INFORMATION AND COMMUNICATION TECHNOLOGIES AS DRIVERS OF GROWTH: EXPERIENCE FROM SELECTED SMALL-SCALE BUSINESSES IN RURAL SOUTHWEST NIGERIA

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Abstract

The pervasiveness of information and communication technologies (ICTs) from cell phones to low cost videos, digital cameras, television, internets and laptops to mention just a few has transformed the lives of many especially the rural folks. Recent advances in ICTs have resulted in expanding existing jobs and creating new opportunities some of which were unimaginable only a few decades ago. The result has been significant worldwide and especially in developing countries like Nigeria where over three-quarter of her inhabitants rely on small-scale non-farm businesses and agriculture as means of livelihood. ICTs have therefore become an indispensable tool in fighting poverty and actualizing pro-poor growth. The result presented here relied on data collected from a random sample of 350 small-scale business owners in Southwest Nigeria. Analysis of respondents' socioeconomic characteristics revealed average age to be 44 years. Respondents' distribution by educational status showed that only about one-quarter were educated up to tertiary level with about 43 percent having no formal education. Occupational distribution of respondents showed farming as the highest employer of labour providing livelihood for over 67 percent of those interviewed. Analysis of available ICTs facilities revealed mobile phones, internet, television, radio, video cameras, digital cameras and cam-coders as the most widely used in the study area. Results further indicated cost reduction, ease of marketing and a quantum leap in the incomes of small-scale business owners as outcomes of ICTs penetration in the study area. Ranking of livelihood activities in the study area showed that small-scale businesses like trading, carpentry, brick-laying, barbing/hair-dressing, okada riding, vulcanizing, car-hiring, video clubbing as the most patronized. It is therefore suggested that effort should be intensified at building capacity of respondents through education. This is because education enhances adoption of new technologies and earning potentials of people. Improvement in the existing state of infrastructures should be made a policy priority to enhance accessibility to and affordability of ICTs.

Key words: Economic growth, ICTs, Rural, Small-scale businesses, Southwest Nigeria

Introduction

The last two decades have witnessed rapid and radical changes in all spheres with the rise of information society predicted by social scientists of the 1970's and 80's especially in developing countries of the world (Bell, 1973; Masuda, 1982). This is manifested in the pervasiveness of information and communication technologies (ICTs) - from cell phones, to low-cost video cameras, personal digital assistants, and laptops wirelessly connected to the internet has changed the way people live, work, and play. The Internet is without doubt the fastest growing communication technology today (Dlodlo and Sithole, 2001). It took only four years for the Internet to achieve the same mark as the television revolution, which took 13 years to reach 50 million viewers (Molosi, 2001).

Also, the increasing awareness and appreciation that ICTs impact on educational development, economic development through the expansion and growth of small and medium scale enterprises (SMEs), improvement in governance, environmental monitoring, health, security and human rights promotion to mention just a few has further brought ICTs to the fore in development discourse. The benefits arising from innovative technological solutions, products and services have therefore transformed and opened up new avenues for private entrepreneurs (small and big alike), governments, and civil society to work together to eradicate poverty, promote sustainable human development, accelerate economic growth, increase the efficiency of government services and facilitate integration of many countries into the global economy (Usman, 2010).

Meanwhile, there have been many discussions over the importance of SMEs to the economy although there is evidence to suggest that small firms do play a major role in the world economy (Timmons, 1994) and that they constitute the bulk of enterprises in all world economies (Storey, 1994). SMEs form a dynamic and important part of the economy in most developing countries. In fact, the contributions of SMEs to employment and some countries' gross domestic product (GDP) are by no means trivial. As of July 2006, close to 140 million SMEs in 130 countries employed 65 percent of the total labour force (IFC, 2006). These contributions according to UNDP (2005) can further be enhanced and strengthened through the use of ICTs that are increasingly transforming modern businesses by enabling the rapid, reliable and efficient exchange of large amounts of information. Access to and the use of ICTs by SMEs, particularly as a collective sector, will lead to greater job creation, increased public revenue and a general rise in the standard of living.

