

**EFFECT OF ICT INVESTMENT AND USE ON BUSINESS PERFORMANCE OF
UNIVERSITIES IN SOUTH WEST NIGERIA**

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ABSTRACT

The study assessed the influence of ICT Investment and Use on Performance of Business Units of Universities in South West Nigeria. To do this, the entire population of Universities in South Western Nigeria comprising of seven Federal, ten state and twenty private Universities were sampled for the study. Both primary and secondary data were employed for the study. One hundred and fifty two questionnaires were administered out of which one hundred and forty two were returned representing 93% response rate. The secondary data were derived from the annual reports of each of the Universities covered by the study. The variables of interest from the secondary data were: ICT Investment (ICT Inv.), Return on Capital employed (ROCE), Net Profit Margin (NPM), and ICT Cost Efficiency (ICTCE). Multiple Regression analysis employing the use of ANOVA revealed a very highly significant relationship $F(4, 137) = 120.029$; $P < 0.05$ (table value = 5.66) between the independent variables group (ICT Investment, Effect of ICT use on Personnel,) and Performance of business units of Universities in South-western Nigeria. Furthermore, competent hands engaged should be trained and retrained for effective use of the facility to exploit to the optimum the benefits of ICT.

Key Words: ICT, Adoption, Performance, ICT Investment

1. INTRODUCTION

It is now widely accepted in contemporary literature that ICT has had important and positive implications for both productivity and output growth (Basant, Commander, Harrison & Menezes-Filho, 2006). However, most of that literature is concerned with the developed

economies. The extent of adoption and the consequences for firm and economy-wide performance in developing countries remains largely *terra incognita*. In the context of the developed countries, there is now a wide consensus in the literature that ICT can deliver significant and persistent improvements in performance for technology adopters. Capital investment on Information and Communications Technology (ICT) projects in both the private as well as the public sector of Nigeria economy has been on the increase in the last ten years. All over the world, the ways of doing business has continued to change in the last two decades and what is happening in Nigeria is not an exception.

In developed countries, ICTs are generally believed to have a dramatic influence and are however conceptualised to continually determine the competitive nature of virtually all businesses. Conversely, in the context of developing countries, Ojo (1994) submitted that ICTs have brought a technological revolution whose utilization and production has been somewhat limited but whose potentials for diffusion holds a great promise in accelerating the socio economic development of these countries. However, advances in ICTs were pivotal to the recent social and economic transformation in both the developed and developing countries. Its tremendous effect is obvious in both the educational as well as non-educational organizations. The focus of this study however is more on the effect of ICT investment and use on the performance of business units of Universities in South-western Nigeria.

In Nigeria, development of ICTs is becoming more and more important in both the services such as Banks, Insurance companies, Educational Institutions etc. Prior to the seventies, ICTs are relatively unknown as virtually every sector of the economy is manually operated. However, as time went by ICTs began to gain gradual acceptance and now ICTs has entered virtually almost every sector of the economy though this is in varying degrees. The objectives of this study are as follows:

- (i) determine the influence of ICT adoption on personnel of the business units of Universities in South West Nigeria.
- (ii) assess the influence of ICT investment on performance of business units of Universities in South West Nigeria.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Information and Communication Technology has permeated virtually every area of business activities of both developing and developed countries (Akomea-Bonsu & Sampong, 2012). This is evident in the ongoing diffusion of ICT and e-business technologies and services among firms which is a striking example of the possible dynamics of technological change and economic development. Economic theory (Breshnahan & Trajtenberg, 2002, Helpman, 1999) suggests that the adoption and diffusion of new technologies can be spurred by many factors and can have far reaching consequences. Virtually all economic spheres can be affected by technologically induced changes, including innovation dynamics, productivity and growth, the development of market structures, and the composition of labor demand.

