

## Effects of the Use of ICT on Pharmaceutical Product Marketing in Nigeria

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### ABSTRACT:

This paper discussed the application of Information and Communication Technology (ICT) in pharmaceutical product marketing in Nigeria. Data for the study was obtained from 76 pharmaceutical firms in southwest Nigeria which comprised of about 95% of the pharmaceutical companies that were into manufacturing of drugs in Nigeria. The categories of firms surveyed include retail pharmacy, combination of wholesale and retail pharmacy, wholesale pharmacy, and manufacturing pharmaceutical companies that were also involved in drug importation or contract manufacturing. The study found that pharmaceutical companies were using considerable ICT for their product marketing especially customized software. However, there was no explicit guideline and policy for the usage of ICT for marketing pharmaceutical product in companies. Furthermore, while ICT did improve both the efficiency and effectiveness of the decision-making process through the use of software packages, frequency of training was strongly and positively correlated with effectiveness in ICT adoption for marketing and literacy level. The paper concluded that though increase in the adoption of ICT will continue to change the structure, content and quality of product marketing operations, adequate education and policy for deliberate training particularly for production and marketing activities in the industry cannot be overemphasized.

**Keywords:** *ICT, Pharmaceutical, Product, Marketing, Training, Policy*

### INTRODUCTION

Product marketing from time immemorial had involved the use of voice, acting, beating of drums, writing, printing, distribution of pamphlets, magazine, newspapers, handbills and posters amongst others. However, with advances in education and information technology, there has been rapid and dynamic revolution which

includes the use of decision support system and control functions that determine the way firms carry out their marketing operations. This is more important in the pharmaceutical industry where several tragedies had previously been recorded and thus warranted more caution on the part of all stakeholders. Particularly, for young

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firms and new entrants in the sector, the issue of product marketing, IT and education is key to overcoming the fundamental challenges of economies of scale in manufacturing, research and development and market share; financial and human resources; as well as standardization and policy regulation. Globally, the pharmaceutical sector is strictly regulated, virile and very competitive. According to Business Monitor International (BMI, 2014), Nigeria pharmaceutical industry contributes about 5% to GDP or US\$7.396 billion (₦ 1.109 trillion PPP) compared to a GDP contribution of about 8.5% in South Africa. The industry worth was about US\$ 600million in 2009 and was projected to grow substantially at about 12% annually to reach US\$ 717 million by 2011 (UNIDO, 2011). Eight (8) out of 71 companies registered as active members of the Pharmaceutical Manufacturing Group (PMG) in 2010 and are listed on the Nigerian Stock Exchange.

Changes in the business workflow process call for tools that assist employees and managers in accessing data critical to their work. Decentralization of data and work decision making requires an efficient communication system. Especially with the increase in urbanization, per capital income and non-communicable diseases driving the demand for medicines; one has reason to believe that pharmaceutical product marketing in Nigeria will need ICT to make healthcare more accessible and widespread throughout the country and beyond (BMI, 2014). Information technology has already revolutionized every sector and world of work (Aderemi, 2006). Areas such as accounting, engineering, manufacturing, warehousing and logistics have not been left out of ICT innovations and development. The application of ICT to sales and marketing was a major breakthrough in the enterprise information systems (Bandra and Davis, 1996). In Nigeria, Aderemi and Oyejisi (2012) reported on the rapidly growing ICT industry to support the industrial sector. This consists of players involved in hardware and peripheral assembly and manufacturers, solutions providers, educational and training services, software development, marketing and information systems to manage and predict performance in firms amongst others.

In this age of knowledge economy, information is a valuable resource, which enables a business to steer in the right direction to achieve its objectives, attain a competitive advantage and to be administratively more efficient. A pharmaceutical business executive need to be informed about marketing events so that he can make reasonable decisions based on facts rather than assumptions (Anderson and Edward, 1990). ICT create inter-relationship among businesses, expanding the scope of industries in which a company must compete to achieve competitive advantage. Information and communication technology allows pharmaceutical companies to coordinate their activities irrespective of geographic locations. Thus, ICT affects the ways companies operate (Porter and Miller, 1985). In this paper, focus is placed on contemporary product marketing in the pharmaceutical firms in southwest Nigeria and what this means for educational activities, information technology advances and policy directions for legislation in the sector. The paper proceeds with the imperative of product marketing in the industry and its impacts. An analysis of the various forms of marketing tools and mediums in the industry was also undertaken and finally an evaluation of the role of education.

