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Impact of Information and Communication Technology Investment on the on Productivity of Selected Sachet Water Companies in Oyo State

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Abstract: The high level of Information and Communication Technology (ICT) investment in business enterprise makes it imperative to investigate the effects of management practice on ICT usage and effect of ICT investment on companies productivity. This study therefore examines the impact of ICT investment on the performance of sachet water companies a sub sector of Small Medium Enterprise (SME) in Oyo state, Nigeria. The study was carried out on 60 randomly selected sachet water companies that registered with National Agency for Food and Drug Administration and Control (NAFDAC) and Association of Table Water Association Producers (ATWAP). Both primary and secondary data were used in the study. While the later was obtained from the book of accounts of the selected sachet water companies the primary data was collected with the aid of questionnaires and scheduled interviews conducted to the staffers of all categories in these companies. The data were subsequently analyzed using both descriptive (percentages and tables) and inferential statistic that includes Cobb-Douglas production function which was used to measured productivity. The study revealed that substantial proportion of respondents strongly agreed that the firm used mobile phone to communicate with customers. A striking result was that all the respondents unanimously responded in affirmative to breakdown and malfunctioning of ICT devices. However, 96.7% of the respondents confirmed the problem of irregular electric power supply as constraints militating against ICT usage. Years of existence of the companies, capital base and educational level of the manager have significant effects on the extent of ICT usage. Also to evaluate the effects of ICT investment on companies productivity, the three variables that were found to have significant effect on companies performance were ICT capital, non-ICT capital and ICT labour while non-ICT labour does not have any significant effect on companies performance. The study concluded that ICT investment had positive effects on the performance of selected sachet water companies in Nigeria. Based on these findings, it was recommended that sachet water companies should be ICT compliance.

Key words: ICT, productivity, investment, SMEs, manager, Nigeria

INTRODUCTION

The emergence of Information and Communication Technology (ICT) is not only reshaping the business models but also connecting enterprises across its internal as well as external value chain. In other words, business enterprises are in the process of major transformation in order to meet the challenges of ICT driven economy. ICT is a complex and heterogeneneous set of goods, applications and services used to produce, distribute, process and transform information. They include the outputs of companies such as television and radio broadcasting, computer hardware and software, computer services and electronic media (e.g., the internet, e-mail) commerce and computer games (Adelaja, 2004). Laudon and Laudon (1991) claimed that managers cannot ignore information system because it plays a crucial role in contemporary organization. In this study, it was pointed out that the entire cash flow of most fortune 500 companies was linked to information system. ICT directly affects how managers decide, plan and what products and services are produced. Adetayo *et al*. (1999) and Boyett and Boyett (1995), emphazised the effect of ICT on business and the effect of business on ICT. It was maintained that in order to succeed (or even survive) in this dynamic world, companies must take not only traditional actions such as lowering cost but also keep pace with ever changing capabilities of ICT. Sachet water companies in Nigeria have continue to invest numerous sum of money into acquisition of ICT, so there is need to justify this huge sum of money invested on its procurement.

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There are a lot of problems presently militating against the development of the SMEs sector in Nigeria. These according to Adelaja (2004) and Ihua (2009) include obsolete technologies and machineries, lack of access to modern technology, lack or limited access to management support and technical advisory services, poor access to information on raw materials, infrastructure inadequacy and lack of social support just to mention a few. Some of these problems can be resolved by the application of ICT. The role of ICT in advancing the growth of national economies through enhanced efficiency and productivity and expanded market reach is both undisputed and irreversible. It is to this vein that adequate and strategic attention be placed so that these new opportunities provided by ICT are not limited and accessible only to the larger corporations within national economies (King and Teo, 1994; APCICT, 2007). Extensive research has been conducted in the last 20 years on the business benefits and value generated by ICT investments and their impact on business performance. From the mid l980's until the mid 1990's, little empirical evidence of a positive and statistically significant relation between ICT investment and business performance. One of the first studies in this area was conducted by Roach (1987) who measured the productivity of information workers against that of production workers. He found that during the 1970 through the mid 1980's the productivity of production workers increased by 16.9% while the productivity of information workers decreased by 6.9%, despite the big IT investments.