While it is generally accepted that ICT affects firms' performance and characteristics as well as the environment in which firms operate, different firms in different sectors exhibit varying payoffs despite similar investments in ICT. Therefore, one of the areas this work tried to address is to find out why firms adopt ICT, what they do with it and how this affects their

performance. ICT impacts on a firm's performance by triggering innovative processes, which in turn depend on the firm's internal and external characteristics. The starting point of this analysis is the premise that ICT is an enabler of innovation. In other words, the adoption and use of ICT per se does not automatically induce innovations. However, ICT can contribute indirectly to firm performance by enabling them to improve labor productivity, rethink processes and develop new products. Developments in the services of manufacturing firms should not be considered merely on the basis of increase in the number of their branches and firms generally. In addition, developments within the theme of this work relates in addition to procedures, processes, and methods of doing things to ensure greater efficiency cum productivity and profitability alike. Therefore, the resulting efficiency from development must be demonstrated by cost minimisation, increased profitability for the intermediaries, better service delivery for customer satisfaction and improved support for sustainable economic growth and development, for stakeholders' benefits (Anao, et. al. 1993) and for which reason firms inclusive of business units of Nigerian Universities deploy ICT to aid their operations. ICT is now deployed by countries to drive economic growth. Since the advent of ICT in the world, incredible advancement has been recorded and is still being recorded on a daily basis. We have digital technologies like fibre optic networks, instant messaging, cellular phones, new data networks, automated recording, 2.5G technology, and 3G technology to mention a few (Kwong, 2004). The fact that technology can be used to champion local economic development, health, education, social justice, human development, and reduction of poverty is no longer in doubt.

ICT is very widespread in businesses of all sizes. Small businesses are however slower than large ones in ICT adoption compared to large businesses. Adoption and use of ICT is driven by the benefits it offers. ICT improves information and knowledge management in the firm. It has capacity also to reduce transaction costs, increase the speed and reliability of transactions for both business to business as well as business to customer transactions. Other benefits include faster communication and more efficient resources management. ICT applications such as Knowledge Management Services (KMS), Enterprises Resource Planning (ERP), etc. allow firms to store, share, and use their acquired knowledge and know-how. It reduces inefficiencies resulting from lack of coordination between firms in the value chain. Despite the potential benefits of ICT, there is a debate about whether ICT adoption improves performance. It is noteworthy that use of and investment in ICT requires complementary investment in skills. While many studies provide evidence of the positive effects of ICT adoption on firm performance, others have shown no relation between computer use and performance of a firm. Studies showed that the use of ICT can contribute to improve firm performance in terms of increased market share, expanded product range, customised products and better response to client demand. Moreover, it indicates that ICT may help reduce inefficiency in the use of capital and labour by reducing inventories and that the more customers or firms are connected to the network, the greater the benefits. Analysis however showed that complementary investments in skills, organizational change and innovation are keys to making ICT work. Also, the use of ICT affects firms' performance. Primarily, when accompanied by other changes and investments without which economic impact of ICT may be limited. Some firms do not make active use of ICT due to the following factors:

- i. Lack of applicability to the business.
- ii. Preference to established business models.
- iii. Cost factors.

- iv. Lack of qualified personnel with ICT skills.
- v. Insufficient customers' access.

ICT application is still in the early stage in most developing countries where its utilization is grossly influenced by internal and external factors. Most companies follow four strategies in their bid to attain competitive advantage. These are: Cost, Speed, Quality and flexibility strategies. There is a positive relationship between ICT application and competitive advantage. ICT is a key growth area in this century of dynamic and turbulent business environment as it enables competitiveness through utilization of advanced ICT to improve efficiency and cost effectiveness. Most researchers referred to ICT as a term that contains basically software, hardware, networks and people (Li-Hua& Khalil, 2006; Li-Hua, 2004; Hwang, 2003; UNDP Evaluation office No. 5, 2001) others such as Carr, 2003; identified ICT as a process which includes sequences of phases to treat and transform data into information which is useful for decision makers. The term ICT has expanded to include the role of ICT tools not just inside the company but also outside the company as well (UNDP, 2001). ICT is considered as a tool of marketing and contacting customers and looking for possible customers, as well as presenting ICT services. ICT is considered as a key enabler for globalization facilitating information flow, capital, ideas, people and products. ICT utilization influence an organization and all of its elements such as people, culture, structure, process and tasks (Leavitt & Pindy, 1964). Major roles of ICT are: Administrative, Operational, and Competitive (FuHo, 1996). Marchland et al. (2004) recommended four dimensions for describing ICT practices, these are: Operational support, business process support, management support, and innovation support. Rogers (1983) suggested that ICT application influence the nature of organizational structure, processes, procedures, internal and external communication process and organization size. Literature showed that ICT diffused rapidly in developed industrialized countries but relatively slowly in developing countries thus leading to the ICT gap or digital divide between developed and developing countries. This is due to insufficient ICT infrastructure, governmental policies, small size of companies, and lack of ICT/ERP experience and low level of ICT maturity. These affect adoption decision (Huang & Pavia, 2001).