#### **Literature Review**

##### **Imperative of Product Marketing using ICT in Pharmaceutical Industry**

One of the problems facing industries today is lack of effective Information and Communication Technology (ICT) facilities. A new train of economic and technological development in the world that creates a faster and more robust economic system is ICT. Countries in North America, Europe and South East Asia have already boarded this train. African countries have very little choice but to join this pivot of development. The world has changed and will continue to change dramatically in terms of the way we see, work, socialize, learn, shop, market and conduct business. This is due to the wide spread and increasing use of information and communication technology (ICT). Technology will engender a "power shift", giving rise to entirely new systems for wealth creation and distribution of power (Ward and Griffiths,

1998). Power bases depend on information flows around the globe without restriction (Anderson and Edward, 1990). Information and communication technology (ICT) has been described as a marketing tool (particularly for modern marketing techniques) which is critical for economic success (Ryan, 2011). Moreover, it is indispensable for companies aiming to expand or improve efficiency. For over a decade now, many companies and organization have embraced ICT.

The implementation of ICT in pharmaceutical industries in Southwest Nigeria has received significant impetus in marketing pharmaceutical products. The pharmaceutical companies are now multiplying online tools, such as e-mail, web conferencing and direct to consumer links (DTC) on their website (Gibson, 2014). Pharmaceutical companies are also employing information and communication technology (ICT) in their product marketing in order to keep a steady hold on market share and further both competitive and profitability advantage. However, expenditure on ICT is usually looked upon as an unproductive overhead cost. There is need to evaluate the impact of ICT on pharmaceutical product marketing in Southwest Nigeria.

Pharmaceutical sales executives need to be informed about events so that they can make reasonable decisions based on facts rather than assumptions. Many business organizations in Southwest Nigeria today concentrate on their main activities of manufacturing and/or selling. Expenditure on what may be called information system is minimal (Anderson, 1990).

Meanwhile, ICT perform optimization and control functions as well as more judgmental executive functions (Porter, 1985). The influence of ICT on product marketing is taking a central role globally. Hence, it is relevant to study the impact of ICT on pharmaceutical product marketing in Nigeria using Southwest states as a case study. Southwest Nigeria states were chosen because most of the information technology investment and advancement are concentrated more in these states. One of the aims of our study was to understand the effect of the application of ICT to marketing of pharmaceutical products considering that health is wealth aside the monetary gain that could accrue from making more sales.

### **The Pharmaceutical Industry and Product Marketing**

The pharmaceutical industry is that section of industry, which manufactures medicinal chemicals and prepares them for use in the prevention or treatment of disease (Microsoft Encarta, 2004). Some companies engaged in manufacturing chemicals in bulk (primary manufacture), but all of them prepare them for medicinal use by methods collectively known as secondary manufacture. These automated processes include the production of drugs in single dosage forms, such as tablets, capsules or sachet for oral administration, solutions for injection and pessaries and suppositories for insertion into the vagina and rectum respectively. Other products include liquids such as linctuses and syrups to be taken by mouth, inhalations, in metered-dose aerosol sprays, drops for the nose, ears or eyes and creams, ointment and lotions for application amongst others.

Pharmaceutical product marketing is the business of advertising or otherwise promoting the sale of pharmaceuticals or drugs (Horrobin, 2000). The marketing of medication has a long history. The sale of miracle cures, many with little real potency, has always been common. Marketing of legitimate non-prescription medications, such as pain relievers or allergy medicine, has also long been practiced. However mass marketing of prescription medications were rare until recently. It was long believed that since doctors made the selection of drugs, mass marketing was a waste of resources; specific ads targeting the medical profession were thought to be cheaper and just as effective (Horrobin, 2000; Calfee, 2002; Hoffman et al., 2010). This would involve ads in professional journals and visits by sales staff to doctor's offices and hospitals. An important part of these efforts was marketing to medical students and direct and indirect marketing to health care providers (Wilkes et al., 2000).

