

Effect of Technology on Entrepreneurial Performance of Small Scale Firms in Enugu State

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Abstract: The study of Effect of Technology on Entrepreneurial performance of Small Scale Firms in Enugu State was carried out to examine the extent technology failure affect the overall performance of small scale firms in Enugu State. The need for this arose due to the prevalent failure of small scale firms in Enugu. The study adopted a descriptive research design. 315 sample size was drawn from a population of 1, 480 small scale firm. Data was presented in tables and analyzed using percentages. Formulated hypotheses was tested using t-test statistics. The study revealed that technology failure affects the overall performance of small scale firms in Enugu significantly and positively base don calculated value 8.31 critical value of t(0.64) on this note, the study recommends RAMELA compliance test of technology in organization's before application.

Key words: Technology • Firms and entrepreneurial

INTRODUCTION

Background of the Study: Nigeria in line with other countries of the world has widely acknowledged entrepreneurial development, especially the small scale businesses as a spring board for sustainable economic development. In line with this therefore, Nigerian government has shown increased interest in small scale businesses for some reasons such as: the failure of past industrial policies to generate efficient self sustaining growth, increased emphasis on self reliant approach to development and the recognition that dynamic and growing small scale businesses can contribute substantially to a wide range of developmental objectives. These objectives Okongwu (2004) [1] states as efficient use of resources, employment generation, mobilization of domestic savings for investment, encouragement, expansion and development of indigenous entrepreneurship and technology as well as income distributions.

Technology is found in its various forms in entrepreneurial organizations, the service sector state institutions, manufacturing companies, educational

establishments and multinational organisation. The question is what is performance of entrepreneurial organizations?

Adeyomo and Olatunji (2004) [2] state that technology is the totality of effort involved in the application of basic results and experimental findings to exploitation of nature for the benefit of man. From this therefore it is obvious that technology has been used to improve the quality of life through the development of tools and know how that reduced man's drudgery in business and economic development. Appropriate technology is the application of know-how or skill, that is one's capacity which can be best utilized in solving a specific problem.

It is the relevant technologies that can be suitably engaged in revenue generation, resulting in growth and expansion of business [2]

On this note, it is therefore worthy to state here that entrepreneurial performance of small scale firms entail growth of the businesses, expansion, increased profitability, increased market share and employment

generation. These can be achieved when appropriate technology is applied in the productive process of the business concern.

Appropriate technology therefore entails its test in terms of RAMELA compliance test which stands for reliability, affordability, maintenance, ease of learning and adaptability to the local environment. Against this, backdrop therefore, the need to carry out study on effect of technology on entrepreneurial performance of small scale businesses in Enugu State arise.

Statement of Problem: From the perspective of this study, it is important to note that appropriate application of appropriate technology in business entails increased performance of the business in terms of business growth, expansion, profitability, market share and employment generation. In spite of all these benefits to business from appropriate applications technology, most small scale business are yet key into this potent tool for business performance. The result being high mortality rate of small scale firms in Enugu. Resulting in low employment rate and increase in crime rate as our youth roam about streets in search of white collar job that is unavailable: Based on this therefore, the need to carry this study arose:

Objectives of the Study: From the foregoing, the following objective was set to guide the study. The broad objective being examine the effect of technology on the entrepreneurial performance of small scale firms in Enugu State.

- To examine the extent technology failure affects the overall performance of small scale firms in Enugu State.

Research Questions: The following research questions were stated to guide the study.

- To what extent does technology failure affect the overall performance of small scale firms in Enugu State?

Hypotheses: The following null hypotheses also served as a guide to the objectives of the study

- Technology failure test does not affect the overall performance of small scale firms in Enugu significantly and positively.

Review of the Related Literature

Conceptual Framework

Technological Variables in Small Scale Firms:

Technology is one of the most pervasive factors in firms. It refers to the sum total of knowledge, the ways things are done. This includes inventions, techniques and vast store of organized knowledge about every thing. Koontz, O'Donnell and Weorich (1980) [3] state that the main influence of technology is on the ways of doing things, on how we design, produce, distribute and sell goods as well as services. Technological variables include advances in basic sciences such as physics as well as materials. The level of technology in firms therefore determines to a large extent what products and services will be produced, what equipment will be used and how operations will be managed.