Many studies had been carried out on SME's in term of their financing and others but there is scanty information with regards to how ICT investment has affected productivity of the sachet water companies in Nigeria. And as a result of increasing use of ICT by sachet water companies, there is a need to justify the huge sum of money invested on its procurement. The extent to which sachet water companies adopt ICT device varies from one company to another, some may be of ICT compliance while others may not those that invested on ICT have been able to identified different problems militating against usage; notable among these problems are inadequate power supply, breaking down and malfunctioning of computer, poor awareness of ICT application and lack of fund to invest on ICT. Despite all these problems the question to what extent has sachet water companies uses ICT device to enhance their productivity remained unanswered. It is from this that the present study examined the effect of ICT investment on the on productivity of selected sachet water companies. Complimentary factors such as (years of existence, capital, educational level and ownership structure) when properly align influence the pay off from ICT investment; previous studies have shown that managerial practice influence the pay off from ICT investment (Brynjolfsson and Hitt, 1996; Melville *et al*., 2004; Dewan and Kraemer, 2000; Bresnahan *et al*., 2002). This study will also examine effect of management practice on ICT usage by SMEs. The researchs sought to test two major hypothesis that include management practice of the sachet water companies' do not have significant effect on ICT usage and investments on ICT have no significant effects on productivity.

MATERIALS AND METHODS

The study area and population: The study was carried out in Oyo state, South West Nigeria. The state has a total population of 5,591,585 out of the country's total population of about 140 million. It is located between latitudes 2°38' and 4°35' East of the Greenwich meridian. The state covers an area of 28,454 km^2 (2,845,400 H). The choice of Oyo state is not unconnected with fact that it has a high degree of socio-economic activities and serve as a settlement state that accommodate a lot of people from other parts of the country which consequently lead to its rapid market expansion. Emphasis was on 60 selected sachet water companies out of those that are registered with NAFDAC and ATWAP and are still in existence and producing sachet water.

Primary survey shows that there are about 300 sachet water companies that registered with NAFDAC and ATWAP in Oyo state. Out of these, only 168 are located in Ibadan and Ogbomsoso towns in Oyo state and are still in existence. The registered sachet water factories were selected from NAFDAC year Gazette book and ATWAP record book after a primary survey has been conducted.

Conceptual framework: The economic theory of production places certain technical constraints on the choice of the functional form such as quasi-concavity and monotonicity. Furthermore, as multiple inputs used in industrial production, the industrial production function form should display sufficient flexibility to allow continuous adjustment between inputs as relative factor prices change. The simplest production function form consistent with these constraints is the Cobb-Douglas specification which has been extensively used by researchers, e.g., Barua *et al*. (1991) and Brynjolfsson and Hitt (1996) in economic study for the estimation of the contribution of various firm inputs to firm output. Extended form of the Cobb-Douglas production function which has been used in the past in similar studies (Brynjolfsson and Hitt, 1996; OECD, 2003; Melvile *et al*.,

2004). The theory of production states that the inputs (i) a firm uses can be related to output (Q) via a production Function (F). The production function framework has been the most widely used methodology in the study of returns on IT investments (Berndt and Malone, 1995; Loveman, 1994; Lichtenberg, 1995; Brynjolfsson and Hitt, 1996; Adewoye, 2007).

In the absence of measures of actual benefits associated with ICT, it is not possible to perform cost-benefit analysis of ICT investments and thus, production functions which relate ICT spending to overall productivity or output measures are seen as the best alternative (Berndt and Malone, 1995).