In Nigeria for instance, SMEs play a very significant role in terms of economic development as they provide the cornerstones on which Nigeria's economic growth and stability rests (Ojukwu, 2006). The

National Bureau of Statistics (formerly Federal Office of Statistics) reveals that about 97 percent of the entire enterprises in Nigeria are SMEs and they employ an average of 50 percent of the working population as well as contributing up to 50 percent to the country's industrial output (Ihua, 2009). The economic contribution of SMEs in Nigeria is significant (Apulu and Latham, 2009); hence, SMEs are regarded as a source of economic development (Ariyo, 1999). Research has shown that SMEs can increase their market reach, enhance customer service, and reduce both marketing and distribution cost with the use of ICT (Alam, Khatibi, Ahmad and Ishmail, 2007).

However, while ICTs are not a panacea for all development problems, they offer enormous opportunities to reduce social and economic inequalities, particularly those related to income generation, poverty reduction, education, health, environment and gender equity, and thus help achieve broader development goals especially in the rural areas (Apulu and Latham, 2009). Also, ICTs enhance SMEs' efficiency, reduce costs, and broaden market reach, both locally and globally. Since the SME sector plays a major role in national economies, these benefits to individual SMEs collectively translate into positive results in the form of job creation, revenue generation and overall country's competitiveness (UNDP, 2007). Small firms making intelligent use of ICTs to network can become "knowledge integrators" who benefit not only themselves but their other partners in the supply chain (Macpherson, Jones and Zhang, 2002).

According to Benkler (2006), increased use of a networked information helps to achieve competitiveness. ICTs are now seen as drivers of change for rural and agricultural development, since they are efficient tools for reaching rural and remote communities and for improving productivity (Richardson, 1997). ICTs have also been established to speed up the extension of development services in other areas that include healthcare, education and agriculture (Van Audenhove, 2003). Thus, ICTs can be instrumental in strengthening partnerships and in providing a framework for shared knowledge. In fact, technological convergence taking place in the ICTs' field globally, have also opened numerous possibilities that are rapidly transforming the way people work, live, play, and even the way we relate to one another.

From the foregoing, it is very clear that the growth of SMEs is very germane to Nigeria's economic transformation and the importance of ICTs in the life of any business (big or small) cannot be over-emphasized considering its transformative roles at expanding the scale of operation and enhancing the income of its owners. According to Utomi (2008, as cited in Ochefu, 2008), 'the future of Nigeria lies in the development of the SMEs, which also include its key players. No economy can grow if it does

not build up its SMEs. It is against this backdrop that this paper examines the growth-enhancing attributes of ICTs in SMEs in rural southwest Nigeria.

Literature Review

Defining ICTs and SMEs

Information and communication technology (ICTs) according to Parliamentary Office of Science and Technology (2006) can be defined as any technology that facilitates communication and assists in capturing, processing and transmitting information electronically. Akunyili (2010) defined information and communication technology (ICT) as an umbrella term that covers all technical means for processing and communicating information. In her own view, the convergence of information technology (IT) and telecom technology gave birth to ICT. Practically speaking, ICT finds expression in digital technology and all its uses and variants, including the computer, the internet, mobile telephony, the different electronic applications (e-banking, e-governance, e-commerce, etc), digital media and broadband technology. Some commonly used ICTs in many developing countries include radio, television and print media. Modern ICTs such as softwares, internet, fax, e-mails, mobile phones e.t.c. have become available to many countries worldwide in recent years and they are effective means of communicating knowledge and information to rural agricultural communities (Richardson, 1997; Kweku, 2006).

On the other hand, SMEs means different things to different people (schools of thought). However, the converging point has to do with its prime place as a major contributor to countries' economy. SMEs have been defined against various criteria such as the value of assets employed and the use of energy (Jutla, Bodorick and Dhaliwal, 2002). Meanwhile, there is no universally acceptable definition of SMEs in Nigeria as it has varied over time and from organisation to organisation (Lal, 2007). The National Association of Small and Medium Scale Enterprises defines SMEs as businesses employing less than 50 people and with an annual turnover of one hundred million Naira. This association further defines a medium scale enterprise as a business with less than 100 employees and with an annual turnover of five hundred million Naira. Also, the Central Bank of Nigeria and the Small and Medium Enterprises Equity Investment Scheme define SMEs as any enterprise with a maximum asset base of two hundred million Naira excluding land and working capital with its employees ranging between ten and three hundred (Lal, 2007). What is therefore important in these definitions is the relative position

of SMEs in Nigeria as it relates to employment generation and contribution to the country's gross domestic product.

