by customers to allow a price premium. It occurs when a product offered by an organization or services provided is considered by the customers to be unique to allow the organization to enjoy prices that is higher than average.

Various measures have been established by researchers as measure of product differentiation in organizations. Morgan, Kaleka & Katsikeas, (2004) used higher product quality, packaging, design and style while Chenhall and Langfield-Smith (1998) measured product differentiation by using strategy using provision of high quality products, fast deliveries, making changes in design, introducing new products and providing unique product features. Also, Abu-Aliqah (2012) in his study adopted high product quality, fast delivery, design and new products, and unique product features as measure of product differentiation. In the context of this study, product differentiation was measured by the ability of organisations to develop new products, differentiate products and services through innovative technologies, strong brand image identification as well as broad service products range and extensive strong branch network (Allen & Helms, 2016).

In Nigeria, many organisations are struggling to stay afloat and therefore to operate in tough economic conditions characterized by increasing inflation rates, high bank interest rates and increasing exchange rates (Adams, 2019). Organisations operating in Nigeria, among other in the developing countries striving to

compete with her products and services both at the local and global market have to deal with a number of key challenges. Evidence from literature has shown that globalization, market liberalization and information technology continued to influence customers' tastes, preferences and brand consciousness such that customers demand for varied superior products and services at lower prices, which majority of the companies could not meet (Akpan, Ikon & Chukwunonye, 2016). To be in competitive advantage position and survive, organizations operating in Nigeria must be able to align their business strategies most especially their capabilities or core competence to adequately focus on customers' varied needs, wants, desires, preferences and buying patterns

Recognising the value of organisations, production, processing and service significant contribution to the Gross Domestic Product (GDP) of both developed and developing countries, numerous reforms and strategies on ICT applications have been implemented to provide support and re-position it to produce quality products and render satisfactory services in the market. Few of these are approved and implemented National ICT Policy ICT Policy framework which put in place measures and mechanisms to accelerate broadband penetration and access, strengthen ICT security and standardisation, enhance management and efficient utilisation of spectrum and other scarce ICT resources to promote business process reduction of imported finished goods and encouraging foreign exchange savings by producing locally some of the imported consumer goods items (CBN, 2017), four-year Economic Recovery and Growth Plan (ERGP) launched by President Buhari in 2016 which was aimed at achieving greater global competitiveness in the production of consumer goods in vision 2020, introduction of trade liberalization scheme, which removes barriers to trade in goods originating from ECOWAS countries, land borders closure to protect the consumer goods organisations and liberalization of telecommunication services with no significant success record yet (Ekpo, 2014; Chete, Louis, Foluso, Adeyinka & Ogundele, 2018). In addition, government's initiatives and reforms to promote the adoption and application of ICTs in all sectors received slow acceptance and poor implementation across the business organisations.

Hence, Nigerian government continue to import virtually every product with increasing exchange rates at high cost which make the cost of products with its corresponding high inflation rates. Given the enormous potentials of ICT application to impact on organizational innovation and assist in designing and manufacturing quality varied products that customers value to allow organisations to gain higher than average prices, it becomes imperative for organisations to use ICT applications to achieve their product differentiation. Doglas (2017) defines ICT as a broad concept that includes Computer hardware and software, data communication as well as telecommunication technologies. ICT is an umbrella term for computers, internet, web technology and software applications such as Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), Decision Support System (DSS), Supply Chain Management (SCM), Expert System (ES) employed by organisations to enhance their operations and services.

Several scholars have established that ICT applications are drivers, enablers or cornerstones for the advancement of the business sector (Apiyo & Kiarie, 2018; Billon, Marco, & Lera-Lopez, 2017; Cirera, Lage, & Sabetti, 2016; Grazzi & Jung, 2015) and bedrock for the sector's growth (United Republic of Tanzania [URT], 2016). Studies have shown that the tremendous increasing ICT use in organisations has been vital in supporting the growth of the sector as well as its competitiveness (Banga & Velde, 2018). Feniser, Burg, Ivascu, Gherhes and Otel (2017) define Information Communication Technology (ICT) use as the application of ICTs such as Decision Support System (DSS), Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), Expert System (ES), Product Development Process (PDP) and Closed-Circuit Television (CCTV) in the operations and services of manufacturing companies in Lagos State.

ICT use has become indispensable for manufacturing companies to be competitive and survive in the market. Makhazat (2018) considers frequency of ICT use as an essential strategy that can assist manufacturing companies in designing and manufacturing new products, providing expert advice, production of quality goods, sharing products information and analysing business data for efficient decision making. ICT use

assists organisations including manufacturing companies to gain competitive advantage through increasing their ability to respond to consumers and suppliers requests, reducing transaction times, improving goods and services qualities, improving flexibility of production or service provision and improving information sharing (Organisation for Economic Co-operation and Development (OECD), 2015). ICTs is a source of innovative solutions for the competitive development of businesses and its integration in organisations increases opportunities to find innovative solutions for handling processes and product management (Diaz-Chao, 2015; Franco & Garcia, 2017).

However, review of literature revealed that study on ICT application to achieve product differentiation in Nigerian organisations is very scanty. Besides, most of the literature that discussed related studies focused more on position papers than empirical. It then becomes imperative to examine the influence of ICT application on product differentiation of organisations in Nigeria. This becomes more important especially now that Nigerian government incorporated policies aimed at achieving competitiveness in organisations as part of economic transformation agenda. In the context of this study, ICT application was measured by the types of ICT application available in the organization, the frequency of use and its influence on the achievement of product differentiation.