Four parameters were used as inputs in the Cobb-Douglas production function to make relative comparisons about contributions to output. Thus, according to this methodology, the Cobb-Douglas production function becomes (Brynjolfson and Hitt, 1996):

$$Q = f(CKSL) \quad (1)$$

Where:

Q = Output of the firm
C = ICT capital
K = Non-IT capital
S = ICT labour expenses
L = Non-ICT labour expenses

However, different issues may be addressed with production function approaches. Thus, while Bryntolfsson and Hitt (1996) or Lichtenberg (1995) addressed the impact of IT on productivity; Barua *et al.* (1991) were concerned with its impact on profitability. Previous studies have further separated the IT-components of capital and labour expenses from the non-IT components and used all four parameters as inputs in the Cobb-Douglas production function.

In productivity perspective, the focus is on IT as an enabler of internal efficiency. From this point of view, information and communication technology freely available to all firms as it is does not provide any sustainable competitive advantage to the firm and in such an environment, ICT investment becomes more of a strategic necessity rather than a provides of competitive advantage (Clemons and Row, 1991). Thus, the firm's investments in ICT should not be associated with supra normal profits.

Production function model explained: A production function in line with the Cobb-Douglas is written for the study thus:

$$Y = f(X_1, Y_2, ..., X_n) \quad (2)$$

This Cobb-Douglas production functions parametise the relationship between dependent variable (y) and the independent variables ($X_1 \ldots\ldots X_n$). To make relative comparisons about contributions to output, the function is linearised by taking logarithms of Eq. 2 and adding an error term. This is done by using a system of five equations, one for each year as follows:

$$Log(y) = \alpha + Log_1(X_1) + Log_2(X_2) + Log_3(X_3) + Log_4(X_4) + e \quad (3)$$

Where:

Y = Output
$X_1 \ldots X_n$ = Inputs
α = Constant
e = Error term

These equations were used to explain the relationship between the dependent variable (productivity) and the independent variables (ICT-investments). Cobb-Douglas production function was used to test two things:

- The effect of the input on the productivity (positively or negatively)
- To know if the effect is significant or not

Empirical findings on theories of competitive strategy: The theory of production predicts that lower prices for ICT will create benefits in the form of lower production costs for a given level of output; it is silent on the question of whether firms will gain competitive advantage and therefore higher profits. For that is a need to turn to the business strategy field and the literature on barriers to entry. Porter and Millar (1985) emphasized that in a competitive market with free entry, firm can not earn sustainable supranormal profits because that would encourage other firms to enter and drive down prices. Although, there is the possibility of exploiting an unusually profitable opportunity in the short-run, long-man accounting profits will be just enough to pay for the cost of capital and compensate the owner for any unique inputs to production that they provide.

Accordingly, if a firm has unique access to ICT then the firm may be in a position to earn higher profits from that access. On the other hand, ICT will not confer supranormal profits to any firm in factories if it is freely available to all participants.

In this case, there is no reason to expect, a priori that a firm spending more (or less) on ICT then its competitors will have higher profits. If all firms use the amount of ICT they consider optimal in equilibrium none will gain a competitive advantage from it. This is consistent with the

argument of Clemons and Row (1991) that ICT has become a strategic necessity but not a source of competitive advantage.

Data collection instruments: There are about 300 sachet water companies that registered with NAFDAC and ATWAP from 1999-2009 in Oyo state out of which only 200 are in existence in Oyo state while 168 were located in Ibadan and Ogbomoso. The focus of this study was on 60 selected sachet water companies that fulfilled the condition of judgmental sampling techniques. They were selected randomly from the Ibadan and Ogbomoso geopolitical zones of Oyo state. The data covered 2 years before ICT acquisition and 2 years after ICT acquisition. This information is required to measure the effect of ICT investment on productivity.

