

**TECHNOLOGY AND ENTREPRENEURIAL PERFORMANCE IN SOUTH EAST
GEOPOLITICAL ZONE, NIGERIA.**

AGBAJEOGU EVELYN NWA-AMAKA OCHI (PhD)
MADONNA UNIVERSITY NIGERIA
agbajeogueve@gmail.com
Phone No. +2348034721914

&
OKOLI IFEANYI EMMNUEL (PhD)
NNAMDI AZIKIWE UNIVERSITY, AWKA
Email: ifayol@yahoo.com
Phone No: +2348065140347

Abstract

This research work seek to explore the effect of business environment on entrepreneurial performance of small and medium enterprises in South East, Nigeria. It is specifically focused on technology and three indices for entrepreneurial performance namely, productivity, profitability and asset growth to establish if technology impacts on small and medium enterprises in South East, Nigeria. To guide the study three objectives were set. From these study's three objectives came three research questions and three hypotheses. The study had primarily relied on the questionnaire instrument and personal interview to generate data. A sample size of 400 was drawn from a frame of small and medium enterprises in South East, Nigeria. The data generated were presented and analyzed descriptively using simple frequencies, percentage and mean. Applying regressing analysis technique, the three hypotheses were rejected. The spearman correlation coefficient analysis at 5% level of significance for non-parametric data told the degree of correlation between the variables. Hence, the study concluded that technology impacts on entrepreneurial performance of small and medium enterprises in South East, Nigeria. The study therefore recommended among others that the government should put in place adequate technological infrastructure in partnership with the private in order to facilitate small and medium enterprises in South East, Nigeria. Since it is noted, that technology is a key driver in the global business economy. This is revealed in this study that e-commerce reduces cost, promotes competition in a vendor centered market place that has no geographical boundaries.
Key words: technology, entrepreneurship, Business, environment, and Nigeria.

Background of the Study

Environment of Business plays a vital role in the performance of entrepreneurship business. There is a great relationship between environment and entrepreneurial activities. This is in affirmation with the World Bank assertion that improving the business environment leads to increased investment by the private sector; which in turn, generates more wealth, job creation, and enhances poverty alleviation. Muiyiwa (2013) noted that involving the private sector through consultation and dialogue; understanding as well as providing the private sector's needs and priorities will help improve the business environment. In this digital era technology is of paramount importance in the performance of entrepreneurship and also one of the variables in the environment of the business that has potential to affect entrepreneurial activities. This elucidates the fact that a healthy environment encourages entrepreneurial performance.

Entrepreneurial performance is an outcome achieved when an organization successfully formulates and implements a value creating strategy which enables customers receive a service or product of value greater than what they are willing to pay for (Barney, 2007). Therefore, organizations that have a better understanding of its external environment would be more likely to cope with threats and grasp opportunities, and hence obtain sustainable competitive advantages. The fit between organizations and their environments is proposed to be the most significant predictor of organizational survival and performance (Boyd and Fulk, 1996).

Nigeria business environment is inhibited by so many fundamental challenges such that impede the advancement of business and the development of the Nigeria economy such as low level of technology and social unrest. Most industries in Nigeria cannot compete globally due low level of technology. Low level of technology affects the operations, processes and services of entrepreneurs. This is because any organization that cannot utilize E-commerce both as productivity tool and as a marketing tool may have a tremendous disadvantage compared to its competitors.

From the foregoing, it is obvious that the effect of environment on organization varies from one situation to another. The environment suitable for the growth of particular business may be hostile to the survival of another business. Hence, this study seeks to investigate how technology affect productivity, profitability, and asset growth of entrepreneurial firms in Nigeria with reference to small and medium enterprises in South East, Nigeria.

Research Objectives

1. To investigate the effect of technology on productivity of small and medium (SME) firm in South East of Nigeria
2. To explore the effect of technology on profitability of small and medium (SME) firm in South East of Nigeria
3. To examine the effect of technology on asset growth of small and medium (SME) firm in South East of Nigeria

Research Questions

1. To what degree has technology affected productivity of the small and medium (SME) firm in South East, Nigeria?
2. To what extent has technology affected profitability of the small and medium (SME) firm in South East, Nigeria?
3. What is the extent of effects of technology on asset growth of the small and medium (SME) firm in South East, Nigeria?

Research Hypotheses

- H_{0,1}: There is no significant relationship between technology and productivity of the aluminum roofing in South East, Nigeria.
- H_{0,2}: There is no significant relationship between technology and profitability of the small and medium (SME) in South East, Nigeria.
- H_{0,3}: There is no significant relationship between internet and asset growth of the small and medium (SME) firm in South East, Nigeria.

TECHNOLOGY

The most pervasive factor in the environment is technology. Entrepreneurs are generally concerned with two components of the technological environment; the process of innovation and the process of technology transfer. The process of innovation refers to their efforts in the basic sciences to develop new technologies, processes, methods and products. While the process of technology transfer involves taking the new technology from the laboratory to the market, that is the transfer of science to useful products and applications (Ulterback (1974), Gruber, & Marguis, (1971)).

Technology has a variety of meaning, but as applied to the environment of business, it generally includes all the ways firms create value for their constituents'. Griffin, Ebert, Starke & Lang (2011) believe that technology includes all human knowledge, work methods, physical equipment, electronics and telecommunications, and various processing system that are used to perform business activities. Technology is applied within the organization; the forms and availability of that technology come from the macro environment. Nickels, McHugh & McHugh (2005: 14) assert that the various tools developed throughout history have changed the business environment tremendously, but few technological changes have had a more comprehensive and lasting impact on business than the emergence of information technology (IT)/information communication and technology (ICT).