Physicians are perhaps the most important players in pharmaceutical sales (Hoffman et al., 2010). They write the prescriptions that determine which drugs will be used by the patients. Influencing the physician is the key to pharmaceutical sales. Historically, this was done by a large pharmaceutical sales force. A medium-sized pharmaceutical company might

have a sales force of 1000 representatives. The largest companies have tens of thousands of representatives around the world. Sales representatives call upon physicians regularly, providing information and free drug samples to the physicians. However, economic pressures on the industry are causing pharmaceutical companies to rethink the traditional sales process to physicians (Banks and Mainour, 1992; De Mortanges and Rietbrock, 1997).

Pharmaceutical companies have developed processes to influence the people who influence the physicians (English-Maher, 2003). There are several channels by which a physician may be influenced, including self-influence through research, peer influence, direct interactions with pharmaceutical companies, patients, and public or private insurance companies (De Mortanges and Rietbrock, 1997). Physicians discover pharmaceutical information by many means, either by individual research from desk references or online sources, or from peer influence or pharmaceutical company marketing journals. They also rely upon pharmaceutical-branded detailing sites, pharmaceutical sales and non-sales representatives, and scholarly literature. Scholarly literature can be in the form of medical journal article reprints, often delivered by sales representatives at their place of employment or at conference exhibitions (Banks and Mainour, 1992; De Mortanges and Rietbrock, 1997).

In product marketing, peer influences play a great role. In this regard, key opinion leaders (KOL), or "thought leaders" who are respected individuals whirl a lot of influence. Pharmaceutical companies generally engage key opinion leaders early in the drug development process to provide advocacy and key marketing feedback. Some pharmaceutical companies identify key opinion leaders through direct inquiry of physicians (primary research) (Calfee, 2002). Physicians also acquire information through informal contacts with their colleagues, including social events, professional affiliations, common hospital affiliations, and common medical school affiliations. Some pharmaceutical companies identify influential colleagues through commercially available prescription writing and patient level data (Lexchen and Mintzes, 2002). There is also the process of direct physician contact with

pharmaceutical sales representatives (Horrobin, 2000). For instance the global leaders (TGL, 2010) reported of the existence of approximately 100,000 pharmaceutical sales representatives in the United States pursuing some 830,000 pharmaceutical prescribers. A pharmaceutical representative will often try to see a given physician every few weeks. Representatives often have a call list of about 200 to 300 physicians with 120 targets that should be visited in 4-6 week cycles (Wordpress, 2011). Because of the large size of the pharmaceutical sales force, the organization, management, and measurement of effectiveness of the sales force are significant business challenges. Management tasks are usually broken down into the areas of physician targeting, sales force size and structure, sales force optimization, call planning, and sales forces effectiveness (IPHA, 1999).

In the technique of physician targeting, marketers attempt to identify the universe of physicians most likely to prescribe a given drug. Historically, this was done by measuring the number of total prescriptions (TRx) and new prescriptions (NRx) per week that each physician writes. This information is collected by commercial vendors. The physicians are then divided into ten groups based on their writing patterns though, higher deciles are more aggressively targeted (Maguire, 1999). Some pharmaceutical companies use additional information such as: profitability of a prescription (script), accessibility of the physician, tendency of the physician to use the pharmaceutical company's drugs, effect of managed care formularies on the ability of the physician to prescribe a drug. Other additional information include adoption sequence of the physician (that is, how readily the physician adopts new drugs in place of older, established treatments), and the tendency of the physician to use a wide palette of drugs, and the influence of the physicians on their colleagues (Komesaroff and Kerridge, 2002). Data for drugs prescribed in a hospital are not usually available at the physician level. Advanced analytic techniques are used to value physicians in a hospital setting (Maguire, 1999, Lexchen and Mintzes, 2002).

Marketers must decide on the appropriate size of a sales force needed to sell a particular portfolio of drugs to the target audience; design the optimal reach (how many physicians to see)

and frequency (how often to see them) for each individual physician; and decide how many sales representatives to devote to office and group practice and how many to devote to hospitals mail list or contacts (Hoffman et al., 2010).