OBJECTIVES OF THE STUDY

The specific objectives of the study were:

- 1) to ascertain the extent of product differentiation of the participating organisations in Nigeria
- 2) to find out the types of ICT applications deployed to achieve product differentiation for enhanced organisational competitiveness
- 3) to find out the frequency of ICT application used to differentiate products
- 4) to find out the challenges of using ICT applications to achieve product differentiation for enhanced competitiveness
- 5) to determine the influence of ICT applications on product differentiation of participating organisations

RESEARCH QUESTIONS

This study focused on answering the following research questions;

- 1 To what extent are the participating organisations differentiate their products?
- 2 What are the types of ICT applications deployed to achieve product differentiation for enhanced organisational competitiveness?
- 3 What is the frequency of ICT applications used to achieve product differentiation for enhanced competitiveness in Nigerian organisations?
- 4 What are the challenges of using ICT applications to achieve product differentiation for enhanced competitiveness?

Null Hypotheses

The use of ICT applications has no significant influence on product differentiation of participating organisations to enhance competitiveness.

LITERATURE REVIEW

The generic strategies as developed by Porter (1980; 1985) for achieving a competitive advantage position by an organization are: product differentiation and cost leadership. Product differentiation being the most commonly used one of these two strategic typologies (Spencer, Joiner, and Salmon, 2009). Product differentiation involves the firm creating a product/service, which is considered unique in some aspect that the customer values because the customer's needs are satisfied. On the other hand, cost leadership emphasizes low cost relative to that of the competitors (Porter, 1980; 1985). He argued that cost leadership and differentiation strategies are mutually exclusive. This study is conducted on influence of ICT application on organisations' product differentiation. Nevertheless, past researches have shown that a number of the manufacturing organizations view the differentiation strategy as a more important and

distinct means to achieve competitive advantage in constrict to a low cost strategy (Kotha and Orne, 1989; Baines and Langfield-Smith, 2003).

CONCEPTUAL FRAMEWORK

ICT APPLICATION AND PRODUCT DIFFERENTIATION FOR ENHANCED COMPETITIVENESS

In recent years the concept of competitive advantage has taken center stage in discussions of organization performance because the major challenge of organizations is how to have a competitive advantage. Hence, organisations must be able to devise business strategies that adequately match customers' needs, wants, desires, preferences and buying patterns with the organizational capabilities or core competence. The types of ICTs used to support organisational operations vary from one firm to another. While some firms used advanced ICT tools such as PDP, CRM, DSS, CAD and CAM, others are using basic ones such as photocopier machines, landline phone, lap top and desk top and computers. Doglas (2017) defines ICT as a broad concept that includes IT (hardware/software), data communication (internet/broadband) as well as telecommunication (mobile). ICT is an umbrella term that encompasses radio, photocopier machines, landline phone, lap top and desk top computers, internet, websites, CCTV, software applications such as CAD, CAM, DSS, SCM, ES and e-mail employed by organisations to enhance performance and competitiveness. Makhazat (2018) considers utilization of ICT application as an essential strategy that can assist organisations in designing and manufacturing of new products, providing expert advice, monitoring and ensure production of quality goods, managing organization purchases and supply activities, reducing transaction cost so as to gain competitive advantage over the competitors.

The value of ICTs in business avenues can be likened to that of engine oil in supporting and maintaining motion. Like an engine, ICTs' usage boosts a firm's growth and helps in the transformation of business models (Barret, Davidson, Prabhu, & Vargo, 2015). Besides productivity, ICT applications are a key element of the promotion of diversification of organisational operations (Diaz-Chao, 2015; Jorgenson, Ho and Samuels, 2011). Understandably, the usage of ICTs in business activities is found to have an additional positive effect on diverse business activities (Grazzi & Jung, 2015). Few of the reviewed studies widely reported mobile phones as tools for enhancing firms' organisational operations and innovation compared to other ICT applications (Krone, Schumacher, & Dannenberg, 2014). Mwantimwa (2019) also considered mobile phones as multi-purpose communication tools which facilitate speedy organizational operations. However, in recent studies, effectiveness of using ICT application to gain competitive advantage in organizations has been measured in terms of computer, internet, e-mail, video-conferencing (United Nations Conference on Trade & Development, 2014; Erlandsson, 2015; Fadeyi, 2018). In their contributions, Barret et al. (2015), Cirera et al. (2016) and Eze and Chinedu-Eze (2018) posited that a positive and significant impact of ICT on firms' business can also be measured along the dimensions of a firm's products, processes and organizational practices.

RELEVANCE OF ICT APPLICATION

ICT applications support organisational operations by providing opportunities for organisation to come up with enhanced and innovative ways of expanding markets, improving performance and competitiveness (Grazzi & Jung, 2015). The use of ICT application has helped to increase opportunities to find innovative solutions for production of quality varied goods, product management and facilitate the usage of other technologies, hence allowing businesses to thrive in competitive markets (Franco & Garcia, 2017; Diaz-Chao, 2015; Kossai & Piget, 2014). Aside from above, Cirera et al.s' (2016) study revealed that the use of ICT application played vital roles in ensuring that all business models [such as business-to-business (B2B), business-to-consumer (B2C) and supply chain management (SCM)] function properly. Hence, bringing considerable changes to product development, marketing and process restructuring (Billon et al., 2017; Gerguri-Rashiti et al., 2015; Idota, Ueki, Bunno, Shinohara, & Tsuji, 2014). With the use of ICT applications, organisations are able to diversify their markets particularly through the internet where buying and selling of goods and services are done and ideas for new designs of products are acquired (Idota et al., 2014).

The use of ICT applications has become more important in achieving competitiveness in organisations. ICT application such as Enterprise Resource Planning (ERP) is a business management system which assist to integrate all functions of the units in the organization (David, 2015). ERP applicable allows managers from all functions or departments to have understanding of the operations throughout the organization (Marina, Marzanah, Fatima, Yusmadi & Salfarin, 2016). Most of ERP systems are designed around a number of modules, each of which can be stand alone or combined with others Few of the modules in the ERP system are finance, marketing, procurement, manufacturing, supplier management and human resource among other

modules. According to Marina et al. (2016), the finance module tracks financial information, such as accounts receivable and payable, payroll and other financial and management accounting information throughout the company, the manufacturing module tracks the flow of orders or product while the human resource module covers many human resource management activities which include planning, training and job allocation.