Information communications technology as defined by U.S. Information Technology Association (ITA) is “a technology which studies, designs, develops, implements, supports or manages computer-based information systems, especially computer software and hardware programs”. Mkomange & Ajagbe (2012) posits that information communications technology involves the use of electronic computers and software to turn, store, protect, process, transfer, receive and retrieve information securely. The authors argues further that information technology is a devise among many other devices which managers can use to enhance efficiency through problem solving (Lowden & Lowden, 2001; Lasisi et al., 2012a). To some researchers, information technology connotes the processing of data or information through computers, in addition to the use of technologies from computing and telecommunications to process and disseminate information (Oladejo & Adereti, 2010; Lasisi et al., 2012b). It is now becoming common and frequently used in carrying out various businesses. Faithian & Mahdavi (2004) argues that information technology is an arm of technology which makes the “survey, usage and process of data possible in the areas of storage, manipulation, transfer, management, control and automated data preparation using hardware, software and NetWare”. Orlikowski & Gash (1992) put forward that it is any form of computer-based information system, including mainframe as well as microcomputer applications. In entrepreneurship firms, the range and strategic impacts of such systems are vast; for example, Xerox provides master production schedules on-line to suppliers to facilitate efficient deliveries, reduced inventory costs, and improved supplier relationships (Ajagbe & Ismail, 2014). According to Singh (2000), information technology is the capabilities offered to organizations by computers, software applications, and telecommunications to deliver data, information, and knowledge to individuals and processes. However, with regard to the concept of supplier relationships, Carr & Smeltzer (2002) defines information technology as the use of computerized purchasing systems, supplier links through electronic data interchange (EDI), and computer-to-computer links with key suppliers and finally information systems.

Researchers have suggested that the objectives of information technology usage in entrepreneurial firms are to provide better means of information and data messages in the form of written or printed records, electric, audio or video signals by using wires, cables and telecommunication techniques (Ajagbe et al., 2011a; Lasisi et al., 2012a; Ajagbe & Ismail, 2014; Solomon et al., 2014). Information technology plays a vital role in information handling due to developments such as reduction in computing and operation time, availability of files on video discs, use of T.V as convenient information display, telecommunication and satellite communication facilities such as internet, e-mail, skype, facebook and other platforms. Ajagbe et al. (2011b) suggests that the arrival of social media was instrumental to the interactive nature of the digital landscape. In other words, information technology aids easier communication of information among people.

Internet is one of the satellite facilities that represent a particularly profound change that will enable or force significant changes in organizational form and processes. The Internet's capability to empower consumers, support dynamic information exchanges among organizations, and "flatten" organizational hierarchies promises to result in new operational strategies, business models, service delivery modes, and management mechanisms. The changes will have such far-reaching implications that long span roofing aluminum manufacturing industry need to start preparing now to adopt the advanced Internet applications that are expected to appear in the near future. Organizations need to evaluate the potential and implications of new Internet technologies, adapt them to local needs and conditions, minimize the risks associated with new product and service deployment, and plan to demonstrate the value of their effort (National Research Council - 2000).

What is known as the Internet today has its roots in a network setup by the U.S. Department of Defense in the early 1970s. In that early form, it was called the Arpanet, established by the Advanced Research Projects Agency (ARPA). It connected various military and research sites, and was itself a research project in how to build reliable networks - in particular, about how to build networks that could withstand partial outages in the event of a war and still function. It was designed to require the minimum of information from the computer clients. Beginning in the late 1980s, the National Science Foundation (NSF), a federal agency, started expanding its own NSFNET, using the technology developed by Arpanet. This was done to allow campuses and research centers to use NSF's supercomputer sites. But the sharing of supercomputers also allowed the connected sites to share other things not related to the supercomputer centers. As people started to discover the benefits of the Internet, such as e- mail, and as NSF started to promote universal

educational access by funding college networks, Internet traffic and its popularity increased at an exponential level. Today, you cannot open a newspaper without finding some reference to the Internet. You cannot listen to the radio without hearing a company's web address announced as part of the advertisement. The Internet is becoming a major, multibillion-dollar, integral part of e-commerce business, and is estimated to have at least 200 million people e-commerce, as well as 14 million web sites (Wang and Hou 2003:p.18).

E-commerce means that commerce conducted over the Internet, most often via the World Wide Web. E-commerce can apply to purchases made through the Web or inventory transfers. A customer can order items from a vendor's Web site, paying with a credit card (the customer enters account information via the computer) or with a previously established cyber cash account. The transaction information is transmitted (usually by modem) to a financial institution for payment clearance and to the vendor for order fulfillment. Personal and account information is kept confidential through the use of "secured transactions" that use encryption technology (Sylvia, 1998). The Internet provides an opportunity to create markets, and serve customers in ways hitherto unimaginable. Wang and Hou (2003) observed that a couple of years ago many viewed electronic commerce as simply trading using online networks and EDI (Electronic Data Interchange). For them, the Internet was totally irrelevant and unsuitable for electronic commerce. Their views have changed! Many large companies and retailers are now flocking to the Internet particularly entrepreneurs in the South East, Nigeria. Internet is an intermediary for information exchange. Internet can store vast amounts of information. Internet has powerful means of searching. Lin, (1997) stated activities that can be performed through internet to include the following: Internet can organize, and disseminates information, Internet can offer interactively. Internet can facilitate the transaction of Information-based products. For sellers and buyers, all these functions can be achieved with lower cost than traditional ways. Internet can provide faithful reproduction of descriptive and experiential product information. Internet can provide a greatly expanded universe of offerings relative to what can be accessed now through local or catalog shopping. Internet can provide an efficient means of screening the offerings to find the most appealing options for more detailed consideration. Internet can provide unimpeded search across stores and brands and memory for past selection, which simplifies information searching and purchase decisions (Lin, 1997). These are various ways in which Internet can be used as a source of added value and competitive advantage for an enterprise.