However, public and private insurers influence the writing of prescriptions by physicians in developed countries through formalities that restrict the number and types of drugs that the insurer will cover. Not only can the insurer influence the sales of drugs by including or excluding a particular drug from their documentary, they can also influence sales by placing bureaucratic hurdles to prescribing certain drugs (Aitken and Holt, 2000).

Since the late 1970s, direct-to-patient marketing of prescription drugs has become important. Many patients will inquire about, or even demand to receive, a medication they have seen advertised on television. In the United States, there has been an increase in mass media advertisements for pharmaceuticals (Maguire, 1999; Aitken and HoIt, 2000; Lexchen and Mintzes, 2002). Expenditures on direct-to-consumer (DTC) pharmaceutical advertising have more than quintupled in the last seven years since the FDA changed the guidelines, from \$700 million in 1997 to more than \$4 billion in 2003 (TGL, 2010).

In the United States, marketing and distribution of pharmaceuticals is regulated by the Federal Prescription Drug Marketing Act of 1987 (TGL 2010). In Nigeria, marketing and distribution of drugs is regulated by the National Agency for Food and Drug Administration and Control (NAFDAC) (Afolabi and Erhun, 2003). The mass marketing to consumers of pharmaceuticals is controversial. It is banned in every western country except the US and New Zealand, which was considering a ban (Moynihan and Cassels, 2005). This practice is very common in developing countries including Nigeria. Some feel it is better to leave the decision wholly in the hands of medical professionals, others feel that consumer education and participation in health is useful, but consumers need independent, comparative information about drugs. For these reasons, most countries impose limits on pharmaceutical mass marketing that are not placed on the marketing of other products. In some areas it is required that ads for drugs include a list of possible side

effects, so that consumers are informed of both facets of a medicine (Maguire, 1999; Aitken and Holt, 2000; Lexchen and Mintzes, 2002). Canada's limitations on pharmaceutical advertising ensure that commercials that mention the name of a product cannot in any way describe what it does. Commercials that mention a medical problem cannot also mention the name of the product for sale, at most, they can direct the viewer to a website or telephone number operated by the pharmaceutical company (Maguire, 1999).

## **RESEARCH METHOD**

The study area was Southwest Nigeria, which is comprised of Oyo, Osun, Ogun, Ondo, Ekiti and Lagos States. This study area was chosen because about 95% of the pharmaceutical companies that were into manufacturing of drugs in Nigeria were located there (Pharmanews, 2008). It was therefore assumed that results obtained from the six states would largely represent a fair view of what obtains in the entire country with regards to pharmaceutical companies and manufacturing of western drugs.

The Managing Directors or Chief Executives and Marketing personnel who were engaged in the marketing of Pharmaceutical Product in registered pharmaceutical Manufacturing Companies (76) in southwest Nigeria, constituted the study population. This selection was based on the assumption that the managers in these functional areas were those who should have relevant information on how effectively they had utilized ICT to improve their product marketing via feedback. The information was obtained from the Pharmacists Council of Nigeria (PCN) gazette. PCN is the official body that oversees the registration and activities of all pharmaceutical manufacturing companies in the country. All the firms (76) were sampled. In pharmacy practice in Nigeria and as obtainable around the world, pharmaceutical companies are usually grouped into four categories namely, retail pharmacy, wholesale and retail pharmacy, wholesale pharmacy, and manufacturing pharmaceutical companies that also engages in drug importation or contract manufacturing. Those that engage in assembling of capsules can also be grouped under manufacturing. The volume of marketing activity varies across the groups.

The research instruments employed in the study were questionnaire, interview schedules and secondary data collection. The questionnaire was divided into two sections. The first section had questions on biographical data of the respondents. It was also designed to collect information on the pharmaceutical company's profile and identify type of ICT used. The second part contained structured questions on variables related to ways of evaluating the impact of ICT identified above on Pharmaceutical product marketing output such as effect on profit and competitiveness among others. Effects on profit and competitiveness were evaluated in terms of companies' business trends, turnover, and market share. The questionnaires were validated by ensuring that all the questions asked were relevant to the research objectives. They were simple and unambiguous. They were pretested on eight pharmaceutical companies in Southwest Nigeria and the responses obtained were used to improve the quality of the questionnaires. These respondents were not included in the final study.