ERP system plays a vital role in gaining competitive advantage to organisation. It assists to improve customers' service by assisting to boost higher production and helped to make products available at the required place within the required time thereby helping organisations to achieve customer expectation and satisfaction, facilitates better inventory accuracy also reduces the set-up time by ensuring coordination of people, tools and machinery together with efficient use and maintenance of equipments.

ICT applications such as internet and e-mails are assist in receiving customers' feedback, promoting products and services, making purchases, documentation, customer data processing, organising in-coming orders, preparing invoices, creating and managing customers' databases (Arendt and Grabowski, 2018). Michael (2015) described Customer Relation Management (CRM) as the center of today's customer services, which assists organisations to gather intelligent reports about customer's preferences, needs, tastes and facilitate satisfactory customer service delivery. Southern and Tilley (2000) also highlighted the role of ICTs in customer services by pointing out their importance in all organisational activities and process, and their enhancement of communication and working patterns all of which produce better services for customers. ICT applications such as Computer Aided Design (CAD) supports designing of new products while Computer Aided Manufacturing (CAM) assists in manufacturing new varied products for enhanced competitiveness. Social media platform is another ICT applications that are becoming more important in the enhancement of organisational operations (Papa, Santoro, Tiraben, & Monge, 2018). Mwantimwa's (2019) study in Tanzania revealed that social media platforms play a crucial role in positively changing the model of marketing services and products, making it more affordable and enable them to receive feedback and product requests from customers. In all, Papa et al. (2018) highlighted few of the value of using ICT applications across organisational operations to include designing and redesigning of products, supporting products and services development, packaging and marketing diversification.

In addition, numerous studies (Cirera et al., 2016; Gerguri-Rashiti et al., 2015; Grazi & Jung, 2015) have noted that the size, number of highly educated employees, location and age of a firm are important determinants of ICT applications usage for organisational operations. Grazi and Jung (2015) revealed that larger, older, and multinational organisations with business models, knowledge of ICT application use, availability of incentives, core capabilities and appropriate business environment are more likely to adopt ICT application than those that are not. The authors further elaborated that the location of a firm becomes less relevant to customers after the adoption of ICTs since customer-business communication becomes easier. Similarly, Gerguri-Rashiti et al. (2015) suggested that the size of an organisation and presence of competent managers, high-skilled workforce, advanced business practices are likely to determine the use of ICT applications and the kinds of innovation in the organisation. The authors argued that from the findings of their study in Tanzania, bigger organisations in transition economies tend to carry out more innovation activities than smaller ones.

In addition to the above, the nature of a firm's ownership, knowledge and IT skill of staff, less financial constrained, and foreign-owned firms (Billon et al., 2017; Cirera et al., 2016; Papa et al., 2018) are more likely to determine the use ICT applications to enhance organisational competitiveness. This was partly evident in Uganda where large and medium-sized firms owned by foreigners were found to deploy Internet services more effectively than indigenous ones. Similarly, Franco and Garcia (2017) revealed that the presence of networking and other ICT experts are important predictors of ICT application use although their influence has been reported to be not significant enough. Implicitly, organizations need to make decisions with regards to using ICT applications to achieve product differentiation and enhanced competitive advantage.

This study was supported by Resource based theory developed by Porter (1980). Resource based theory believes that an organization's internal resources are of great significance to the maintenance of organization's competitive advantage and ability to create market advantage to make profits. The resource-based theory defined firm resources as all assets, capabilities, organizational processes, firm attributes,

information, knowledge controlled by a firm (Barney, 1991). The theory emphasises that a firm has competitive advantage when it creates a successful strategy based on firm resources that cannot be duplicated by a current or potential competitor. In addition, the theory states that for resource and capability to give monopoly positions, large market shares and competitive edge in the market, it must be rare, valuable, difficult to imitate, with no substitute, and not transferable.

The theory is of the view that the core capability, which is organizational resources is the source of organization sustainable competitive advantage which is unique and difficult to imitate by competitors. It has the full user value, able to create value, reduce costs and have the ability to provide support for the organization to access a number of markets. Prahalad and Hamel (1990) defined core capability as the accumulated knowledge of organization, especially about how to coordinate the different skills of production and the organic integration of a variety of technical flow of knowledge. The Resource Based Theory greatly enhances understanding of the nature and determinants. In the context of this study, the core capability is product differentiation. It is the uniqueness of an organisation to provide a product/service perceived by the customer to be of greater benefits and value compared to that of the competitors. The diagram below explains the conceptual model that guide the study.