Also, Kalakota and Whinston, (2001) identified the benefit of internet to include the following:

- (a) Timeliness - Your Web site is accessible round the clock. Email queries can be handled more expeditiously and completely than is often possible by mail or phone;
 - (b) Reduced Marketing Costs - Online catalogues are cheaper to produce and maintain than paper catalogues;
 - (c) Better Targeting - Internet communities are self-selecting. People with particular interests tend to visit particular places in Cyberspace. Customers find you, rather than vice versa;
 - (d) Greater Market Reach - Distance is no object.
 - (e) Sending information or exchanging messages costs virtually the same as someone locally. You don't need to pay expensive courier bills;
 - (f) Reduced communications costs - With electronic networking it cost virtually the same to send a message to 100 people as to one;
 - (g) Improved After Sales Service - By providing online support, customers can serve themselves for many of the common post-sales information needs
- Internet marketing is expanding rapidly and should not be slowed by publicity about security or reliability with browsers and World Wide Web (Web) servers(Wang and Hou, 2003). Electronic commerce is more viable every day, as solutions to problems emerge gradually. Using the Internet for customer service reduces paper glut and makes financial and other transactions easier. Electronic commerce reduces costs by promoting competition in a vendor-centered marketplace that has no geographical boundaries. E-commerce will still deliver sizable benefits in the form of improved customer and supplier relationships and a reduction in the costs of advertising and the like (McFadden, 1996).

Relationship with Suppliers

Due to problems coordinating with external suppliers, large firms often produce many of their required inputs in-house. Brynjolfsson and Hitt (2000) assert that technologies such as electronic data

interchange, Internet-based procurement systems, and other inter-organizational information systems have significantly reduced the cost, time and other difficulties of interacting with suppliers. Johnston and Vitale, (1988), confirmed that firms can place orders with suppliers and receive confirmations electronically, eliminating paperwork and the delays and errors associated with manual processing of purchase orders. Greater benefits can be realized when inter-organizational systems are combined with new methods of working with suppliers.

Computer-based supply chain integration has been especially sophisticated in the consumer packaged goods industries. For example traditionally, manufacturers promoted products such as soap and laundry detergent by offering discounts, rebates, or even cash payments to retailers to stock and sell their products Brynjolfsson and Hitt (2000). This is because many consumer products have long shelf lives, retailers tended to buy massive amounts during promotional periods, which increased volatility in manufacturing schedules and distorted manufacturers' view of their market. In reaction, manufacturers sped up their packaging changes to discourage stockpiling of products and developed internal audit departments to monitor retailers' purchasing behavior for contractual violations (Clemons, 1993). To eliminate these inefficiencies, Procter and Gamble pioneered a program called "efficient consumer response" (McKenney and Clark, 1995). In this approach, each retailer's checkout scanner data goes directly to the manufacturer; ordering, payments, and invoicing are fully automated through electronic data interchange; products are continuously replenished on a daily basis; and promotional efforts are replaced by an emphasis on "everyday low pricing." Manufacturers also involved themselves more in inventory decisions and moved toward "category management," where a lead manufacturer would take responsibility for an entire retail category, determining stocking levels for their own and other manufacturers' products, as well as complementary items.

These changes, in combination, greatly improved efficiency. Consumers benefited from lower prices and increased product variety, convenience, and innovation. Without the direct computer-computer links to scanner data and the electronic transfer of payments and invoices, they could not have attained the levels of speed and accuracy needed to implement such a system Brynjolfsson and Hitt (2000).

Again, technological innovations related to the commercialization of the Internet have dramatically decreased the cost of building electronic supply chain links. Computer-enabled procurement and on-line markets enable a reduction in input costs through a combination of reduced procurement time and more predictable deliveries, which reduces the need for buffer inventories and reduces spoilage for perishable products, reduced price due to increasing price transparency and the ease of price shopping, and reduced direct costs of purchase order and invoice processing. Where they can be implemented, these innovations are estimated to lower the costs of purchased inputs by 10 to 40 percent, depending on the industry (Goldman Sachs, 1999).

Customer Relationships

The Internet has opened up a new range of possibilities for enriching interactions with customers. Dell Computer has succeeded in attracting customer orders and improving service by placing configuration, ordering, and technical support capabilities on the web (Rangan and Bell, 1999). It coupled this change with systems and work practice changes that emphasize just-in-time inventory management, build-to-order production systems, and tight integration between sales and production planning. Dell has implemented a consumer-driven build-to-order business model, rather than using the traditional build-to-stock model of selling computers through retail stores, which gives Dell as much as a 10 percent advantage over its rivals in production cost. Some of these savings represent the elimination of wholesale distribution and retailing costs. Others reflect substantially lower levels of inventory throughout the distribution channel. However, a subtle but important by-product of these changes in production and distribution is that Dell can be more responsive to customers. When Intel releases a new microprocessor, as it does several times each year, Dell can sell it to customers within seven days compared to eight weeks or more for some less Internet-enabled competitors. This is a nontrivial difference in an industry where adoption of new technology and obsolescence of old technology is rapid, margins are thin, and many component prices drop by 3 to 4 percent each month Brynjolfsson and Hitt (2000).

Other firms have also built closer relations with their customer via the web and related technologies. For instance, web retailers like Amazon.com provide personalized recommendations to visitors and allow them to customize numerous aspects of their shopping experience. As described by Denise Caruso (1998), "Amazon's on-line account maintenance system provides its customers with secure access to everything about their account at any time. Such information flow to and from customers would paralyze most old-line companies." Merely providing Internet access to a traditional bookstore would have had a relatively minimal impact without the cluster of other changes implemented by firms like Amazon Brynjolfsson and Hitt (2000).

Miranda & Banˆegil (2004) considered three sets of factors to assess the content quality of a Web site to include: informational, communicational, and transactional.

E-information

Firms can use their Web sites to disseminate corporate or commercial information to customers, business partners, or other stakeholders (shareholders, employees, the public, etc.) (Huizingh, 2000). Corporate information can provide insight into the background of the company (financial statements, employment offers, quality certificates, etc.) and commercial information implies providing product-related information, such as prices, specifications, terms of delivery, etc. At the same time, corporate Web sites usually present technical characteristics (search engine and site map) which help to locate available information within the company's Web site Meronˆo-Cerdan and Pedro Soto-Acosto (2007). Therefore, e-information is considered as a Web orientation that consists of one-way company electronic information directed to one or more stakeholders. This information is of a corporate or commercial nature and is beyond basic business information such as contact details. The degree of e-information of the business' Web site is thereby reflected by the extent of available information about the firm and its products and services.