It is worthy of note that technological development begins with basic research through which a scientist discovers some new phenomenon or advances some new theory, other researchers then examine the breakthrough for its potential utility. At this point, if further developed leads to a workable prototype and engineering requirements, which in turn make commercial exploitation practical, then the technology is put to use and may widely be adopted. In Nigeria, government owned institutions such as universities and project development agencies such as PRODA and other conduct basic research, independent entrepreneurs, firms and government agencies carry the developments out of the laboratory and into market place, for test of compliance. this therefore shows that small scale firms are affected by the type of educational system, number of researchers and technocrat in a society. The impact of technology can be seen in new products, new machine, new tools, new materials and new services. A few of the benefits from technological variables are greater productivity, high living standards, products and greater employment opportunities.

In order to better appreciate the scope of technological changes, the following categories and examples are helpful:

- Increased ability to design new materials and change the properties of other so that they better serve needs.
- Increased ability to generate, store, transport and distribute energy such as electricity, unclear power.
- Mechanizations or automation of physical process.

- Mechanization or automation of certain mental process e.g. computer, which greatly expands our ability to store and return information.
- Extension of human ability to sense things, the right vision instruments [3].

It is therefore necessary to analyze the technological environment in order to meet with the changes as well as the challenges.

Technological Environment: Technology being pervasive within contemporary organizations in various firms (small, medium and large scale firms).

It changes as new discoveries are being made on daily basis. David (2007) [4], posits that revolutionary technological changes and discoveries are having dramatic impact on organizations. One major breakthrough in technology is the internet which today serves as the economic engine that is spurring productivity, a critical factor in the world's ability to improve living standard and saving firms cost of distribution and transactions firm direct sales to self service system. Technological environment therefore represent a major opportunities and threats to the operation or performance of entrepreneurs.

Entrepreneurial Performance in Nigeria: Successful entrepreneurship creates value by combining resources in new different ways to gain competitive advantage over areas, thus at the heart of true entrepreneurship is the drive for creativity [5]. Creativity evolves from development of new idea, assessment of problems and opportunities for growth and expansion. Nigerian business environment is a dynamic and turbulent one. Small scale firms spring up every day, so also fails on daily basis. Nigerian governments through various agencies promote entrepreneurial activities, yet many small scale entrepreneurs find it difficult to grow and expand. Growth and expansion are two words or indices of performance that distinguish successful entrepreneurs from other business owners. The problems of growing small scale firms in Nigeria are most challenging. One problem with many Nigerian small scale entrepreneurs is succession problems i.e. the inability of their firms to survive after the exit of the entrepreneurs. Successful entrepreneurs are not contented with achievement of one goal; rather they see one achievement a launch pad for further achievements. The engagement of some Nigerian entrepreneurs in diversionary entrepreneurial behaviours such as chieftaincy titles and other social activities that result in unprofitable venture obviously leads to poor

performance. Therefore possession of critical mass of ability to manage growth are important requirement for nurturing nascent enterprises [6]. Murphy (1996) [7] state that the rewards for adoption of value and growth strategies are mostly expansion of operation increased profitability, attraction and development of quality manpower and enjoyment of negotiation power within the environment which include technological.

From the foregoing therefore, it is obvious that successful, growth oriented entrepreneurial behaviour is the ability to manage and maintain the positive relationship between the organizations and its technological environment by manipulating the environmental power dependences [8]. The attributes that are sine qua non for effective performance of small scale entrepreneurs include: drive, mental ability, human relation ability, communication ability, technical knowledge innovation, managerial training, self confidence, need for achievement, integrity and adaptability [9, 10, 11, 12, 13, 14, 15 and 16].