Oral interviews were conducted with few top executives officers in most of the Pharmaceutical companies selected to restate some vital questions that were not hitherto adequately addressed in the questionnaire. About five (5) trained field officers and the researchers were engaged, an average of one per thirteen pharmaceutical manufacturing companies to assist in the administration and collection of the questionnaires. They also served as liaison and collation officers in case of any problem for the period of one month while the exercise lasted. Preliminary investigation and experience had shown that field officers were given better attention usually between 12:30pm and 2:30pm when marketing floor operation is closed, staffs were on break and activities in the companies are a bit relaxed. The major sources of secondary data were Pharmacists' Council of Nigeria (PCN) annual report, journals, newspapers, textbooks and Pharma news.

All the variables considered were related to the study and they were measured accordingly. For instance educational background of respondents was classified into doctoral degree (PhD), masters' or second degree (M.SC/M.A/M.B.A), bachelor or first degree (B.Sc/BA/HND), national diploma (OND/NCE),

and ordinary or o'levels certificate (SSCE, WASC etc). Other product marketing issues rather attitudinal in nature such as consideration for cost implications against the adoption of ICTs, effect on profits and competitiveness among other things were measured in terms of companies' perception of business trend, marketing output in terms of market share and turnover. The degree of adoption of ICT and effect on organization decision were measured on a 5-point ordinal scale as 'highly responsible' (5) 'responsible' (4) 'fairly responsible' (3) 'hardly responsible' (2) and 'not responsible' (1). However, while business trend was rated on a 5-point likert scale of (5) predictable, (4) less predictable, (3) unpredictable, (2)static and (1) declined; key performance indicators such as product marketing output before and after adoption of ICT was measured on a 5-point ordinal scale of (5) more profitable, (4) profitable (3) unprofitable (2) static and (1) declined.

#### **Data Processing and Method of Analysis**

The collected data was edited, coded and the variables were given sequential numbers for ease of computer identification and input into the Statistical Package for Social Scientists (SPSS).

Descriptive statistics such as frequency distributions mean and percentages were used to analyze the collected data. Duncan Multiple Range Test was conducted to determine difference of means. The t-test tests and bar chart were used to compare business trend and product marketing output market share and companies turnover before the adoption and after the adoption of ICT in the companies to capture the objectives of the study.

#### **RESULTS AND DISCUSSION**

A total of 76 pharmaceutical companies were sampled in southwest Nigeria with 68 (89.5%) response rate. The result, interpretation and implications of the findings ensue.

#### **Socio-economic Characteristics of the Respondents**

The socio-economic characteristics of the respondents from the registered pharmaceutical companies in southwest Nigeria are as shown in table 1.

Table 1: Socio-economic characteristics of the respondents

Description	Frequency	Percentage (%)	
<b>Gender</b>	Male	40	58.8
	Female	28	41.2
<b>Age</b>	20-29	12	17.9
	30-39	17	41.8
	40-49	28	25.4
	50 and above	10	14.9
<b>Educational Qualification</b>	WASC/O'Levels	1	1.5
	OND/NCE	10	14.7
	HND/BSC/BA	40	58.8
	PHD	4	5.8

The gender characteristics of respondents' shows that 58.8% were male and 41.2% were female. Age distribution of the respondents was 20-29 years (17.9%), 30-39years (41.8%), 40-49years (25.4%) and 50 years and above (14.9%). This implies that majority of the workers in these pharmaceutical companies (25.4%) were still in their active age. Furthermore, eleven respondents (16.2%) had qualification less than a first degree such as West African School Certificate, Ordinary National Diploma, and National Certificate of Education. Forty respondents (58.8%) had first degree and Higher National Diploma while seventeen (25%) had academic higher than first degree. The levels of academic qualification show the quality of respondents reached in the course of this study. Other socio-economic variables of the respondent reveal that 40 (58.8%) of the respondents had less than 5years of experience with their companies, 20 (29.4%) had 5-9years, 7(10.3%) had 10-14years, and 1 (1.5%) had 20-24years. Furthermore, the respondents were from various functional areas in the pharmaceutical manufacturing companies as follows: Five (7.4%) each were customer service and medical representatives; two (3.0%) were Directors/CEOs; seventeen (25%) occupied the position of e-marketing manager; six (8.9%) were sales manager; and twenty-one (30.9%) were sales representatives amongst others. This continuum of personnel shows that the respondents have a vivid understanding of their marketing structure and better understanding of

their products in order to provide the required information for this research work.