Two research instruments were used in this study to generate primary data and they were questionnaire administration and interview schedules. Different set of questionnaires were designed and administered to companies' managers, computer engineer and customers. Firm manager questionnaire was designed to elucidate information about decisions on the types of ICT devices/technologies to be adopted, their procurement and operations, devices and on the distribution of ICT spending. Also, question was asked on the extent to which each sachet water companies uses ICT. Questionnaires for the computer engineer/computer operators was to elicit information on the available ICT related devices and on the distribution of ICT spending, ICT availability, usage and likely problems associated with the use of ICT devices in sachet water companies. Interview is intended to elicit more information that may hitherto be difficult to get through the use of questionnaires. Oral interview was conducted to corroborate and augment information generated from the questionnaire. An interview schedule listing the questions and noting their order of importance was prepared. This really helped to streamline the pattern of questions.

RESULTS AND DISCUSSION

Extent of the use of ICT devices: This refers to how sachet water companies have made used of available ICT devices. It also involves how various types of information technology devices are made available in each of the sachet water companies studied. Table 1 was used to display the availability of the devices in the sachet water companies studied. The responses of workers on the extent of the use of ICT devices were measured on a 5-point Likert type rating scale. The factors strongly agreed, agreed, disagree, strongly disagree and undecided were used to determine the extent of usage.

Regression analysis: The Ordinary Least Square Regression Model was used in the study. The mathematical expression for the least square regression for management practice is stated as:

$$C = f(X_1, X_2, X_3, X_4)$$

$$C = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e \quad (4)$$

Where:

C = Extent of usage
a = Constant
e = Error terms
b_1-b_4 = The parameter or coefficients
X_1-X_4 = The independent variables
X_1 = Company's years of existence
X_2 = Ownership type
X_3 = Capital base of the company
X_4 = Managers' educational level

Descriptive statistics: Descriptive statistic such as tables, percentages was also employed to present the results.

Extent of ICT usage: Data on the extent of ICT usage among the surveyed sachet pure water producing companies in the study area was gathered using 5-point Likert scale questionnaire. The result is as shown in Table 2.

Table 1: ICT usage indicators

Statements on ICT usage	SA(5)	A(4)	U(3)	D(2)	SD(1)
The firm use mobile phone to communicate with customers?					
The firm use mobile phone to order supplies?					
The firm use post box to communicate with customers?					
The firm use post box to order supplies?					
The firm uses the internet to communicate with customers?					
The firm uses the internet to order supplies?					
The firm sends SMS or text message for business purposes?					
The firm receives SMS or text message for business purposes?					
The firm use ICT devices for inventory control					
The firm use Koyo machine for production of sachet water?					

Adapted from Adewoye (2007) unpublished thesis; SA: Strongly Agreed; A: Agreed; SD: Strongly Disagreed; D: Disagreed; U: Undecided

Table 2: Manager responses on the extent of ICT usage

ICT usage index	SA	A	U	D	SD
The firm uses mobile phone to communicate with customers?	54 (90.0)	6 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)
The firm uses mobile phone to order supplies?	54 (90.0)	6 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)
The firm uses post box to communicate with customers?	16 (26.7)	6 (10.0)	4 (6.7)	7 (11.7)	27 (45.0)
The firm uses post box to order supplies?	15 (25.0)	6 (10.0)	6 (10.0)	6 (10.0)	27 (45.0)
The firm uses the internet to communicate with customers?	16 (26.7)	5 (8.3)	9 (15.0)	8 (13.3)	22 (36.7)
The firm uses the internet to order supplies of RM?	14 (23.3)	8 (13.3)	12 (20.0)	10 (16.7)	16 (26.7)
The firm sends SMS or text message for business purposes?	35 (58.3)	9 (15.0)	5 (8.3)	7 (11.7)	4 (6.7)
The firm receives SMS or text message for business purposes?	38 (63.3)	7 (11.7)	6 (10.0)	5 (8.3)	4 (6.7)
The firm use ICT devices for inventory control	17 (28.3)	13 (21.7)	17 (28.3)	3 (5.0)	10 (16.7)
The use of Koyo machine for production	54 (90.0)	6 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)