Impact of ICTs on SMEs

Information and Communication Technologies (ICTs) can impact SMEs in three main ways; increase productivity in the production process, increase efficiency of internal business operations and connect SMEs more easily and cheaply to external contacts, whether locally or internationally. Although it is tempting to assume high levels of ICT use in expanding SMEs, it can be difficult to separate the effects of technology use from other factors since we could have some fast-growing firms that are not necessarily high ICT users (Locke, 2004). However, some recent studies do seem to indicate that the extent of ICT adoption is correlated with the bottom line of company balance sheets. Firms using e-mail for customer communication, for instance, can grow 3.4 percent faster in terms of sales than those which do not (Qiang, Clarke, & Halewood, 2006).

Again, ICTs will increasingly empower SMEs to participate in the knowledge economy by facilitating connectivity; helping to create and deliver products and services on a global scale, and providing access to new markets and new sources of competitive advantage to boost income growth (UNDP, 2007). Again business processes such as ordering, transaction, delivery, inventory control and accounting can be streamlined and connected regardless of location through the use of network of computers (UNCTAD, 2005). Further, computers supported by various types of business software can enhance information and knowledge management within a firm and result in an evolvement of better business processes and performance (OECD, 2004).

In general, empirical evidence from studies carried out in many countries, shows that ICTs may have several impacts (Krammer, Jenkins and Katz, 2007). For example, the effective use of ICTs may help firms gain market share at the cost of less productive firms, which could raise overall productivity. In addition, the use of ICTs may help firms innovate, e.g. by helping them to expand their product range, customise the services offered, or respond better to client demand. Moreover, ICTs may help reduce inefficiency in the use of capital and labour, e.g. by reducing inventories. The overall effects would all lead to higher productivity growth. ICTs now provide developing nations with an unprecedented opportunity to meet vital development goals such as poverty reduction, basic healthcare, and education, far more effectively than before. Those nations that succeeded in harnessing the potential of ICTs can look forward to greatly expand economic growth, dramatically improved human welfare and

stronger forms of democratic governance (Koffi Annan, 1997). Also, World Bank (2002, cited in IICD, 2006), also takes the position that "information and communication technologies are a key input for economic development and growth".

From the foregoing, it is very clear that the transformative role of ICTs cannot be overemphasized as it impacts on every facet of lives and economy in general.

Methodology

Study Area and Sources of Data

This study was conducted in Southwest Nigeria. Southwest Nigeria is made up of six states comprising Ekiti, Lagos, Ogun, Ondo, Osun and Oyo. The region is fairly urbanized but the larger part of the states are rural. Primary data for the study were collected from owners of SMEs from three out of the six states. Data were collected on respondents' socioeconomic characteristics, the different types of activities and enterprises (SMEs) engaged in, awareness and knowledge of ICTs usage and the diverse ways through which ICTs have assisted in shaping the fortune of their businesses in the study area. Information gathered were also complemented with personal observation.

Sampling Method

A multi-stage random sampling method was adopted in selecting three states from the region. The first stage of the sampling technique involves a random selection of three states - Ekiti, Ogun and Oyo. The second stage was a selection of three Local Government Areas (LGAs) from each of the selected states while the third stage was a random selection of two rural areas/villages in each of the selected LGAs and the last stage was a random selection SMEs and their owners. In all a total of 9 LGAs comprising of 18 different communities/villages were covered in the survey. About 400 questionnaire were administered but only 350 were used in the analysis. The rest were discarded because of incomplete information and poor administration.

Analytical Methods

In this study, a number of statistical tools were used in analysing the data. These include descriptive statistics (tables, frequencies and percentages) and tobit regression model. While ***Descriptive statistics*** was used to analyse, describe and summarise respondents' socioeconomic characteristics, different ICT facilities and SMEs available; the ***Tobit regression model*** was employed to ascertain the

determinants of ICTs' usage by SMEs' owners in the study area. Also, the different livelihood activities and ICTs facilities were ranked to determine their level of patronage by the respondents.