E-communication

Internet communications, besides allowing a cost reduction in comparison to traditional communication tools, offer a unique opportunity for interacting with several business agents (both internal and external to the organization). Certain cost-effective and user-friendly applications such as e-mail, the Web forum and the

Feedback form allow unsynchronized two-way conversations Meronˆo-Cerdan and Pedro Soto-Acosto (2007). Furthermore, the creation of Web forums could form the basis of online communities where people can exchange views. In this sense, all these Internet technologies facilitate the exchange of information and collaboration.

Meronˆo-Cerdan and Pedro Soto-Acosto(2007) stated that the difference between e-information and e-communication is that the latter permits two-way information exchange. This exchange of information can vary from more structured tools such as the request for information form to more open and interactive forms such as the online chat. As a result, the degree of e-communication of the Web site is estimated by the extent of available communication mechanisms through which a business agent can interact with a firm or with other business agents (using the business' Web site as the Web platform). Basu & Kumar, (2002) assert that work has shifted from the creation of tangible goods to the flow of information through the value chain. The establishment and development of workflow processes has played a fundamental role in organizational transition.

According to the Workflow Management Coalition (WFMC, 2004), a workflow is 'the automation of a business process, in whole or in part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules'. Internet technology provides great opportunity for automation of processes. Thus, e-transaction is considered a Web site orientation that involves the establishment of electronic processes for the fulfillment of orders through the firm's Web site.

E-transaction

Over the past 20 years the economy has rapidly transformed from its traditional base to a new, information-based economy. In this new environment, work has shifted from the creation of tangible goods to the flow of information through the value chain (Basu & Kumar, 2002). The establishment and development of workflow processes has played a fundamental role in this transition.

According to the Workflow Management Coalition (WFMC, 2004), a workflow is ‘the automation of a business process, in whole or in part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules’. Internet technology provides great opportunity for automation of processes. Thus, e-transaction is considered a Web site orientation that involves the establishment of electronic processes for the fulfillment of orders through the firm’s Web site.

It against this backdrop that this study suggested that there is a relationship between technology and productivity, profitability, and asset growth of entrepreneurial firms in South East, Nigeria.

Methodology

The survey research design was used for the purpose of this study. The questionnaire was the major instrument used to collect data from senior and junior staff of small and medium enterprises (SME) in South East of Nigeria. The researcher focused on selected small and medium (SME) companies in South East, Nigeria listed in SMEDAN & National Bureau of Statistics (2013) collaborative studies sheet. The five States that make up the South East geopolitical zone were considered for the study namely, Abia, Anambra, Ebonyi, Enugu and Imo State. According to SMEDAN & National Bureau of Statistics (2013), there is a total of seven thousand and sixty one (7061) small and medium (SME) firms in the South Eastern geopolitical zone of Nigeria. The various SME’s established in this States are classified into sixteen (16) various sectors such as: Manufacturing; Mining and Quarrying; Accommodation and Food Services; Agriculture; Wholesale/Retail Trade; Construction; Transport and Storage; Financial Intermediation; Real Estate, Renting, Business Activities; Information and Communication; Education; Administrative and Support Activities; Health and Social Works, Arts, Entertainment and Recreation; Other Services and or Activities; and Water Supply, Sewage, Waste Management and Remediation Act (SMEDAN & NBS, 2013). The seventy thousand and sixty-one (7061) SME firms are distributed as shown in table 1 below:

Table 1: Distribution of Small and Medium Scale Enterprises and its employment rate in the South East Geopolitical Zone of Nigeria for the year 2013

S/No.	State	Small	Medium	Total	Male Employed	Female Employed	Total Employment
1	Abia	1769	40	1809	28851	11062	39913
2	Anambra	1620	117	1737	20570	9781	30351
3	Ebonyi	1206	4	1210	24223	6000	30223
4	Enugu	812	99	911	12687	15603	28290
5	Imo	1259	135	1394	14924	26315	41239
	Total	6666	395	7061	101255	68761	170016

Source: SMEDAN and National Bureau of Statistics Collaborative Survey: selected Findings (2013)

Therefore, there is a total population of 7061 SME companies in South East Geopolitical Zone in Nigeria selected for the survey.

The next population to consider for this study relates to the total number of employees engaged by these organizations which is also reported by SMEDAN & NBS (2013). The employees’ population is 170016 (million, seven hundred and sixteen) workers. The population size of the present study consists of the one million, seven hundred and sixteen (170016) employees spread across the different sixteen (16) SME sectors in South East geopolitical zone of Nigeria. This study comprises of senior and junior staffs in administrative, operations, marketing and accounting units constitute the major population of this study. The sample size for the study is obtained using two various approach, namely: Using published tables by Glenn in 1992 as cited by Singh & Masuku, 2014 (See table 2 below) and using a simplified formula by Taro Yamane in 1967 as cited by Alugbuo, Umeaka & Eriama (2012). Table 2: Published tables by Glenn in 1992 by Singh & Masuku (2014)

Table 2: Sample Size for ±5% and ±10% Precision Levels where Confidence Level is 95% and P = 0.5.

Source: Singh & Masuku, 2014

Glenn’s published tables for estimating sample size reported that a sample size (n) of 400 should be used for a study in a situation where there is a population above 100,000, under 5% precision level where

Size of Population	Sample size (n) ±5%	For precision (e) ±10%
000	222	83
1,000	200	91
2,000	333	95
3,000	353	97
4,000	364	98
5,000	370	98
7,000	378	99
9,000	383	99
10,000	385	99
15,000	390	99
20,000	392	100
25,000	394	100
50,000	397	100
100,000	398	100
>100,000	400	100

confidence level is 95% and P=0.5 (see Table 2).

Using Taro Yamane formula, given as:

$$N = \frac{N}{1+N(e^2)}$$

Where

- n = Sample Size
- N = population size, and
- e = maximum allowance for sampling error, in our case, 5% or 0.05.