Theoretical Framework: The main theories adopted in this study are the seven key schools of thought on technology and organization context as identified by Mulins (1999) [13] namely. Technological determinations, social technical systems approaches, the social economic shaping of technology, technology as text and metaphor, processual approaches and radical/Marxist perspectives.

In all the school of thoughts, this study is more based on the social-technical systems approach (SST) which is located within the model of systems approach to the theorizing and analysis of organizational technical environment. It have a particular concern to find the "best fit" between social elements and technical element. Buchanan and Hukznslei (1997:56 observes that Trist et al 1963 argued that

an effective socio-technology system design could never fully satisfy the needs of either subsystem. This sub-optimization, is a necessary feature of good socio-technical design. There are trade-offs which must be accepted. Clearly a system designed with an emphasis on social needs and ignoring technical system needs could quickly run into technical problems. Conversely, a system designed according to only the demands of technology could be expected to generate social and organizational difficulties. What is required is a design approach aimed at joint optimization of the social and technical components and their requirements.

From the foregoing, McLoughlin and Clark (1994:56) notes that the final design is a matter of organizational choice not technological imperative. Where as for the technological determinists, the technology itself has by far and away the most influence.

Empirical Review: The study of effect of technology on organizational performance takes queue from the study of the effect of technological innovation on organizational performance of construction industry carried out by Mehrad, Mohammad and Mahmaz (2013). Here they laid emphasis on six era, that were titled: Science and Information Era; Post-Industry Era, Information Society Era, Temporary Communities Era; Speed Era And Invocation And Creativity Era. In nutshell they stated that the organizations and companies have provided themselves to manage the increasing changes and global great changing. The speed of developments is beyond the imaginations, in a way that creativity and innovation has been considered as one of the most important factors of organizational survival. They states that identifying the innovations factors providing conditions to maximize the level of creativity are one of the main plans and policies in developed countries to maintain sustainable development and are main policies of developing countries to each development. The gap in knowledge between the study and provides ones is that while organization's technological invocation on organizational performance and emphasized on other topics of innovation studies, this study tried to provide the best ways and policies to improve the organizational performance by recognizing of technological innovation. However, this study identifies RAMELA compliance test as the best way to utilize technology to the best advantage of performance. While their study was carried out in Middle East, this study was carried out in Nigeria.

MATERIALS AND METHODS

Descriptive research design method was adopted in the study. A sample size of 315 was drawn using Taro Yemeni method from the population of 1, 480 small scale. Firms in Enugu State dealing in six types of small business formulated hypotheses were tested using t-test statistical tool. The instrument for data collection was structured questionnaire.

Data Presentation and Analysis: In data presentation, a total of 315 copies of questionnaire were distributed and

285 were returned and valid. The study therefore based analysis on the valid return rate.

Analysis: Table 1 is derived from the valid responses of 285 respondents out of 315 copies of questionnaire distributed. The questionnaire measures the effect of technology on the performance of small scale entrepreneurial organizations studied based on (5) different attributes of acquired, of adopted or transferred technology in Nigerian environment.

These attributes are reliability, affordability, in terms of cost of acquisition and maintenance, ease of learning and adaptability of the technology to local environment. The expected frequency of responses is one thousand four hundred and twenty five (1425). Of this amount, 218 of the responses strongly disagree that technology will all this attributes will have significant effect in performance of the organization, while 242 responses disagree representing 15 and 17 percent respectively, while also representing 15 cumulative valid percentage of 32. A total of 10 responses represent cumulative percentage of 7 are undecided while 429 response agree and 436 responses strongly agree that technology with the attributes will significantly affect the organization performance. This also represents 30 percent and 31 valid percent of total frequency respectively. With a cumulative 61 valid percent. Clearly a greater proportion of the responses agree that technology with all the attributes mentioned will have significant effect on organizational performance. The average frequencies for the responses are strongly disagree (44); disagree (48). Undecided (20); agree (86) and strong disagree 87, these average responses will be used to test the hypothesis one.