H₀₁: There is no significant influence of ICT adoption on personnel of the business units of Universities in South West Nigeria.

H₀₂: There is no significant influence of ICT investment on performance of business units of Universities in South West Nigeria.

The research questions addressed by this study are:

1. What influence has ICT adoption on the personnel of business units of Universities in South West Nigeria?
2. To what extent has ICT investment influenced performance of business units of Universities in South West Nigeria?

3. METHODOLOGY

The exploratory research design was adopted for this study. Both primary and secondary data were employed for the study. The population of the study covers all the thirty seven Universities accredited by the Nigerian Universities Commission. These comprise of seven Federal, ten State and twenty private Universities located in the South West zone of the country. A total of one

hundred and fifty two structured questionnaires were administered to the concerned officers of the Universities namely: Bursar, Deputy Bursar, Managers, Accountants and Administrative Officers. One hundred and forty two were completed and returned giving a response rate of approximately 93%. All items were subjected to reliability test, the resulting Cronbach’s alpha value ranges from 0.70 to 0.88 which is reliable enough for an applied research of this nature (Nunnally, 1978). Likert-type scale was used for each item (1 = Strongly Disagree, 2 = Disagree, 3 = Partially Disagree, 4 = Partially Agree, 5 = Agree and 6 = Strongly Agree. The responses were analyzed through difference of mean, analysis of variance (ANOVA), Pearson’s moment correlation coefficient, Partial correlation simple linear regression and factor analysis. Secondary were collected from the available Annual Reports and Accounts of the Universities covered by the study. Information of concern to the study from the secondary data are as follows: Net Profit Margin (NPM), Return on Capital Employed (ROCE), ICT Investment (ICT Inv.) and ICT Cost Efficiency (ICTCE).

4. RESULTS

Descriptive Statistics:

Table 4.1 Percentage Distribution of Respondents by Status

		Respondent			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Administrative Officer	6	4.2	4.2	4.2
	Accountant	32	22.5	22.5	26.8
	Principal Accountant	70	49.3	49.3	76.1
	Deputy Bursar	29	20.4	20.4	96.5
	Bursar	5	3.5	3.5	100.0
	Total	142	100.0	100.0	

Source: Field survey, 2011

Table 4.2 Percentage Distribution of Respondents by Institution

		Type			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private Universities	44	31.0	31.0	31.0
	State Universities	36	25.4	25.4	56.3
	Federal Universities	62	43.7	43.7	100.0
	Total	142	100.0	100.0	

Source: Field Survey, 2011.

Table 4.3 Analysis of Effect of ICT adoption and diffusion on Personnel

Alter Skills for Employment

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Hardly Agree	11	7.7	7.7	7.7
Agree	66	46.5	46.5	54.2
Strongly Agree	64	45.1	45.1	99.3
45.00	1	.7	.7	100.0
Total	142	100.0	100.0	

INFERENTIAL STATISTICS

Table 4.4 Coefficients of Regression of the Predictors and Dependent Variables

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	44.878	10.362		4.331	.000
	Benefits	.867	.117	.529	7.430	.000
	Solutions	1.004	.288	.158	3.489	.001
	Investment	.124	.132	.070	.940	.349
	Effects	1.151	.073	.637	15.784	.000

a. Dependent Variable: Sum

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Benefits	Between Groups	7867.799	29	271.303	7.258	.000
	Within Groups	4186.793	112	37.382		
	Total	12054.592	141			
Solutions	Between Groups	628.104	29	21.659	14.198	.000
	Within Groups	170.853	112	1.525		
	Total	798.958	141			
Investment	Between Groups	6812.089	29	234.900	7.216	.000
	Within Groups	3646.108	112	32.555		
	Total	10458.197	141			
Effects	Between Groups	7335.579	29	252.951	10.869	.000
	Within Groups	2606.619	112	23.273		
	Total	9942.197	141			