On making the appropriate substitutions, we have:

$$\text{Sample size (n)} = \frac{170016}{1+170016 \times (0.05^2)}$$

= **399.06** (i.e.: ≈ 400 respondents to be studied)

A sample size of 399 which is approximated to 400 was derived using Taro Yamane simplified formula which agrees to Glenn’s publishable table. Consequently, a sample of 400 respondents was used in the present study. The number of respondents included in the sample from each of the five (5) selected States is determined through proportional allocation from the computation of the sample size proportion. SME’s firms that participated in the study is determined using purposive sampling method as the researchers wished to study SME firms with not less than 50 employees and accessible.

This study adopted a non-probability sampling technique such as purposive sampling and probability sample like area or cluster sample. Area or cluster sampling is used when the population to be sampled is vast and spread over a wide geographical area (Akuezuilo (2002). While purposive sampling procedure is a type of sampling where the researcher handpicks his samples because to his judgment, they are typical of what the researcher wants and are representative of the sample. The approach is the most commonly used form of non-probability sample often recommended when a study focuses on a specific group (Osuala 2001: McNabb, 2008) and when the investigator considers the unique background of participant as consistent with goals of the study (Patton, 2000). Here, the representativeness of the sample is only assumed (Akuezuilo, 2002). A table of proportion was used to identify the number of subjects to draw from the target population.

To compute the sample size proportion, we use the formula:

$$k = \frac{w_i}{N} \times n$$

Where;

k = sample size proportion,

w_i = no. of respondents for individual firm

N = population size

n = sample size

Table2: Sample Size Proportion Distribution for the Study

S/No.	State	Total Employment	Sample Proportion	Size	Sample Size
1	Abia	39913	93.90		94
2	Anambra	30351	71.41		71
3	Ebonyi	30223	71.11		71
4	Enugu	28290	66.56		67
5	Imo	41239	97.02		97
	Total	170016	400		400

Table.2 shows the proportional allocation of the sample size for the study which will be randomly selected from the study population while the firms to be studied shall be purposively selected. Also members of the population have equal chance of being selected. This method was adopted by the researcher because of its simplicity to avoid bias judgment.

The data and information required for this study were collected from primary and secondary sources of data. Secondary data in this study were obtained from documented records, company newsletters, internet, books, processed information from publications and previous research covering the subject under study.

This study investigated the effect of political instability on entrepreneurial performance. This research therefore, relied on the questionnaire covering the effect of political instability on entrepreneurial performance via productivity, profitability and asset growth of small and medium enterprises in South East, Nigeria. The Likert 5 point scale of question 1 – 5 was adopted for the study. **1 = Very Low Extent, 2 = Low Extent, 3 = Moderate Extent, 4 = High Extent, 5 = Very High Extent**). Respondent were asked to rate their options in line with their opinions on the notion presented.

Copies of the questionnaire were personally hand delivered to the appropriate respondents. Phone calls were made to enhance the response rate as most employees may be preoccupied with official duties.

Experts in the field were employed to review the questions and properly aligning them with the objective. Also, the researcher used the test re-test method to establish external reliability.

For internal reliability, the statistical package for social science (SPSS) version 19 statistical package was used to calculate the reliability index. Cronbach’s alpha test confirmed internal reliability. If the ratio of the Cronbach’s Alpha is or above 0.60, then the reliability would have been proved. A pilot study was conducted to enable the researcher to determine the level of reliability for the instrument. The data gotten from the pilot survey were subjected to test of reliability using Cronbach alpha technique.

The data generated through the questionnaire instrument were properly sorted out. The essence of sorting out is to find out the questionnaire that will not be properly filled either by double ticking or by leaving up to 70% of the total number of questions not answered. Again, the questionnaire were properly coded so as to avoid double coding of a particular questionnaire. The sorted data were fed into the spreadsheet for processing and data analysed using SPSS version 19, then results were obtained.

The data were analyzed descriptively and inferentially, the descriptive analysis involved frequencies, means, charts and standard deviation. For inferential analysis the correlation analysis was used to give inferential meaning to the generated data.

**Data Analysis
Response Rate**

The study targeted 400 personnel working in small and medium enterprises within the South Eastern States in Nigeria. The respondents distributed 400 copies of questionnaire, and the 400 were properly filled for the study giving a response rate of 100% needed. The data were analyzed using statistical package for social sciences (SPSS) version 19 and the analysis is given below.

The data analysis was carried out with the use of descriptive and inferential statistics in relation with the research questions and hypotheses earlier raised.

Data Analysis

Response Rate

The study targeted 400 personnel working in small and medium enterprises within the South Eastern States in Nigeria. The respondents distributed 400 copies of questionnaire, and the 400 were properly filled for the study giving a response rate of 100% needed. The data were analyzed using statistical package for social sciences (SPSS) version 19 and the analysis is given below.

The data analysis was carried out with the use of descriptive and inferential statistics in relation with the research questions and hypotheses earlier raised.

Re-stating the Research Question 1, 2, and 3:

- 1 To what degree has technology affected productivity of the small and medium (SME) firm in South East, Nigeria?
- 2 To what extent has technology affected profitability of the small and medium (SME) firm in South East, Nigeria?
3. What is the extent of effect of technology on asset growth of the small and medium (SME) firm in South East, Nigeria?

Findings from Research Question 1, 2, and 3

Table 3: Correlation Analysis Result of Technology on Performance

		Correlations			
		Technology Impact	Productivity	Profitability	Asset Growth
Technology Impact	Pearson Correlation	1	.137	.134	.125
	Sig. (2-tailed)		.006	.007	.012
	N	400	400	400	400
Productivity	Pearson Correlation	.137	1	.278	-.199
	Sig. (2-tailed)	.006		.000	.000
	N	400	400	400	400
Profitability	Pearson Correlation	.134	.278	1	-.195
	Sig. (2-tailed)	.007	.000		.000
	N	400	400	400	400
Asset Growth	Pearson Correlation	.125	-.199	-.195	1
	Sig. (2-tailed)	.012	.000	.000	
	N	400	400	400	400

Source: SPSS 19 Output 2023

Table 3 reports the correlation analysis result for technology on performance. Technology has about 13.7% level of effect on the productivity, about 13.4% level of effect on profitability and 12.5% level of effect on asset growth of small and medium (SME) firm in South East, Nigeria as the accounts a correlation coefficient of 0.137, 0.134 and 0.125 respectively. The result have shown that technology impacts on the different indices of performance (productivity, profitability and asset growth) positively, though the result showed that it had a weak but significant influence on them.