Test of Hypotheses:

Ho: Technology failure do as not affect the performance of small scale firms in Enugu significantly and positively.
hi (alternate): Technology failure affect overall performance of small scale firms in Enugu significant and positively.

The sample size here is large, therefore t-test statistics is considered to be an appropriate test statistics and beside this, it offers good approximation of normal probability distribution when sample size is large. The average sample size derived in is used here in Table 2: showing the scores of Table 1 according to 5 points likert scale.

Table 1: Response on the extent technology failure affect overall performance of small scale firms in Enugu State.

Options	DA	DA	U	A	SA	Total
Last long in usage	40 (14%)	43 (15%)	25 (9%)	80 (28%)	97 (34%)	285
Low cost of acquisition	45 (26%)	43 (15%)	20 (7%)	87 (31%)	90 (32%)	285
Low cost maintenance	43 (15%)	44 (15%)	22 (8%)	89 (31%)	87 (31)	285
Ease operation	50 (18%)	52 (18%)	17 (6%)	18 (6%)	32 (29%)	285
Adaptable to local environment	40 (14%)	60 (21%)	15 (5%)	90 (32%)	80 (28%)	285
Total	21	24	10	42	43	1425
Cumulative Average	8 460 or 32%	2 48	0 7%	9 856 or 515%	6 87	285

Source: field study, 2013

Remarks	Scores X	Frequency F	Fx	(x-x) ²	F(x-x) ²
Strongly disagree	2	44	88	2.624	115.47
Disagree	3	48	144	0.384	18.45
Undecided	1	20	20	6.864	137.29
Agree	4	86	344	0.144	12.42
Strongly agree	5	87	435	1.904	165.68
Total		285	103	4	449.31
			1		

$$\text{Mean } (x) = (fx/f = 1031/258 = 3.62$$

$$\text{Population mean } (\mu) = \frac{1+2+3+4+5}{5} = \frac{15}{5} = 3.0$$

$$\text{Sample mean } (x) = (fx/f = 1031/258 = 3.62$$

$$\text{Sample variable } (S^2) = \frac{((x_i - x)^2)}{n-1} = \frac{449.31}{285-1} = \frac{449.31}{285} = 1.58$$

$$\text{Sample standard deviation } (S) = \sqrt{\frac{284}{1.58}} = 1.26$$

Formulating the null and alternate hypothesis.

H₀: $\mu < 3.00$ Accept null hypothesis if the calculated value of *t* is less than or equal to critical value (from *t*-distribution table) otherwise reject it and accept.

Alternate hypothesis $\mu > 3.00$

Calculating the value of *t*.

$$t(n-1) = \frac{x - (\mu)}{\frac{S}{\sqrt{n}}} = \frac{3.62 - 3.0}{\frac{1.26}{\sqrt{285}}} = \frac{0.62}{0.074635988}$$

$$\text{Calculated value of } t_{(284)} = 8.31$$

$$\text{Critical value of } t_{(284)} (0.05) = 1.645$$

Conclusion: Since the calculated value *t*(8.31) is greater than the critical value of *t*(.64) we reject the null hypothesis and accept the alternate hypothesis. We therefore conclude that technology which has the attribute of reliability, affordability maintenance, ease of learning and adaptability to the local environment have and positive significant effect on the performance of small scale firms Enugu State.

Discussion of Findings: The study looked at the effect of technology on organizational performance based on five different attributes of acquired adopted or transferred technology in Nigerian environment. These attributes are reliability, affordability, maintenance, ease of learning and adaptability to local environment. It revealed that 61 percent that states that any technology that are measured in terms of compliant test and found to have the attributes of reliability affordability, low cost of maintenance, ease of learning and adaptable to the local environment will significantly affect organizational performance in terms increase performance. This is a little different from