#### Analysis of ICT Marketing Tools, Mediums and level of adoption in the Industry

A significant number of ICT marketing tools were deployed in the pharmaceutical companies. These ICT marketing tools and their mean rate of adoption are given on table 2. ICT marketing tools and mean values of adoption such as video conferencing (2.35), computerized credit ratings (2.27), automated re — ordering and creating of values for customers (2.11), electronic funds transfer (2.01), electronic home and office marketing (1.91), electronic spread sheet (1.87), point of sales system (1.82), electronic data interchange (1.78) and target and order (1.03) were significantly lower and partly or not adopted. The major marketing activities performed using ICT in the companies were volume forecasting, segmentation analysis and communication. Forecasting of volume was achieved using the electronic spread sheet. An in-house produced decision support system took care of the segmentation analysis while communicating was done with computer-based graphics aids, telephone, and e-mail. The electronic spread sheet was used to plot trends from historical sales performance. This trend was always used to forecast the next three, six and 12 months sales. Electronic home and office marketing (EHOM) were used to communicate between the customers and the company information on the product attributes to limited

audiences. Local Area Network and Wide Area Network was deployed to communicate with a larger audience. The telephone was used to communicate with restricted audience of customers as justified by Ilori et al. (1999). Those firms that partially adopted ICT were involved in using ICT tools such as electronic spreadsheet, in-house decision support system, forecasting and segmentation analysis with manual tools such as the use of pen, paper and a simple calculator. These categories of firms required further education and training.

**Impact of the Identified Information and Communication Technologies (ICTs) on Pharmaceutical Product Outputs**

Table 3 shows specific impacts of the identified ICTs in the pharmaceutical companies operations and services. There were significant

differences (F16.10, P<0.05) accruing to the organizations from the deployment of ICTs for marketing. For instance, using a mean rating of 0 (zero impact) to 5 (maximum), ICT was responsible for faster marketing services (4.25), improved customer marketing services (4.21), for competitive strength/advantage (4.10), modernization of operations (3.41) and for providing home and office marketing (3.15). Although, the proportion of responses for modernization and facilitation of home and office marketing were fairly positive but they were not as affirmative as the earlier mentioned. On a general note, experts in the field of technology and marketing agreed that when properly used, ICT tools assist in the realization of effectiveness in the market in addition to shaping workforce opportunities (Vilasela-Requena et al., 2007).

**Table 2: Extent of adoption of identified ICT products by the pharmaceutical companies in southwestern Nigeria**

ICT Tools	Scale			Mean Rank
	3(%)	2(%)	1(%)	
Telephone Marketing (TM)	79.4	11.8	8.82	2.77a
Local Area Network (LAN)	79.3	17.7	2.94	2.74a
Wide Area Network (WAN)	79.1	26.5	4.41	2.68a
Programs for Daily Calculating of Accounting Balance (DCAB)	69.0	8.07	12.9	2.57a
Computing Personal Computer Memory Card Interface (PCMCIA)	56.5	27.4	16.1	2.38b
Decision Support System (DSS)	53.6	28.6	17.9	2.35b
Video Conferencing (VC)	45.1	31.4	23.53	2.29b
Computerized Credit Ratings (CCR)	50.0	17.7	25.0	2.27b
Automated Re-ordering and Creating of Values for Customers (ARCVC)	39.7	3.49	29.4	2.11b
Electronic Funds Transfer (EFT)	38.1	28.6	33.3	2.01b
Electronic Home and Office Marketing (EHOM)	40.0	11.1	48.9	1.91c
Electronic Spread sheet (ESS)	56.1	29.6	16.7	1.87c
Point of Sales System (PSS)	52.6	24.6	24.6	1.82c
Electronic Data Interchange (EDI)	31.6	22.2	44.4	1.78c
Others: Target and Order	0.00	6.00	4.0	1.03d