Table 4: The Mean Responses by the respondents on the extent technology impacts on performance of the small and medium (SME) firm in South East of Nigeria

S/No.	Technology Impact	5	4	3	2	1	Mean	Decision
24	Through the use of Internet, e-commerce transactions can reduce the cost of operation in South East small and medium (SME) firm	181	165	36	12	6	4.26	High Extent
25	Through the use of Internet, e-commerce transactions can enhance a competitive position in firm.	163	159	48	24	6	4.12	High Extent
26	Through the use of the right technology, South East SME firm can reduce expenses of printing.	177	169	36	12	6	4.25	High Extent
27	Through the use of Internet, Small and medium enterprises (SME) in South East, Nigeria can reduce personnel expenses.	127	181	24	39	29	3.85	High Extent
28	Through the use of Internet Small and medium enterprises (SME) in South East, Nigeria can reduce the need for posting of mails.	158	112	34	83	13	3.80	High Extent
29	Through the use of Internet, there is frequent interaction in Small and medium enterprises (SME) in South East, Nigeria with the stakeholders.	178	176	40	2	4	4.31	High Extent
30	Through the use of Internet, Small and medium enterprises (SME) in South East, Nigeria goals are consistently met or exceeded.	188	187	25	0	0	4.41	High Extent
31	Internet enhances the productivity of Small and medium enterprises (SME) in South East, Nigeria	182	172	40	2	4	4.32	High Extent
32	Internet enhances the profitability of Small and medium enterprises (SME) in South East, Nigeria	221	188	11	0	0	4.53	High Extent
33	Internet enhances the asset growth of Small and medium enterprises (SME) in South East, Nigeria	168	203	29	0	0	4.35	High Extent
				Grand Mean			4.22	High Extent

Researcher’s Field Survey, 2023

Note: 1 = Very Low Extent, 2 = Low Extent, 3 = Moderate Extent, 4 = High Extent, 5 = Very High Extent.

The table 4 above presents the mean and standard deviation of responses by the respondents on the extent technology impacts on performance of the small and medium (SME) firm in South East of Nigeria. There are 10 items statements covering responses on extent technology impacts on performance of the small and medium (SME) firm in South East of Nigeria. The result reports a total number of 400 respondents participated on the survey. The results were scaled in 5 points including “1 = Very Low Extent, 2 = Low Extent, 3 = Moderate Extent, 4 = High Extent, 5 = Very High Extent”. The result reports that technology affect performance of the small and medium (SME) firm in South East of Nigeria to a high extent as it accounts a mean 4.22. The result has also indicated the responses by the respondents per each item statement, reporting that the respondents reported to a high extent that item statement on the use of Internet, e-commerce transactions can reduce the cost of operation in South East small and medium (SME) firm (\bar{x} of 4.26); that through the use of Internet, e-commerce transactions can enhance a competitive position in firm (\bar{x} of 4.12); that through the use of the right technology, South East SME firm can reduce expenses of printing (\bar{x} of 4.25); that through the use of Internet, Small and medium enterprises (SME) in South East, Nigeria can reduce personnel expenses (\bar{x} of 3.85); that through the use of Internet Small and medium enterprises (SME) in South East, Nigeria can reduce the need for posting of mails (\bar{x} of 3.80); that through the use of Internet, there is frequent interaction in Small and medium enterprises (SME) in South East, Nigeria with the stakeholders (\bar{x} of 4.31); that through the use of Internet, Small and medium enterprises (SME) in South East, Nigeria goals are consistently met or exceeded accounting (\bar{x} of 4.41); Internet enhances the productivity of Small and medium enterprises (SME) in South East, Nigeria (\bar{x} of 4.32); Internet enhances the profitability of Small and medium enterprises (SME) in South East, Nigeria (accounting a mean of 4.53) and Internet enhances the asset growth of Small and medium enterprises (SME) in South East, Nigeria accounting a mean of 4.35.

Hypothesis 1: There is no significant relationship between technology and productivity of the small and medium enterprise in South East, Nigeria

Table 5: Model Summary Result between technology and productivity of the small and medium (SME) firm in South East, Nigeria

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.137 ^a	.019	.016	1.353	.019	7.580	1	398	.006

a. Predictors: (Constant), Technology Impact

See Annexe2 for detailed Analysis Output

The result on table 5 presents the model summary result between inflation and asset growth of the small and medium (SME) firm in South East, Nigeria. The result discloses the regression analysis output from SPSS version 19 reporting a p-value of 0.006, a correlation coefficient of 0.137 and R² of 0.019. The result shows a p – value ≤ 0.05 level of significance; therefore rejecting the null hypothesis and accepting the alternative stating that there is a significant relationship between technology and productivity of the small and medium enterprise in South East, Nigeria.

The result has also presented a regression model of:

Where regression model= $\alpha + \beta(x_1)$ --- (1)
 productivity = 1.350 + 0.592 (Technology)

The result disclosed in the model shows that for SME firms in South East, Nigeria, as technology usage increases, the higher the productivity.

Hypothesis 2: There is no significant relationship between technology and profitability of the small and medium (SME) in South East, Nigeria.

Table 6: Model Summary Result between technology and profitability of the small and medium (SME) firm in South East, Nigeria

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.134 ^a	.018	.016	1.381	.018	7.318	1	398	.007

a. Predictors: (Constant), Technology Impact

The result on table 6 presents the model summary between the technology and profitability. The result discloses a p-value of 0.007 with a correlation coefficient of 0.134 and R² of 0.018. The result shows a p-value ≤ 0.05 level of significance; therefore rejecting the null hypothesis and accepting the alternative stating that there is a significant relationship between technology and profitability of the small and medium (SME) in South East, Nigeria.