For the tobit regression model according to Wooldridge (2002) and Greene (2003) takes the form:

$$yi^{*} = X_i\beta + \varepsilon_i$$

Where, ε_i is normally distributed with mean zero and constant variance (i.e. $\varepsilon_i \sim N(0, \partial^2)$

y_i^{*} = Dependent variable (an index ranging between 0 and 1) = number of ICT facilities used divided by the total number of ICT available in the study area.

X_1-X_{10} = Explanatory variables

X_1 = Age of respondents (years)

X_2 = Gender (male = 1, female = 0)

X_3 = Household size

X_4 = Years of formal education

X_5 = Experience in business (years)

X_6 = Access to credit facility (yes = 1, no = 0)

X_7 = Membership of community association (yes =1, no = 0)

X_8 = Income (Naira)

X_9 = Primary occupation (farm = 1, non-farm = 0)

X_{10} = Number of SMEs

ε_i = Error term

Results and Discussion

Socioeconomic Characteristics of Respondents

In this study, a number of SME owners' socioeconomic characteristics were considered to ascertain their influence on operations of SMEs in the study area. Some of the characteristics considered include age, gender, household size and educational attainment level of respondents and the results of the analysis are presented below:

Age of respondents

Respondents' distribution by age indicates that a sizeable number of the respondents are still in their active working age with an average age of 44 years. In other words, operators of SMEs in rural

southwest Nigeria are youths with the age of over three-quarter of them (78.0 percent) ranging between 31 and 50 years. This therefore shows that owners of these SMEs are young and can easily adopt ICTs since the youth have often been described as agents of change in many societies.

Table 1: Age distribution of SMEs' owners (respondents)

Age	Frequency	Percentage (%)
≤ 30	32	9.1
31-40	163	46.6
41-50	72	20.5
51-60	38	10.9
> 60	45	28.9
Total	**350**	**100.0**

Source: Author's computation from field survey

Gender of Respondents

As shown in Table 2, it is very clear that there are more male owners (69.7 percent) of SMEs in rural southwest Nigeria than female owners (30.3 percent) and this is not unconnected with the fact that most men prefer to diversify their income source so as to be able to cater for their family. In fact, it was revealed from the survey that over three-quarter of the thriving SMEs in the study area are owned by men. Although this does not mean that there are no thriving SMEs owned by women but quite a good number of the women interviewed adduced increase in domestic responsibilities in the form of cooking, washing, going to market and taking care of their children and other family members among others as reasons for their inability to face their business squarely.

Table 2: Distribution of owners of SMEs by gender

Gender	Frequency	Percentage (%)
Male	244	69.7
Female	106	30.3
Total	**350**	**100.0**

Source: Author's computation from survey data

Educational Attainment of Respondents

Distribution of respondents by educational status as depicted in Table 3 shows that only about one quarter (26.3 percent) are educated up to tertiary level. More appalling is that about two-fifth (43.1 percent) have no formal education. The rest have either primary or secondary education. This distribution generally shows that educational attainment in southwest Nigeria is fairly low and this might hamper adoption of ICT facilities and the benefits inherent in its usage as well.

Table 3: Distribution of respondents by educational status

Educational status	Frequency	Percentage (%)
No formal education	151	43.1
Primary	65	18.6
Secondary	42	12.0
Tertiary	92	26.3
Total	**350**	**100.0**

Source: Author's computation from survey data

Household Size of Respondents

Going by respondents' distribution on the basis of household size, it is clear from Table 4 that household size in the study area is fairly large with a mean of 7. This might further explain the reason why an appreciable number of those interviewed are multiple job holders i.e. having one or two small businesses as a means of augmenting income from their primary occupation. Again, when household size is very large, it affects income per capita which in turn have some implications on the wellbeing of respondents. Thus, combining two or more businesses is a better way of diversifying livelihood sources and this directly or indirectly affects usage of ICT facilities.

Table 4: Respondents' distribution by household size

Household size	Frequency	Percentage (%)
1-3	59	16.9
4-6	121	34.6
7-9	96	27.4
9-12	44	12.5
> 12	30	8.6
Total	**350**	**100.0**

Source: Author's computation from survey data

Livelihood Activities (Primary Occupation) of Respondents

Distribution of owners of SMEs in rural southwest Nigeria as shown in Table 5 reveals that more than two-third (67 percent) of respondents rely on agriculture as their primary source of income. This is closely followed by those specialising in trading (buying and selling). Others are either civil servants (engaged in government salaried jobs), private salaried jobs or employed in the informal sector. This distribution generally reveals the relative importance of farming in southwest Nigeria and Nigeria in general because agriculture is the largest employer of labour in the country. In fact, those that are not directly engaged in farming (growing crops and raising livestock) are indirectly engaged through marketing of agricultural produce.