Conceptual Model

Dependent variable: Product differentiation

Independent Variables: ICT Application

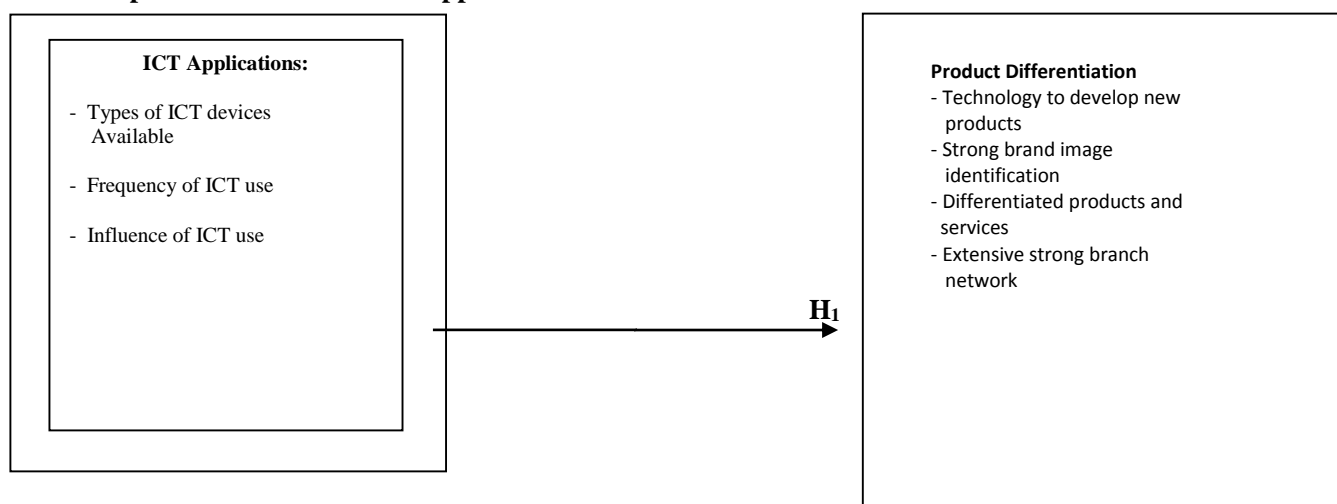


Figure 1: Conceptual Model showing ICT application as independent variable and Product differentiation as dependent variable

METHODOLOGY

The study was conducted during 2021 Lagos State International Trade Fair held from Friday 5th to Sunday 14th November, 2021 at Tafawa Balewa Square, Lagos, Nigeria. The participants of the Trade Fair study came from many parts of the world which include China, Japan, Ghana, Taiwan and Ethiopia to support their subsidiary organisations that engage in various business processes such as production, processing organisations, building, furniture, electronics, textiles, food, drinks and Pharmaceutical products in Nigeria. The event was an appropriate study setting because it brought together different organisations regardless of their sizes, nature and location to market their services and products at local and international market, hence facilitating information sharing, knowledge and acquisition and exchanging of innovative ideas (Rutageruka, 2017). In addition, the event made the collection of data more economical, convenient and assisted the researcher to get more appropriate sample for the study. The study adopted survey research design. The population of the study was 5,000 organisations operating in Nigeria. The sample size of 222 was determined, using Taro Yamane’s formula. Accordingly, both stratified and simple random sampling technique were employed in selecting samples from the multi-national and nationally-owned organisations operating in Nigeria that participated in the Trade Fair. Firstly, the firms were sub-divided into strata based on the pavilions they showcase their services and products. Secondly, from each stratum, the multi-national and nationally-owned organisations

were randomly selected for the purpose of enhancing representative sample.

Primary data were collected by using self-constructed questionnaires and interview while secondary data were obtained from journals and internet. The questionnaire used was divided into sections A and B and designed in a 5 point Likert scale. Section ‘A’ contained information about firms’ profiles while section B contained information about types of ICT applications used, frequency of use, influence of use and the challenges of using ICT applications in the organisations to achieve product differentiation and enhanced competitiveness. Two hundred and twenty-two copies of the questionnaire were administered while one hundred and ninety-five copies were duly completed and returned, representing 88% response rate. The data collected were presented and analyzed with descriptive statistic (e.g. frequency and percentage). Pilot test was also conducted to measure the internal consistency of the instruments and the Cronbach’s Alpha reliability value ranged between 0.70 and 0.845, which Franco and Garcia (2017) recommended as reliable instrument.

Results and Discussion of Findings

This section shows the participating organisations’ profiles, the types of ICT applications available in the organisations, the frequency of their usage, influence of use and the challenges faced in achieving products differentiation.

Profile of the Organisations

The profile of the organization which comprised year of establishment, business types, size of the organisations and ownership are presented and interpreted appropriately in table 1.

Table 1: Respondents’ demographic information

Distribution of Organisations by Year of establishment		
Age	Frequency	Percentage %
Less than 11 years	48	24.6
12-21 years	74	38.0
22-31 years	60	30.7
Above 32 years and above	13	6.7
Total	195	100.0
Distribution of Organisations by Type of Business		
Type of Business	Frequency	Percentage %
Service Provision	9	4.6
Production/Manufacturing	49	25.1
Processing	29	14.9
Agric and Agro Allied Products	49	25.1
Energy/ ICT Products/Power Plant	39	20.0
Real Estate, Building, Furniture, Fittings	20	10.3
Total	195	100.0
Distribution of Organisations by Size		
Operational status	Frequency	Percentage %
Large Org.	127	65.4
Medium Org.	23	12.1
Smaller Org.	45	22.5
Total	195	100.0
Distribution of Ownership of Org.		
Ownership	Frequency	Percentage %
Private	107	55.0
Fed./State/Local govt.	20	10.0
Foreign Multinational and Conglomerates	68	35.0
Total	195	100.0

Source: Field Study, 2021

The data collected were analysed by using descriptive statistics to reveal the profile of the participating organisations. The results in table 1 indicate that (75.4%) of the organisations (n=147) were established between 12 and 32 years while only (24.6%) of them (n=48) were established less than 11 years ago. This implies that most of the participating organisations have been operating in the business for considerable period of time and have significant experience in providing services. The results also show that the organisations engaged in manufacturing, processing, agriculture and agro-allied products, real estate, building, furniture, fittings, energy/ ICT products/power plant and services such as banking and Insurance and transportation. The finding also shows that a significant percentage of the organisation engaged in production/manufacturing, agric and agro-allied products, Energy/ ICT Products/Power Plant and processing while few percentage engaged in service production and real estate.