Figure in parenthesis are the percentage responses (Field Survey, 2010)

Table 3: Distribution of constraints militating against ICT usage among the companies

Problems	Yes	No	Total
Inadequate electric power supply hinder usage of ICT	58 (96.7)	2 (3.3)	60 (100)
Breakdown and malfunction of computer in the office affect adoption of ICT	60 (100.0)	0 (0.0)	60 (100)
Network/signal problems hinder adoption of ICT devices	54 (90.0)	6 (10.0)	60 (100)
Threats from cyber criminals and Insecurity of network affect usage of ICT devices in the manufacturing factories	52 (86.7)	8 (13.3)	60 (100)
Poor awareness of ICT application affects effective use of ICT devices	46 (76.7)	14 (23.3)	60 (100)
Non availability of ICT devices in remote/local areas affects its usage	52 (86.7)	8 (13.3)	60 (100)
The current economic recession is not in favour of adoption of ICT devices	14 (23.3)	46 (76.7)	60 (100)
Meeting the need of workers takes priority over investment in ICT device	19 (31.7)	41 (68.3)	60 (100)
The government policy on investment of ICT device is not in favour of enterprises	51 (85.0)	9 (15.0)	60 (100)
Adoption of ICT devices require expertise to train the workers	45 (75.0)	15 (25.0)	60 (100)
The result of investment in ICT has not measure up to the regulated standard for the factories	29 (48.3)	31 (51.7)	60 (100)
There is no enough fund to invest more on ICT devices by the factories	42 (70.0)	18 (30.0)	60 (100)

Field Survey, 2010

There is a homogenous response as regards the first, second and last statements as shown in Table 2. Most of the respondents (90.0%) strongly agreed that the firm used mobile phone to communicate with customers, the use of mobile phone to order supplies and the use of Koyo machines from production. Percentages were used to adequately categorize the respondent observation. The overall summary response of each of the stated question is as shown in the last column of Table 2.

Constraints militating against ICT Usage: Further analysis on the constraints militating against ICT use among the sachet pure water companies was also investigated with the Yes or No, responses by the staffers to ten statement problems as shown in Table 3. The result on Table 3 shows that all the respondents unanimously responded in affirmative to breakdown and malfunctioning of ICT devices which probably calls for more expertise in the area.

However, a well above average of the respondents confirmed the problem of irregular electric power supply (96.7%), network/signal problem (90%), threat from cyber criminals and insecurity of network (82.7%), non-availability of ICT devices in remote areas (86.7%) and the problem of lack of fund to invest in ICT devices by the factories (70%). The implication of the responses in Table 3 is that several reasons were responsible as constraints hindering the use of ICT in the area as indicated by the respondents.

Table 4: Cobb-Douglas production function model

Variables	Coefficient	t-values	p-values
Constant	-50.2588	-7.5410	0.0000
IT capital	3.5263***	9.3250	0.0000
NIT capital	0.9694***	3.2500	0.0020
IT labour	0.1677***	8.5360	0.0000
NIT labour	-0.7469	-1.0220	0.3110

Field Survey, 2009; $R^2 = 0.7345$; Adjusted $R^2 = 0.7152$; ***Significant at $p<0.01$; the Cobb-Douglas production function is as written: Productivity = -50.2588 + 3.5263 ICT capital + 0.9694 NICT capital + 0.1677 ICT labour - 0.7469 NICT labour