Table 5: Distribution of respondents by livelihood activities

Age	Frequency	Percentage (%)
Farming	234	66.9
Trading	47	13.4
Government salaried Job	25	9.5
Artisan	33	7.1
Private salaried job	11	3.1
Total	**350**	**100.0**

Source: Author's computation from survey data

Types of SMEs in Rural Southwest Nigeria

Going by the distribution of SMEs in Table 6, there are quite a number of SMEs in Nigeria and these include trading, bricklaying, tailoring, carpentry and auto-mechanics to mention just a few. From the table, it is clear that one of the notable SME is trading (buying and selling) with about 17 percent of those surveyed relying on this as their income source. Trading in rural southwest Nigeria ranges from buying and selling agricultural produce to manufactured goods and adoption of ICTs has assisted respondents (especially producers) in finding buyers for their produce. Trading is closely followed by tailoring or fashion designing with about 12 percent of the respondents engaged in it. Following this is barbing/hair dressing with about 11 percent of the respondents involved. The analysis depicted in Table 6 generally indicates that over one-third (39.2 percent) of SMEs in rural Nigeria (trading, barbing/hair dressing and tailoring/fashion designing) are gender-neutral indicating that both men and women are engaged in these activities. This does not mean that women are not engaged in the other SMEs but the distribution in terms of involvement is either skewed in favour of men or women. For instance, SMEs like vulcanizing and okada riding are usually skewed in favour of men but this does not mean that women are completely excluded in being owners of these two SMEs.

Table 6: Distribution of respondents by type of SMEs

Enterprise	Frequency	Percentage (%)
Petty Trading	58	16.6
Carpentry	10	2.9
Brick Laying	18	5.1
Barbing/Hair Dressing	37	10.6
Okada Riding	31	8.9
Vulcanizing	15	4.3
Car Hiring	12	3.4
Video Clubbing	25	7.1
Pottery	3	0.9
Gold-smiting	7	2.0
Rental Services	30	8.6
Baking	24	6.8
Tailoring/Fashion Designing	42	12.0

Welding/Fabrication	17	4.8
Auto-mechanics	21	6.0
Total	**350**	**100.0**

Source: Author's computation from survey data

Patronage of ICT facilities in Rural Southwest Nigeria

Patronage of ICT facilities in rural southwest Nigeria is a function of a number of factors and these range from the type of ICT facilities in question, age of users, gender, educational status, accessibility, affordability to infrastructure to mention just a few. However, going by the distribution depicted in Table 7, mobile phones is the most patronised of all the ICT facilities available in the study area and this is not unconnected with the rural telephony projects embarked upon by private entrepreneurs (local and foreign) in the country. The quantum leap in the use of mobile phones is attributed to its coverage and the ease with which it allows businesses to be transacted at minimal cost. In fact, this is why a sizeable number of SMEs invested heavily on this to ease their communication with potential clients in neighbouring villages or cities. Following this is the radio and television with 20.3 percent and 15.1 percent patronage respectively. The least patronised of all the ICT facilities in the study area is the fax messaging machine. This is attributed to lack of skill in using it and the power (electricity challenge). In fact, the advantage of mobile phones over all other ICT facilities is that it is very versatile in its operations and that once the battery is fully charged, it can last for days.

Table 7: Respondents' distribution by patronage of ICT facilities

ICT	Frequency	Percentage (%)
Mobile Phone	128	36.6
Internet	40	11.4
Television	53	15.1
Radio	71	20.3
Video camera	25	7.1
Digital camera	10	2.6
Camcorders	5	1.4
Fax	3	0.9
E-mail	16	4.6
Total	**350**	**100.0**

Source: Author's computation from survey data

Benefits of ICTs' Usage in SMEs

There is no gainsaying the fact that usage of ICTs impacts on SMEs. As shown in Table 8, owners of SMEs indicated cost reduction, ease of advertising and marketing, enhanced income, networking opportunities and reduction in losses arising from prolonged storage of manufactured goods as some of

the benefits of using ICT facilities. In fact about one-third (32 percent) indicated increased revenues from sales while about 23 percent reported wider market penetration as the gains of using ICTs. Also, about 18 percent indicated cost reduction in terms of money spent in conveying their products from the point of manufacture to the point of sale since most of these activities are performed either on phones or through engaging other ICT facilities available in the study area. Thus, it is clear that ICTs are drivers of growth in SMEs since a sizeable number were able to expand their businesses and even engage more hands as a result of ICTs' usage.