Mean Ranks: a=2.50-3.00; b=2.00-2.49; c=1.50-1.99; d=1.00-1.49; e=0.50-0.99 & f=0.00-0.49

Means of the same letter are significant at 5% level of significance

Scale of agreement: 3=fully adopted; 2 = partly adopted; 1 = not adopted



**Table 3: Degree to which identified ICT products were responsible for pharmaceutical companies' product marketing output in southwestern Nigeria**

Variables	Scale					Mean Rank
	1	2	3	4	5	
Faster Marketing Services	1.47	4.41	16.71	33.82	47.06	4.25
Improved Customer Marketing Services	0.00	2.94	19.12	20.59	57.35	4.21
Competitive Strength/Advantage	1.47	4.41	14.71	23.53	55.88	4.10
Modernization	4.41	16.18	17.65	20.59	33.82	3.41
Facilitated Home and Office Marketing	27.94	8.82	14.71	23.53	25.0	3.15

Scale of agreement: 5=highly responsible; 4=responsible; 3=fairly responsible; 2=hardly responsible; 1 = not responsible. Mean ranks were significant at 5% level of significance.

**Table 4: Percentage distribution of pharmaceutical companies' business trend before and after ict adoption in southwestern Nigeria**

Business Trend	Before ICT		After ICT	
	Frequency	Percentage	Frequency	Percentage
Declined	-	-	-	1.5
Static	7	10.3	-	-
Unpredictable	8	11.8	1	-
Less profitable	38	55.9	5	7.4
Profitable	15	22.1	62	91.1
Total	68	100.0	68	100.0

**Adoption of ICT for Product Marketing and its Impact on Business Trend of the Pharmaceutical Companies in Southwestern Nigeria**

In table 4 responses to the question on business trend before and after the application of ICT in the pharmaceutical companies were collated. While 14 (21%) of respondents opined that business trend before the use of ICT was less profitable, 60 (88%) opined that it was profitable after the use of ICT. This responses generated a statistically positive significant value (table 4) between the means of pharmaceutical business trend before and after the adoption of ICT at confidence level of 95% ( $t=5.940$ ,  $\rho<0.05$ ). This implies that after the use of ICT, the companies' business trend became more profitable due to ability to predict changes and keep tract of developments in the industry.

Huber (1990) gave a similar report that the use of information and communication technology led to more rapid and more accurate identification of problems and opportunities. The Duncan Multiple Range test analysis and T-test analysis conducted (table 4) attests to the strength of the impact of ICT application on the companies' business trend.

**Evaluation of the Role of Education in ICT Application in the Industry**

The educational level of the respondents earlier computed in Table 1 reveal that 57 (83.8%) of the respondents had 1<sup>st</sup> degree and above. Furthermore, the ICT literacy level index of management staff in the pharmaceutical firms was computed and tabulated (see tables 5 and 6). Finding reveals a very good literacy level with

the marketing managers having the most impressive literacy index. Furthermore, the frequency of training, effectiveness in ICT adoption for marketing and level of ICT literacy was strongly and positively correlated at 0.01 level of significance with a correlation coefficient of  $r = 0.75$ . This implies that the more frequent training is embarked upon, the higher the literacy level and higher output in the deployment of ICT for marketing. While most studies (AbdulRahman, 2011; Mbuyazi, 2012; Fadun, 2013; Yusuf, 2013) have found significant positive relationship between ICT adoption, ICT literacy and performance, our research reveal strong positive correlation between graduate education, training and the ability to make e-marketing decisions, create business value and achieve effectiveness in service delivery. Low level of training and education will obviously result in low literacy level and ineffectiveness in e-marketing decision making.

Thirty-six companies responded to the existence or otherwise of a development plan to expose non-ICT managers to ICT tutoring. Some (52.4%) of the companies have plan for training non-ICT managers to be proficient in the use of ICT. Also, 66.2% of the companies that provided ICT training to staff also offer motivation for staff to obtain additional training and education in ICT. It may be considered that ICT proficiency is crucial to the future competitiveness of these companies.