4.5 SUMMARY OF REGRESSION COEFFICIENTS OF NET PROFIT MARGIN OF THE UNIVERSITIES STUDIED

UNIVERSITIES	R ²	F	α_1	α_2	t ₁	t ₂

FEDERAL	.759	11.031	1.19E-007	-.008	.92	-3.526
STATE	.574	4.724	.000	-14.429	.292	-1.129
PRIVATE	.934	49.699	-8.4E-010	.552	-.087	2.388

Table 4.6 SUMMARY OF REGRESSION COEFFICIENTS OF RETURN ON CAPITAL EMPLOYED (ROCE) OF THE UNIVERSITIES STUDIED

UNIVERSITIES	R ²	F	α_1	α_2	t ₁	t ₂
FEDERAL	.238	1.096	1.50E-008	1.81E-005	1.322	.087
STATE	.502	3.534	-2.8E006	-.060	-1.123	-2.094
PRIVATE	.995	668.873	1.58E-008	.38	4.232	4.271

Table 4.7 SUMMARY OF ANALYSIS OF VARIANCE (ANOVA) AND COEFFICIENTS OF ICT Cost Efficiency (ICTCE) OF THE UNIVERSITIES STUDIED

UNIVERSITIES	R ²	F	α_1	α_2	t ₁	t ₂
FEDERAL	.251	2.68	-2.7E005		-1.637	
STATE	.794	30.815	-7.6E-005		-5.551	
PRIVATE	.947	141.841	4.06E-008		11.910	

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25211.243	4	6302.811	120.029	.000 ^a
	Residual	7193.976	137	52.511		
	Total	32405.218	141			

a. Predictors: (Constant), Effects, Investment, Solutions, Benefits

b. Dependent Variable: Sum

3. DISCUSSION

Table 4.1 revealed the distribution of respondents in which case the highest (49.3%) are the Principal Accountants being the officers who take direct responsibility for supervision of the business Units of the Universities.

Table 4.2 showed the % respondents by category of University with the Federal being the highest (43.7%) considering the staff strength of the various categories of Universities covered by the study.

From table 4.3, it could be seen that ICT adoption has such effects as: fear of retrenchment (88%), Alter skills for employment (92%), reduce workforce (83%). Thus H_{01} is rejected. This finding is consistent with the findings of (Breshnahan&Trajtenberg, 2002, Helpman, 1999) which suggests that the adoption and diffusion of new technologies can be spurred by many factors and can have far reaching consequences including composition of labour demand. Furthermore, the t-value of 15.784 and $P < 0.000$ is indicative of the fact that ICT adoption has a significant effect on personnel hence, H_{01} is thus rejected. This finding is corroborated by the position that the impact of ICT is not singularly responsible for improved performance but rather the actions of individuals and groups within an organization because people can, and do react to and shape systems in different ways (Kimble & McLoughlin, 1995).

From tables 4.4 – 4.7

The $F = 7.216$ and $P < 0.000$ is indicative of the fact that ICT investment is significant in the business units of the Universities covered by the study. Furthermore, multiple classification ANOVA result of $F = 120$ and $P < 0.000$ further confirmed that ICT investment has positive relationship with increased performance. This result is consistent with the integrated business and information solutions (IBIS) concept which maintained that business growth can best be achieved through optimal utilization of the potential of both human and technological resources of an organization (Ojukwu, 2006). She found that that as levels of investments on IBIS increases, growth levels are also increasing. The two variables (investments and growth correlates with a coefficient of 0.978.

POLICY IMPLICATION, CONCLUSION AND RECOMMENDATION

This study has shown that ICT investment has a significant and positive relationship with increased performance of the business units of Universities in South West Nigeria. The study also revealed that ICT adoption has a significant effect on personnel of the business units of the Universities studied. The study therefore recommends that Universities in South West Nigeria are enjoined to increase their quantum of ICT investment considering the fact that growth increases with ICT investment. This is considering the fact that ICT investment correlates positively with firm growth (Ojukwu, 2006).

This study has focused on the positive side of ICT. It does not mean that ICT has no negative sides after all. Further research could focus on the negative sides of ICT adoption to serve as a caveat for ICT users.

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