On the size of the organisations, 65.4% of them (n=127) were large organisations, 12.1% (n=23) were medium while 22.5% (n=45) were smaller organisations. This representation can be attributed to the ability of the larger organisations to afford the trade fair's participation fees than their smaller counterparts. Regarding the ownership, 55.0% of the organisations (n=107) were private owned, 10% were either federal, state or local government owned (n=20) while 35% were owned by the multi nationals and the conglomerates (n=68). It is important to note that federal, state and local government had lower ownership because government is not actively involved in investing but promoting private ownership.

Descriptive Analysis

Research Question 1: To what extent are the participating organisations differentiate their products? Table 2 shows the respondents views on the extent to which participating organisations differentiate products. Table 2 below shows the result of data collected

Table 2: Product differentiation in participating Organisations

Cost Leadership My company ...		Very High Extent 5	High Extent 4	Moderate Extent 3	Low Extent 2	Very Low Extent 1	Mean	Std. Dev.
Differentiation								
1	Maintains strong brand image identification that cannot be easily imitated.	11(5.4)	15(7.7)	25(12.8)	47(24.1)	97(50.0)	1.94 (1.72)	1.19
2	Carries out innovation with superior technology to differentiate products.	8(4.1)	10(5.1)	26(13.3)	51(26.2)	100(51.3)	1.85 (1.62)	1.10
3	Has strong branch network that is easily accessible as a differentiation strategy.	7(3.8)	12(6.4)	20(10.3)	58(29.7)	98(50.0)	1.84 (1.61)	1.08
4	Customizes products to suit varied needs of consumers.	6(3.1)	7(3.8)	21(10.8)	57(29.0)	104(53.3)	1.74 (1.53)	1.00
5	Uses superior technology frequently to develop new products.	3(1.3)	5(2.6)	7(3.8)	60(30.8)	120(61.5)	1.51 (1.33)	.80
Group Mean = 1.68								

*****Decision Rule: If mean falls between 1.0-2.33 = Low; 2.34-3.67 = Moderate; 3.68-5.0 = High**
Source: Field Survey, 2020*Decision Rule: If mean falls between 1.0-2.33 = Low; 2.34-3.67 = Moderate; 3.68-5.0 = High**
Source: Field Survey, 2021

Table 2 shows the descriptive statistic result for research question one. The result shows that with the overall mean value of 1.68, the extent at which organisations carried out innovation with superior technology to differentiate products was low. This situation could be due to the fact that the participating organisations performed poorly in areas such as using superior technology frequently to design new products and manufacture varied quality products which customers value higher than those offered by competitors. Similarly, Similarly, the level of attractiveness of companies' brand image identification was low with mean

value of 1.94 level of consumers’ accessibility to organisations’ branch network was also low with mean value of 1.84 on a 5 points scale. These results therefore suggest the need for organisations to enhance their product differentiation by using superior technology to design and manufacture new products that are tailored to customers’ needs, maintain strong brand image that cannot be easily imitated and customize products to suits varied needs of customers. The above finding also corroborates that of Chete, Louis, Foluso, Adeyinka and Ogundele (2018) which reported that cost leadership and product differentiation competitiveness in organisations operating in Nigeria was low and the various developmental plans and strategies aimed at improving productivity in the sector and make it competitive have proved abortive. Chete et al. attributed this to lack of innovative technology to develop new products and differentiate products/services to reduce wastages, low cost effective, innovative capability and low source of capital. This finding is also in agreement with Akpan and Chukwuma’s (2016) study which found that neither are most organisations in Nigeria could afford the customers’ demand for superior products and services at lower prices nor produce enough branded products that will be attractive to the customers to pay premium price. Hence, their capability to produce different products that will suit customers’ satisfaction to the level of paying higher prices is lacking.

Regarding the extent at which organisations carried out innovation with superior technology to differentiate products, finding revealed that the extent was low with the mean of 1.68. This finding is consistent with Shirur et al.’s (2015) study in South India, which reported that the capacity utilization and information technology to boost the performance of organisations for healthy competition was inadequate. This implies that most of the organisations did not invest in information technology to drive their competitiveness by producing varied products to the satisfaction of the customers. Similarly, the level of attractiveness of companies’ brand image identification was low with mean value of 1.94 level of consumers’ accessibility to companies branch network was also low with mean value of 1.84 on a 5 points scale. The finding of the study also supports Cirera et al.’s (2016) study which revealed that poor performance of Nigerian manufacturing sector was due to lack of investment in ICT, inadequate human capacity development, under-utilization and lack of information technology to boost local manufacturing operations. This implies that a large number of the organisations could not produce different brand of products that suits customers’ needs to drive their competitiveness due to lack of necessary ICT software applications.

Research Question Two: What are the types of ICT applications available for achieving product differentiation in the participating organisations? Table 3 shows respondents’ agreement or disagreement with the statements on the type of ICT devices available in the organisations with regards to the variables listed below

Table 3: Shows the descriptive statistic of type of ICT applications available for use to achieve product differentiation in organisations

	Types of ICT applications available in my organisations	Percentage of Responses (Large)	Percentage of Responses (Medium)	Percentage of Responses (Smaller)
	ICT Applications Available for use in my organisations			
I	Mobile phone	96.8%	85.3%	75.5% 85.9
Ii	Landline phone	85.2%	72.4%	65.6% 74.4
Iii	Expert System (ES)	75.5%	43.5%	25.6% 48.2
iv	Computer	87.5%	65.9%	60.5% 71.3
Vi	EFD Machine	73.6%	35.6%	25.5% 49.9
Vii	Customer Relationship Management (CRM)	86.5%	50.6%	35.6% 55.9
viii	Computer Aided Design (CAD)	86.6%	41.5%	20.5% 56.2
Ix	Computer Aided Manufacture (CAM)	75.8%	40.5%	25.5% 50.6
X	Decision Support System (DSS)	85.5%	42.5%	30.8% 56.2
B	Photocopier Machine	98.4%	72.6%	70.5% 80.5
C	E-mail	85.6%	68.2%	65.5% 53.1
D	Organisational Websites	75.5%	52.3%	40.5% 55.1
E	Internet	96.4%	62.3%	50.5% 73.1
F	Social Media	85.0%	65.0%	55.0%
G	Product development process	75.5%	41.5%	37.5% 51.5
H				
I				
K				
L	Others (Specify)	-----	-----	