Effect of ICT usage on productivity: Towards achieving the objective of the study which is to evaluate the effect of ICT investment on productivity of the selected sachet pure water companies, a Cobb-Douglas production function was utilized. The dependent variable is productivity; this is estimated by dividing the output of the company by the labour employed. The explanatory or independent variables were ICT capital, non-ICT capitals, ICT labour and non-ICT labour following (Adewoye, 2007). The production function employed is further justified given its wide use in productivity analysis. The result is as shown in Table 4. Three of the four variables included in the model were significant; they are ICT capital, non-ICT capital and ICT labour while non-ICT labour was not significant. The adjusted R^2 is 0.7152 implying 71.52% of the variation in the productivity of the sachet pure water companies is being explained by the included variables in the model. The F-value is 17.53 and it is also significant ($p<0.01$) which tells us that there

exist a joint effect of all the explanatory variables. The coefficient of ICT capital is significant ($p<0.01$) and positive. This expressly implies that investment in ICT significantly increases productivity. The coefficient is 3.5263 and it shows that a unit increase in ICT capital leads to 3.5263 unit increase in the productivity of the companies. A similar results exist for non-ICT capital and ICT labour where the coefficient were both positive and significant ($p<0.01$). However, the coefficient of non-ICT labour is not significant and the sign is also negative. This probably sounds a caution note for the companies in that investment non-ICT labour would reduce the productivity potentials of the companies. However, a good management of the existing non-ICT labour would be an alternative.

Further deduction from the study is that of all the explanatory variables only ICT capitals is highly elastic, since the coefficient (3.5263) is >1 while others are inelastic. The hypothesis which states that investments on ICT have no significant effects on productivity is therefore rejected and it is concluded that ICT investments have significant effects on the productivity of the sachet water companies.

The study revealed that most of the respondents (90.0%) strongly agreed that the firm used mobile phone to communicate with customers and order supplies and use Koyo machine for production. However, a striking result is that all the respondents unanimously agreed to breakdown and malfunctioning of ICT devices. While (96.7%) of the respondents confirmed the problem of irregular electric power supply as constraints militating against ICT usage. Years of existence of the companies, capital base and educational level of the managers have significant effects on the extent of ICT usage with an adjusted R^2 of 0.6274.

Thus, confirming this is Bygrave state that socio economic characteristic like age, education, gender and experience proved to be a significant factor of firm's growth. The result also showed that age, education qualification has significance effect on selected small scale enterprise. The result of this present research is in line with the finding of the above researcher. This implies that 62.74% of the variation in the extent of ICT usage is being explained by the four variables considered in the model. The production function model showed that ICT capital, non-ICT capital and ICT labour have significant influences on the productivity of the companies while non-IT labour was not significant. R^2 is 0.7152 implying 71.52% of the variation. Of the significant variables, only IT capital is highly elastic since, the coefficient (3.5263) is >1 while others are inelastic. This corroborates the finding of Lichtenberg (1996) who used Cobb-Douglas production functions to determine the effect of ICT investment on firm's performance. The study reported a significant benefit of ICT investment. Brynfolfsson and Hitt (1996) also used Cobb-Douglas production functions and observe that computers contribute significantly to firm-level output. The paired sample t-test value of 1.809 which is significant ($p<0.1$) also implies that there is significant relationship between ICT investment and profitability of the companies. This negates findings of many previous studies. Brynjolfsson and Hitt (1996) stated that ICT investments affects productivity and contribute to consumer satisfaction but it does not necessarily improve profitability. Cobb-Douglas production function was used to test the effect of ICT investment on productivity. Four variables were used in the model namely; ICT capital, ICT labour, non-ICT capital non-ICT labour. Three out of these variables; ICT capital, ICT labour, non-ICT capital and the result were positive and statistically significant ($p<0.01$) whereas the result of non-ICT labour is not significant and the sign is negative with this investment in ICT has significant effect on productivity.

CONCLUSION

The results of the study also shows that labour requirement, salary and capital invested increased after ICT adoption. Corresponding returns were achieved with the total numbers of bags of sachet water produced.