The result has also presented a regression model of:

Where regression model = $\alpha + \beta(x_1)$ --- (1)

$$\text{Profitability} = 0.537 + 0.593 (\text{technology})$$

The result disclosed in the model shows that for SME firms in South East, Nigeria, as technology usage increases, the higher the profitability.

Hypothesis 3: There is no significant relationship between technology and asset growth of the small and medium (SME) firm in South East, Nigeria

Table 7: Model Summary Result between technology and asset growth of the small and medium (SME) firm in South East, Nigeria

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.125 ^a	.016	.013	.619	.016	6.345	1	398	.012

a. Predictors: (Constant), Technology Impact

See Annex 2 for detailed Analysis Output

The result on table 7 presents the model summary result between technology and asset growth of the small and medium (SME) firm in South East, Nigeria. The result discloses the regression analysis output from SPSS version 19 reporting a p-value of 0.012, a regression analysis output (R²) of 0.016 and a correlation coefficient of 0.125. The result shows a p-value ≤ 0.05 level of significance; therefore rejecting the null hypothesis and accepting the alternative stating that there is a significant relationship between technology and asset growth of the small and medium (SME) firm in South East, Nigeria.

The result has also presented a regression model of:

Where regression model = $\alpha + \beta(x_1)$ --- (1)

$$\text{Asset Growth} = 3.366 + 0.248 (\text{technology})$$

The result disclosed in the model shows that for SME firms in South East, Nigeria, as technology usage increases, the higher the asset growth.

Findings

1. The 1st null hypothesis was rejected after testing, therefore accepting the alternative and concluding that there is a significant relationship between technology and productivity of the small and medium enterprise firms in South East, Nigeria. The result has reported that technology could only account for 13.7% level of effect on productivity of small and medium enterprise firms in South East, Nigeria; though the result accounted for a positive but a weak/low relationship existing.
2. The 2nd hypothesis tested was rejected and a decision of accepting the alternative was upheld therefore reporting that there is a significant relationship between technology and profitability of

the small and medium (SME) in South East, Nigeria. The result has reported that technology could explain about 13.4% level of effect on productivity, therefore reporting a weak/low level of impact and a positive relationship existing.

3. The result also accounted for a significant relationship between technology and asset growth of the small and medium (SME) firm in South East, Nigeria as the null hypothesis was rejected and the alternative accepted. The study could only record about 12.5% level of effect associating with technology and asset growth. This association recorded was reported positive and a weak/low impact level.

4. Technology Impact

1. From the responses of the respondent in the 10 item statements stated; majority of the respondent assert to a high extent that technology has effects on entrepreneurial performance. As such, the correlation coefficient result analysis shows that there is a positive relationship between technology and performance indices such as productivity, profitability and asset growth. However, the result has a weak influence on these performance indices.

2. The positive effect of technology could be seen as one of the devices that have enhances entrepreneurs' efficiency through problem solving. Entrepreneurs can process data or information, disseminate information through computers. Entrepreneurs can do business today with e-commerce. That is commerce conducted over the internet. This in line with the work of Wang and Hou (2013) which revealed that e-commerce reduces cost by promoting competition in a vendor centered marketplace that has no geographical boundaries. Also that e-commerce delivers benefits in form of customer and supplier relationship and reduces costs of advertising.

3. Moreover in line with the findings of this report is the work of Goldman Sachs, (1999), their study revealed that internet have dramatically decreased the cost of building electronic supply chain links. The use of internet has reduced costs through a combination of reduced procurement time and more predictable deliveries, which reduces the need for buffer inventories and reduces spoilage for perishable goods, reduced prices due to increasing price transparency and the ease of price shopping.
4. The weak impact of technology on entrepreneurial performance could be leveled against the epileptic power supply, lack of managerial and technological knowhow, lack of competent engineers, and high cost of importation of spare parts and among others.
5. From the outcome of the selected macro business environmental factors on entrepreneurial performance shows that there is a relationship between the selected macro business environment and entrepreneurial performance. This shows that entrepreneurs need to interpret the trend in the environment before adapting to it.
6. Adaptive problems as seen in the findings of the study which causes weak influence of the selected macro business environmental factors on entrepreneurial performance are as follows: Enterprise interpretation experience which is to a great extent a determinant factor of its adaptability. Enterprise interpretation experience depends on the size and nature of the organization which links to the structure of the organization, lack of security, cost of running generator, lack of confidence, low level of technology, power supply, lack of engineers, resource characteristics etc. These are the major adaptive problems identified in the findings of the study. They are organizational factors which are not within the scope of this study.

Conclusion

Based on the analyzed statistical data on the impact of technology on the performance of small and medium enterprises in South East, Nigeria, the study concluded thus:

That the use of technological devices such as internet will enhance entrepreneurs' efficiency through problem solving. Entrepreneurs can process data or information, disseminate information through computers. Entrepreneurs can do business today with e-commerce. That is commerce conducted over the internet. E-commerce reduces cost by promoting competition in a vendor centered marketplace that has no geographical boundaries. E-commerce delivers benefits in form of customer and supplier relationship and reduces costs of advertising enhances entrepreneurial performance.

Recommendations

Based on the conclusion of the study the following recommendations were made:

1. That entrepreneurs should embrace effective and efficient application of technology in the day to day running of their business. Technology facilitates business activities as well as rapid growth and development. As it is revealed in this study that entrepreneurs can process data, disseminate information, conduct business over the internet. These activities have potential to increase performance of entrepreneurship.
2. Enterprises should adopt formal and scientific strategies in the implementation of information and communications technology. This is because this study has revealed that lack of managerial and technological knowhow and lack of competent engineers hinders entrepreneurial performance.
3. The government should put in place adequate technological infrastructure in partnership with the private in order to facilitate small and medium enterprises in South East, Nigeria. Since it is noted, that technology is a key driver in the global business economy. This is revealed in this study that e-commerce reduces cost, promotes competition in a vendor centered market place that has no geographical boundaries.
4. The study recommends the need to enhance the technological skill and managerial knowhow of entrepreneurs for optimal utilization of their resources. As it is evidenced in this study that technology has reduced costs through a combination of reduced procurement time and more predictable deliveries, which reduces the need for buffer inventories and reduces spoilage for perishable goods, reduced prices due to increasing price transparency and ease of price shopping which enhances entrepreneurial performance.