Respondents were asked in Table 2 to indicate their agreements or disagreement on the type of ICT applications available for use in the organisations to achieve product differentiation. The result reveals that mobile phone, landline phone, photocopier machine, websites, e-mail, computer, internet, Electronic Fiscal Device (EFD) Machine and applications such as PDP, CRM, DSS, CAD and CAM were available in the organisations but in different proportions. The result also reveals that just a few of the ICT applications owned by the organisations especially the smaller and few medium organisations were found useful in supporting product differentiation in the organisations. Implicitly, ICTs applications such as Computer Aided Design (CAD) to develop new quality varied products, Computer Aided Manufacturing (CAM) to produce different brands of quality products, Product Development Process (PDP) to monitor production quality, Consumer Relation Management (CRM) to gather intelligence information about customers preferences and Expert System (ES) to provide expert advice were not available in the smaller and few of the medium organisations, hence did not have access to use them. This result suggests that most of the medium and smaller organisations used the basic ICT applications such as mobile phone, landline phone, photocopier machine, websites, e-mail and computer. In addition, the results revealed that a larger percentage of the organisations subscribed to Internet services while only a small percentage of them have barometric machines.

The findings of this study is in agreement with earlier studies by Pollaris and Gresson (2018), Olasunkanmi (2018), Okon (2018). Franco and Garcia (2017), Olugbade (2016), Madonsela and Mbohwa (2017). Kuffour' (2017) study in the developing countries including Nigeria revealed that the adoption of ICT applications are still lagging behind in the developing countries compared with the developed countries. The study was also corroborate that of Okon's (2018) which rated the Nigerian organisations 2nd in internet penetration behind South Africa and Ghana and explained further that the network penetration level of Nigerian organisations was still low at 29% which is not more than half of South Africa network penetration. This suggests that the ICT applications available to assist in producing varied quality products in organisations operating in Nigeria was low. It can also be deduced from the findings that investments in some areas of ICT applications was low as most organisations only used the basic ICT applications such as mobile phone, internet, e-mail, computer and social media without investing in ICT applications such as CAD, CAM, MIS, ES, PDP, ERP, DSS. Similarly, many other studies (Apiyo & Kiarie, 2018; Ssewanyama & Busler, 2007) also support the findings that computers and internet are highly deployed in medium and larger firms than in smaller ones. Above all, the overall results show that more ICT applications were available in few medium and larger organisations but low in smaller organisations. Hence there is need to invest more in ICT applications such as CAD, CAM, MIS, ES, PDP, ERP, DSS to boost production of quality differentiated products and software that will assist to show case the products.

Research Question 3: What is the frequency of ICT applications used to achieve product differentiation for enhanced organisational competitiveness in Nigerian organisation ?

Table 4 shows respondents' views on the frequency of ICT application in the organisations with regards to the variables listed in Table 3 below;

Table 4: Frequency of ICT application in achieving product differentiation.

My organisation frequently use:		Always 4	Often 3	Not Often 2	Never 1	Mean
1	Internet	92(47.4)	70(35.9)	20(10.3)	13(6.4)	3.24
2	Mobile phone	75(38.5)	92(47.4)	18(9.0)	10(5.1)	3.19
3	Photocopier	74(37.9)	89(45.6)	20(10.3)	12(6.2)	3.15
4	Computer	78(40.0)	73(37.2)	32(16.4)	12(6.4)	3.11
5	Landline phone	78(40.0)	73(37.2)	32(16.4)	12(6.4)	3.10
6	Expert System (ES)	18(9.0)	75(38.5)	35(17.9)	67(34.6)	2.19
7	Customer Relation Management (CRM)	12(6.2)	30(15.3)	93(47.7)	60(30.8)	1.97
8	Product Development Process (PDP)	75(38.5)	25(12.8)	88(44.9)	7(3.8)	2.86
9	Electronics Fiscal Device (EFD)	73(37.4)	20(10.3)	93(47.7)	9(4.6)	2.81
10	Computer Aided Design (CAD)	15(7.7)	92(47.4)	25(12.8)	63(32.1)	2.30
11	Websites.	15(7.7)	91(46.7)	25(12.8)	64(32.8)	2.89
12	Computer Aided Manufacturing (CAM)	15(7.7)	84(43.1)	28(14.3)	68(34.9)	2.24
13	E-mail.	20(10.3)	86(44.1)	20(10.3)	69(35.4)	3.13
14	Decision Support System (DSS)	13(6.4)	98(50.3)	22(11.5)	62(31.8)	2.32

ICT Application Overall Mean=.

(*Decision Rule: If mean falls between 1.0-1.75 = Very Low; 1.76-2.50 = Low ; 2.51-3.25 =Moderate; 3.26-4.00=High**

Source: Field Survey, 2020

Respondents were asked to indicate their views on the frequency at which ICT applications were used in their organisations to differentiate products. The result in Table 3 shows that overall frequency of ICT applications used was low with mean score of 2.22. Findings from the study further shows that mobile phone (n=3.19), landline phone (n=3.10), photocopier machine (n=3.15), computer (n=3.11), internet (n=3.24) and e-mail (n=3.13) were used always or often by all the organisations used for the study. The result also shows that the frequency of ICT applications to differentiate products in the surveyed organisations varies. Most of the smaller and few medium organisations used ICT applications such as mobile phones, computers, Electronic Fiscal Device (EFD) machine, landline telephones, photocopier machine and websites frequently to achieve product differentiation while the larger organisations and smaller proportion of the medium organisations deployed ICT software applications such as Product Development Process (PDP) to monitor production quality, Expert System (ES) to provide expert advice, Resource Planning System (RPS) for efficient resources utilization, Computer-aided design (CAD), Organisational websites to show-case products and Computer-aided manufacturing (CAM) meant to produce quality goods/service were either used always or often. Finding also shows that computers and internet services were used more in medium and large-sized firms than in small ones.