RECOMMENDATIONS

In line with the findings of this research, it was recommended that sachet water company should be encouraged to adopt ICT devices such as automated machine (Koyo machine) and telecommunications (internet transaction and mobile phone) to enhance their performance while more expertise should be employee in machine and maintenance. The expertise should be mandated to train the existing worker (especially those at the lower level) on the nitty-gritty of the job for maximum productivity and also to face the challenges of new technology.

REFERENCES

APCICT, 2007. United nations development Programme-Asia-Pacific development information programme. (UNDP-APDIP) and Asian and Pacific Training Centre for Information and Communication Technology for Development. http://creative-commons.org/licenses/by/2.5/legalcode.

Adelaja, M.A., 2004. The role of smedan in the development of SME sector. Small and Medium Enterprises Development and SMIEIS, pp: 229-231.

Adetayo, J.O., S.A. Sanni and M.O. Ilori, 1999. The impact of information technology on product marketing: A case study of multinational factories in Nigeria. Technovation, 19: 691-699.

Adewoye, J.O., 2007. Impact of information technology investments on banking: Operations in Nigeria. Int. Bus. Manage., 1: 70-78.

Barua, A., C. Kriebel and T. Mukhopadhyay, 1991. Information technology business value: An analytical and Empirical Investigation. University of Texas at Austin Working Paper, May.

Berndt, E.R. and T.W. Malone, 1995. Information technology and productivity paradox: Getting the question right: guest editor's introduction to special issue. Econ. Innovation New Technol., 3: 177-182.

Boyett, J.H. and J.T. Boyett, 1995. Beyond Workplace 2000: Essential Strategies for the New American Corporation, Dutton, New Yark, ISBN: 9780525937821, Pages: 298.

Bresnahan, T.F., E. Brynjolfsson and L.M. Hitt, 2002. Information technology, workplace organization and the demand for skilled labor: Firm level evidence. Q. J. Econ., 117: 339-376.

Brynjolfsson, E. and L. Hitt, 1996. Paradox lost Firm-level evidence on the returns to information systems. Manage. Sci., 42: 541-558.

Clemons, E.K. and M.C. Row, 1991. Sustaining IT advantage: the role of structural differences. Manage. Inform. Syst. Quart., 15: 275-292.

Dewan, S. and K.L. Kraemer, 2000. Information technology and productivity: Evidence from country level data. Manage. Sci., 46: 548-562.

Ihua, U.B., 2009. SMEs key failure-factors. A comparison between the United Kingdom and Nigeria. J. Social Sci., 18: 199-207.

King, W.R. and T.S.H. Teo, 1994. Facilitators and inhibitors for strategic use of information technology. Inform. Manage., 27: 71-87.

Laudon, D.P. and J.P. Laudon, 1991. Business Information System: A Problem Solving Approach. College Publishers, New York, ISBN: 9780030304538, Pages: 631.

Lichtenberg, F., 1995. The output contributions of computer equipment and personnel: A firm level analysis. Econ. Innovation New Technol., 3: 201-217.

Lichtenberg, F., 1996. The output contributions of computer equipment and personnel: A firm-level analysis. National Bureau of Economic Research (NBER) Working Paper No. 4540. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=249505.

Loveman, G.W., 1994. An Assessment of the Productivity Impact of Information Technologies. In: Information Technology and the Corporation of the 1990: Research Studies, Allen, T. and M.M.S. Scott (Eds.). Oxford University Press, London, pp: 84-110.

Melville, N., K. Kraemer and V. Gurbaxani, 2004. Review: Information technology and organizational performance: An integrative model of IT business value. Manage. Inform. Syst. Quart., 28: 283-322.

OECD, 2003. IT and economic growth: Evidence from OECD countries, factories and firms. Organisation for Economic Co-operation and Development, Paris, France.

Porter, M.E. and V.E. Millar, 1985. How information gives you competitive advantage. Harv. Bus. Rev., 63: 149-160.

Roach, S.S., 1987. America's Technology Dilemma: A Profile of the Information Economy. Morgan Stanley, New York, USA., Pages: 29.