References

- Agbajeogu, E. N. O (2017), "Macro Business Environmental Factors and Entrepreneurial Performance: A study of Selected Small and Medium Enterprises (SMEs) in South East, Nigeria." PhD Thesis, Imo State University, Owerri, Nigeria (Unpublished).
- Ajagbe, A. M. and Ismail, K. (2014). Factors Influencing Venture Capital Assessment of High Growth Companies in Malaysia. *International Journal of Entrepreneurship and Small Business*, 21(4), 457-494.
- Ajagbe, A. M., Eluwa, E. S., Duncan, E. E., Mkomange, C. W. and Lasisi, A. N. (2011a). The Implications of Social Networking Sites on Education in Nigeria. *Interdisciplinary Journal of Contemporary Research in Business*, 3(7), 93-101.
- Akuezuilo, E. O (2002), *Research and Statistics in Education and Social Science*. Nuel Centi Publishers and Academic Press Ltd, 3, Ezi-Abba Awka, Nigeria.
- Alugbuo, C. C. (2005), *A Practical Guide for Project Writing*. Owerri, Credo Publication.
- Barney, J. B. (2007). Gaining and sustaining competitive advantage, 3rd Edition. *Pearson International Edition*.
- Basu, A. and Kumar, A. (2002) Research commentary: workflow management
- Boyd, B. K., & Fulk, J. (1996). Executive scanning and perceived uncertainty: A multidimensional model. *Journal of Management*, 22, 1-21.
- Brynjolfsson, E. and M. Hitt, L. M. (2000), Beyond Computation: Information Technology, Organizational Transformation and Business.
- Carr, A. S. and Smeltzer, L. R. (2002). The Relationship between Information Technology use and Buyer-Supplier Relationships: An exploratory analysis of the buying firm's perspective. *IEEE Transactions on Engineering Management*, 49(3), 293-304.

Fathian, M. and Mahdavi, N. H. (2004). "Information Technology Management and Principles", Science and Industry University's Publications, sixth edition for South African Higher Education Institutions. Informing Science, 931-943.

Goldman Sachs. (1999). *B2B: To Be or Not 2B? High Technology Group Whitepaper, November*. Griffin, Ebert, Starke & Lang (2011), Business. Pearson's Education, Inc. Upper Saddle River, New Jersey, USA.

Huizingh, E. (2000), *The Content and Design of Web sites: an Empirical Study*. *Information & Management* 37(3), 123–134.

Kalakota, R. & Whinston, A.B. (1996). *Frontier of business*. New York: Addison-Wesley, pp.78-79.

Lasisi, N. A., Ahmed, M. and Ajagbe, A. M. (2012a). Samba Open Ldap Performance in a Simulated Environment. *International Journal of Computer Science and Information Technology & Security*, 2(3), 503- 509.

Lin, P. Y. (1997). *The Relationship between Internet and Business Success in Taiwan*. Master's thesis, National Taiwan University, pp. 97-98.

Lin, Z. and K.M. Carley (1997), "Organizational Response: The Cost Performance Tradeoff," *Management Science*, 43(2), 217–234.

Lowden, K. C. and Lowden, J. P. (2001). *Information Technology*, Translated by Hamid Mohseni, Tehran, Ketabdar Publication.

McFadden, M. *Commerce on the Net (reprinted from Digital Age)*, *Soft Base*, 48(1).

McHugh J.M., McHugh S. M. And Nickels, W. G., (2005), *Understanding business 7th ed.* McGraw-Hill, Irwin.

Meron~o-Cerdan, A. L., and Pedro, S.A. (2007), *External Web Content and its Influence on Organizational Performance*. *European Journal of Information Systems*, 16, 66–80.

Miranda, F. J. and BAN~ EGIL, T. M. (2004), *Quantitative evaluation of commercial Web sites: an empirical study of Spanish firms*. *International Journal of Information Management* 24(4), 313–328.

Mkomange, C.W. and Ajagbe, A. M. (2012). The Roles and Importance of Technology in Mathematics Teaching and Learning-A Literature Review. *Interdisciplinary Journal of Contemporary Research in Business*, 3(11), 476- 486.

Muyiwa, A. O. (2013). *Impact of Business Environment on Entrepreneurship Performance in Nigeria*. *Computing information System, Development Informatics & Allied Research*, Vol. 4 No. 4 pp 59 -66.

National Research Council (2000), *Organizational Challenges to the Adoption of the Internet - Networking ...*<https://www.ncbi.nlm.nih.gov/NCBI/Literature>

Oladejo, M. O. and Adereti, A. S. (2010). The Impact of Information Technology on the Performance of Micro finance Institutions in Nigeria. *Journal of Economic Development and Managerial Studies*, 1(1), April edition.

Orlikowski, W. and Gash, D. (1992). „Changing Frames: Understanding Technological Change in organization“, Center for Information Systems Research, Working Paper, Massachusetts Institute of Technology.

Rangan, V. and M. Bell. 1998. *Dell Online*. Harvard Business School Case Study 9-598-116.

Singh, S. N. (2000). "Impact of Information Technology on Biomedical Information Centres and Libraries in India: A Critical Evaluation." Ph.D diss., University of Rajasthan, page140.

Wang, J. and Hou, F.H (2003). *Research on the Relationship between the Internet Usages and the Organizational Performance in the Taiwanese E-commerce Business Organizations*. www.informingscience.com.

WFMC (2004), *Workflow Management Coalition* (<http://wfmc.org>).