Table 8: Distribution of benefits of ICTs' usage in SMEs

Benefit	Frequency	Percentage (%)
Market accessibility	79	22.6
Increased income	112	32.0
Ease of marketing	46	13.1
Cost reduction	62	17.7
Networking	33	9.4
Reduction in loss due to storage	18	5.2
Total	**350**	**100.0**

Source: Author's computation from survey data

Determinants of ICTs' Usage in Rural Southwest Nigeria

In ascertaining what determines ICTs' usage in the study area, the effect of a number of respondents' socioeconomic characteristics and external factors were considered. From the result presented in Table 9; age, gender, household size, educational status, income, membership of community association and primary occupation were significant factors. While the coefficients of age ($p<0.10$), gender ($p<0.05$), educational level ($p<0.00$) and membership of community association ($p<0.05$) were positive, those of household size ($p<0.05$), income ($p<0.00$) and primary occupation ($p<0.10$) were negative. For example, as age and educational level of respondents increase, their usage of ICTs is enhanced because of experience and better exposure as a result of education. Again being a member of community association creates an avenue to learn new ideas and get up-to-date information which invariably translates to better usage of ICTs. On the other hand, as household size increases, usage of ICTs dwindles and this is due to the negative impact that large household size will have on income and as income level falls, usage of ICTs will fall. Also, those that are fully engaged in farming as primary occupation do not use ICTs as much as those engaged in non-farm activities. This could be the result of limited exposure on the part of these farmers and lack of interest because of their scale of operation.

Table 9: Tobit regression result on determinants of ICTs' usage

Variable	Coefficient
Age	2.145* (1.265)
Gender	0.047 ** (0.023)
Household size	-0.065** (0.029)
Years of formal education	1.173*** (0.352)
Experience in business	0.921 (1.021)
Access to credit facility	0.029 (0.032)
Membership of community association	0.655** (0.280)
Income	-0.723*** (0.198)
Primary occupation	-1.196* (0.708)
Number of SMEs	0.252 (0.155)
Constant	2.721 (0.623)

* Coefficients significant al 10 %; ** Coefficients significant at 5%; *** Coefficients significant at 1%;

Figures in parenthesis are standard errors; Number of observation = 350,

Log likelihood = -103.48342; Prob > chi2 = 0.0000

Source: Author's computation from survey data

Summary, Conclusion and Recommendations

There is no more gainsaying the fact that usage of ICTs has serious implications on SMEs. Some of the notable positive implications of ICTs' usage in rural southwest Nigeria include expansion, enhanced income, cost reduction and ease of advertising and marketing of produce. Again, on the ranking of

livelihood activities, farming remains the highest employer of labour providing income for more than half of the respondents either directly or indirectly. More so, educational status, membership of community association, gender of respondents were some of the significant factors explaining usage of ICTs in the study area. Based on the findings of this study, it is recommended that:

1. Effort should be geared at building capacity of respondents especially women through education since education enhances adoption of new technology which invariably leads to increased income.
2. Improvement in infrastructural facilities especially power (electricity) is very vital to enhance the usage and performance of ICT facilities. Virtually all ICTs facilities rely on power to function. In fact, the most patronised ICT facility (mobile phones) requires power to charge the batteries.
3. Awareness needs to be created and intensified on the need for family planning to control birth. Household size in rural southwest Nigeria is fairly large and this has serious implications on the income and wellbeing of these households which might eventually take a toll on their patronage of ICT facilities.
4. Respondents in the study area should be encouraged to form associations since this makes access to information possible and easy. In fact, these associations can even provide an avenue to access credit in the form of cooperative society and this might help boost the operations of SMEs in the study area.

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