Finding also shows that all the organisations involved in the study used mobile phone and social media perhaps because they provided platforms such as WhatsApp, Facebook, Twitter and Instagram to support promotion of their products and services. In all, the low frequency of ICT applications used to support product differentiation may be due to lack of ICT software application in most of the organisations especially the smaller ones. The study suggests that organisations need to invest on procurement of ICT software applications such as CAD, CAM, ES, PDP, ERP and DS to improve on the frequency of use and boost production of branded products that are value by customers to allow premium prices. The findings of this study agree with OECD's (2015) study which found that ICT application such as mobile phone, landline, computer, internet and e-mail and photocopier machine were available in all kinds and sizes of firms than applications such as CAD, CAM, ERP, CRM and DSS. The finding is also in line with that of Papa, Santoro, Tiraben and Monge's (2018) study which found that mobile phone and e-mail were used very often than other ICT software and applications in the organisations to drive competitiveness. The finding also corroborates Mwantimwa's (2019) study in Tanzania which attributed the reasons for dwindling prices of mobile phones, photocopier machines and computer to their multiple uses, being users friendly and easy to learn.

Similarly, the finding supports Makhazat's (2018) study which found that Nigerian textile industries neither had nor use ICT applications such as CAD, CAM, MIS, ES, PDP, ERP, DSS. to their advantage to enhance and achieve their objectives. The finding is also in agreement with Papa et al. (2018) and Mwantimwa's (2019) studies which revealed that social media platforms play a crucial role in positively changing the model of marketing services and products, making it more affordable and enable them to receive feedback and product requests from customers. Hence, it can also be deduced from the overall mean value of 2.22 that frequency of ICT application was high in the larger organisations including the multi-national organisations while most smaller and medium organisations use the basic ICTs such as mobile phone, internet, e-mail, computer and landline phone which were not wholly useful to differentiate their products.

Research Question 4: What are the challenges to effective use of ICT applications to achieve product differentiation in the participating organisations? Respondents were asked to indicate their views on the challenges facing the use of ICT application to support product differentiation in their organisations.

Table 5: Challenges to effective use of ICT applications to achieve product differentiation

Challenges to effective use of ICT applications to differentiate products	Frequency	Percentage (%) Agree
Inadequate investment in staff training for new IT technology	166	85%
Cost of procurement and delivery of ICT equipment and productivity gain	176	90%
Poor network and unstable internet connection	142	73%
Security of data, identities and personal information safety	123	63%
System integration	166	85%
Accessibility	162	83%
Poor infrastructural facilities	185	95%
Loan facilities and interest rate	176	90%
Unreliable power supply	166	85%
Unfriendly regulatory government policy	166	85%

Source: Field work, 2021.

Table 5 above shows the challenges to effective use of ICT applications to achieve product differentiation in organisations. The result of findings revealed that 85% found inadequate staff training for new IT technology as a challenge, 90% indicated cost of procurement and delivery of ICT equipment and productivity gain while 73% pointed out poor network and unstable internet connection. In addition to the above, 63% of the respondents reported security of data, identities and personal information safety, followed by system integration challenge with 85% responses, poor accessibility with 83% responses, poor infrastructural facilities with 95%, loan facilities and interest rate with 90%, unreliable power supply challenge indicated by 85% and unfriendly regulatory government policy have been found to insignificantly hinder the with 85%. In all, the results suggest that the use of ICT applications to achieve product differentiation is not highly promising due to both internal and external challenges faced by the participating organisations.

The result of this study is in line with Gerguri-Rashiti et al. (2015) finding which revealed that so long investment in broadband networks is low, bandwidth and unreliable networking remain as challenges, organisations will find it difficult to embark on innovative projects. The result also supports Michael (2015) study which reported that even organisations that invested on quality ICT facilities might have their use undermined by factors such as the availability of ICT experts, politics and low financial capacity. Similarly, Cirera et al. (2016) noted that insufficient investment in IT skill acquisition, high cost of procuring ICT applications, poor ICT infrastructure were found to significantly hinder the effective use of ICT application to support product differentiation business in organisations. The authors argued further that very often, lack of skills and inadequate awareness among staff on the type of ICT applications to support performance and boost innovation constitute barriers to effective use of ICT application in the organisation. The result of the study also corroborate Michael, Papa et al., (2018) and Mwantimwa (2019) reports of studies which identified unfriendly regulatory frameworks such as import taxes, VAT, business policies and long procedures for importing ICT equipment as major impediment for small organisations to use ICT applications, computers and internet services. Also in line with the findings of this study, Franco and Garcia (2017) and Billon et al. (2017) argued that poor technological savvy, insufficient management and financial resources to acquire modern ICT software applications and facilities were factors responsible for low use of ICT applications to achieve product differentiation in organisations. In addition to the above, the finding also corroborates Chete, Louis, Foluso and Ogundele's (2018) study which revealed that many of the organisations especially the smaller and medium ones do not have frameworks to guide deployment of ICT application appropriately to produce innovative

products. Without legal and policy frameworks, organisations cannot effectively operate optimally. From the findings above, one can deduce that depending on the size and years of establishment, each organization has her peculiar challenges but the basic challenges that cut across the smaller and medium organisations range from financial constraints, to inadequate investment in staff training, poor infrastructural facilities, loan facilities and interest rate, unreliable power supply, system integration, accessibility, cost of procurement and delivery of ICT equipment