The level of education, quality of marketers and managers employed and level of training provided by the companies were adequate to

support the level of performance expected from managers. Managers who may wish to leverage their own desired performance may opt for additional training that is translational into desired performance, which in any case is paramount for product promotion and competitiveness. This is because majority (71.5%) of the respondents believed that there would be more ICT gadgets in the industry in the future. Most (72.8%) of the respondents believed that the future of ICT is promising especially towards enhancing marketing in the industry. For solutions to better ICT compliance, the perceptions of the respondents varied. However, having customized education, training and experience in ICT for product marketing was perceived as the most appropriate solution to better the future of ICT compliance and competence in the industry. For instance, the respondents, (62.8%) opined that having thorough knowledge of ICT marketing type was more appropriate, (37.6%) agreed that company must have enough experience of ICT for marketing of their product i.e. there is need for ICT training for the staff, especially their marketing department. The call for ICT experts was reiterated on top management staff as about half (52.7%) corroborated that the top management staff needed to be knowledgeable sufficiently in order to equip the companies with the right ICT facility to help in both marketing and decision making.

Thus, from the foregoing, the major role of education and training in the companies was to facilitate marketing activities for improved performance using ICT.

**Table 5: Impact of ICT on pharmaceutical companies' business trend in southwestern Nigeria**

Parameters	Mean	N	Std. Deviation	t	df	p
Business trend before adopting ICT	2.93	68	1.041			
Business trend after adopting ICT	4.75	68	0.904	5.930	67	0.000

Scale of agreement: 5= profitable; 4 =less profitable; 3=unpredictable; 2=static, 1 =declining  
Means of the letter along the same column are significantly different at 5% level of significance.

Table 6: ICT literacy level of pharmaceutical companies' management staff in southwestern Nigeria

Cadre	Index	Approximate Frequency
Executive Management	2.36	Often
Marketing Managers	3.38	Often
Marketing Officers	2.35	Often
Management Staff	2.20	Often

Scale of agreement: 3= very often; 2 = often; 1.5 = irregular; 0.5 = rarely; 0.0 = never  
Source: Field Survey

### Policy Implications

For ICT to be effective in marketing, intending users of ICT systems must have acquired experience on how to use the specific ICT in question. This is because many of the information systems are very sophisticated such that only a good command of them can ensure a useful exploitation of their numerous features as corroborated by (Ilori et al., 1999; Oshunloye, 2009). Some policy implications from this study include:

(i) Pharmaceutical industries should frequently review the ICT facilities in use in their companies and avail themselves of the modern ICT facilities. These are to be utilized more for services such as e-marketing, prediction of market trends and daily marketing operations including EHOM.

(ii) For effective ICT use in pharmaceutical product marketing, there should be proper planning as regards what is required from the ICT systems before acquisition. In addition, adequate education and training should be organized. This way, useful man hours and funds would not be wasted but rather harnessed for corporate and individual success. A determination of the product effect and the future effects is necessary before acquiring a specific ICT.

(iii) Future plans of pharmaceutical industry should include aggressive marketing strategy, using ICT to drive more sales of new products and business development. This will ensure optimum utilization on the ICT system.

(iv) The organizations' ICT marketing strategy should involve all employees of the companies. Of more importance are the involvement, acceptance, and support of the marketing concept philosophy by the company's

top management. Top management as well as marketing managers need adequate skill in ICT for them to contribute meaningfully to the application of ICT for product marketing in the industry.

### CONCLUSION

Information and Communication Technologies adoption in pharmaceutical product marketing is essential for the enhancement of both the efficiency and effectiveness of the decision-making process. As observed in our research, most operations in the pharmaceuticals companies have been taken over and handled more efficiently by application of software packages. Adoption of ICT has continued to change the product structure, content and quality of product marketing operations. This is supported by Huber (1990) who stated that the use of computer-assisted information processes and communication technologies leads to more rapid and accurate identification of problems and opportunities. Huber (1990) and Buhalis and O'Connor (2005) also supported this assertion by proposing that the use of ICT for decision making will lead to greater levels of comprehensiveness and organizational intelligence that is accurate, timely and available.

The study established that the use of ICT in pharmaceutical product marketing had impact on market shares through enhanced operations and services, business trend and turnover of the companies investigated. In addition, information on the types of Information and Communication Technology devices relevant to the pharmaceutical industries; especially for their marketing operations have been articulated in this paper (table 1).

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