Hypothesis Testing

Hypothesis One: ICT application has no significant influence on product differentiation in organisations

Hypothesis one tested the assumption that ICT application has no significant influence on product differentiation in the participating organisations. Simple linear regression analysis was used to analyse the data collected and the results are reported in table 6 below

Table 6: Simple linear regression analysis of the influence of use of ICT on competitiveness

Predictors	Unstandardized Coefficients	Standardized Coefficients (β)	T	Sig.
(Constant)	.975		6.534	.000*
Use of ICT	.243	.243	4.933	.000*
Dependent Variable: Competitiveness				

$R^2 = .059$, $R^2 = .057$, Adjusted $F = 24.336$, $DF = 1, 388$, $P < .05$

Table 6 reveals that 5.9% of the variation in the dependent variable (product differentiation) is explained by the independent variable (ICT applications). The result indicates that ICT applications ($\beta=0.243$, $p < 0.05$) significantly influenced product differentiation ($F(1, 388) = 24.336$, $p < 0.05$) in the organisations. Therefore, the null hypothesis was hereby rejected because the result indicated that ICT application significantly influenced product differentiation in organisations. Hence, organisations that failed to integrate ICT applications into their organizational practices and operations to produce varied products to suit customers' needs will be less competitive. This result therefore suggests that ICT applications should be integrated and adequately used across all departments and units of organisations to assist in designing and producing varied quality products that have high flexibility and valued by the customers to attract premium prices.

Further to the above, this finding corroborates that of Robinson (2016) who reported that with new developments in information technology, ICT applications such as computer aided designs and computer aided manufacturing had assisted organisations in designing and manufacturing of new quality varied products. Similarly, the finding also supports Franco and Garcia (2017) study which found that ICT applications were source of innovative solution to achieve sustainable competitive advantage for organisations. Several other studies such as Pradhan and Hamel (2015), Bankole et al. (2015), Agu, Nweze and Enekwe (2016), Feniser et al. (2017), Onobrakpeya et al. (2018) have also substantiated empirical results about the positive influence of ICT application to give organisations competitive advantage. In addition, the result of study conducted by Dirisu et al. (2013) showed that product differentiation had positive and significant influence on organizational performance of manufacturing companies in Nigeria. The result supports some previous research results (for example, Mosakowski 1993; Allen and Helms 2002), which indicated a positive and significant relationship between product differentiation strategy and organizational performance.

Similarly, studies of Okon (2018) and Olasunkanmi (2018) were also in agreement with the finding of this study. Okon (2018) observed that the use of ICT applications to enhance competitiveness in Sub-sahara Africa organisations was particularly weak and currently at low ebb. Also, Olasunkanmi (2018) examined ICT application of organisations for higher performance in Nigerian manufacturing sector and found that the potency of ICT application use in shaping and sustaining strategies for enhanced competitiveness was low. Consequently, this study concluded that ICT application is indispensable for organisations to produce varied quality products that is highly valued by customers to allow for premium prices and make the organization competitive and survive in the market.

Summary of Findings

Simple linear regression analysis test performed reveals that ICT applications had significant influence on product differentiation across the organisations since P value is $< .05$.

Secondly, there was variations in the availability and use of ICT applications for product differentiation across organisations of different sizes.

Finally, it was found that the use of ICT applications has assisted to foster the designing of quality varied products and this was reported to be low in small organisations compared to medium and larger organisations.

Conclusion and recommendations

Information and communication technologies are basic assets needed by organisations as an important tool to foster marketing efficiency and increased competitiveness. This study established that use of ICT applications is important in supporting organisations of all sizes to produce varied quality products that suits consumers' needs. In particular, the use of ICT application has given all sizes of organisations most especially the smaller firms opportunity to support their innovative activities. However, it is noteworthy that most of the ICT applications available in the smaller and few of the medium organization such as mobile phone, landline phone, photocopier machine, computer, internet and e-mail were not useful to differentiate their products. The ICT applications such as Computer Aided Design (CAD) meant to develop/design new products, Computer Aided Manufacturing (CAM) meant to produce varied quality products, Product Development Process (PDP) meant to monitor production of different types of quality products, Resource Planning System (RPS) designed for efficient resources utilization were only found in larger and few medium organisations and this was a big challenge to the achievement of producing different brands of products by the organisations. To be competitive and remain in Nigerian tough economic environment that is characterized by increasing inflation rates, high bank interest rates and increasing exchange rates, organisations need to produce varied quality products that are sufficiently valued by customers to allow a price premium. In view of the findings of this study, the following recommendations are suggested for policy intervention:

- 1)Organizations should improve on product differentiation by adopting ICT applications that will support product development, designing and production of quality varied products.
- 2)Management of organisations should build their human capacity resources by investing in training of staff and organize intensive seminar, workshop and conferences on IT training.
- 3)Government and managements of organisations should work on policy intervention that will create an ICT friendly environment to support the use of ICT applications for production of different brands of products that suit customers' needs for enhanced competitive advantage.

It is imperative for organisations to improve on how to develop varied quality products that are tailored to consumers' needs by adopting ICT applications that could support product development and resource planning.

Organisations should to build their human capacity by investing in training of staff to acquire IT skills required to use ICT applications optimally for product differentiation.

Management of organisations should take some urgent steps to stem the low use of ICT applications in the areas such as product development process, developing/designing new products, production of varied quality products and efficient resources utilization to enhance product differentiation

Lastly, government and management of organisations should work on policy intervention that will create an ICT friendly environment and improve infrastructure to support the use of ICT applications to achieve product differentiation by modifying the current restrictive regulatory frameworks..

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