Woodward (1980) and Perrow (1970) that states that industrial organizations which design their formal organizational structure to fit the type of production technology they employ are likely to be commercially successful. In line with the finding, the tested hypothesis one using t-test of statistics confirmed that calculated value $t(8.31)$ is greater than the critical value of $t(1.64)$ from t-distribution table which made us to reject the null hypothesis and accepted the alternate hypotheses which also led us to conclude that technology that has the attribute of reliability, affordability, maintenance, ease of learning and adaptability to the local environment will significantly affect the performance of entrepreneurial organizations. In line with this therefore the literature looked at the problems that arise as a result of breakdown of machines and tools for productive activities which often times take valuable, man hours and cost of production during the repairs of such machines therefore the result of the study led us to look at the dimension of reducing the frequency of breakdown of technology for productive activities, hence our attention on the its suitability of Technology to the local environment rather than just the structure of the entrepreneurial organizations.

In conclusion therefore, it is obvious that technology significantly affect the overall performance of small scale firms in Enugu due to the fact that most Nigerian small business owners waste valuable time and incur expenses in repairing and maintaining broken down tools and equipments. The time and money would have been channelled into productive activities if the equipment was actually measured in terms of RAMELA complainant test.

The results of this study have shown that technology significantly affects the performance of organization, therefore, the study recommends that all technologies to be used in productive activities of business firms in Nigeria should undergo technological compliance test of reliability, affordability, maintenance, ease of learning and adaptability to the local environment before being used for productive activities. This is to reduce the frequency of breakdown of machines and tools and to avoid loss of valuable man hour and cost incurred during the period of repairs.

REFERENCES

1. Okongwu, S.A., 2004. Sources of Technology Acquisition for Small Scale Enterprises in Nigeria. In *Fundamental Issues in Entrepreneurship* edited by Okongwu D. and Saleh U.A., Lagos, Apex Books Ltd., pp: 179-203.
2. Adeyemo, F.S. and O. Olatunji, 2004. Technology Training for Small Scale Entrepreneurs. In *Fundamental Issues in Entrepreneurship* edited by Ouongwu D. and Saleh U.A. in Lagos, Apex Books Ltd., pp: 98-106.
3. Koontz H. O'Donnel and C. Wehrich, 1980. *Management, International Student* edition, Tokyo; McGraw Hill Book Company.
4. David, F.R., 2007. *Strategic Management Concepts and Cases*. India Darling Kindersley Int'L Ltd.
5. Osisoma, B.C., 2009. *Foundations of Entrepreneurship in Practical Entrepreneurship*. Publication of ANAN, Enugu; African Fep. Publishers Ltd.
6. Nkamnebe, A.D. and B.C. Osisoma, 2009. *Enterprises Management and Growth: In Practical Guide to Business Entrepreneurship*. edited by Osisoma B.C., Enugu E1 Demark Publishers.
7. Murphy, M., 1996. *Small Business Management*. London, Financial Times/Pitmas.
8. Onwuchekwa, C.I., 1992. *Management Theory and Organizational Analysis: A Contingency Theory Approval*. Enugu. Obu. Nig. Publishers.
9. Batty, G., 1974. *Entrepreneurship: Playing to Win*. Via. Restron Publishing Company.
10. Broom, H.N. and J.G. Longnecker, 1986. *Small Business Management*, Ohio, South Publishing Company.
11. Ile, N.M., 2001. *Small Business Management: An Integrated Approach*. Enugu, Otusm Nigeria Ltd.
12. Mehrad, M., H.G.A. Mohammad and R. Mahnaz, 2013. The Effect of Technological Innovation on Organizational Performance of construction industry. *Int. J. Rev. Life. Sci.*, 5(8) 29-35.
13. Mullin, L.J., 1999. *Management and Organizational Behaviour*, England, Pearson Educational Limited.
14. Onuoha, C.B., 1996. *Small Business Enterprises and Economic Development in Chima Onuohar and Udensi C.E. Ed. Government and Business Relations. The Nigerian Perceptive*, Enugu Precision Printers and Publishers.
15. Rimler G.W. and N.J. Humphrey, 1980. *Small Business*, New York; AmeCon.
16. Woodward, J., 1980. *Industrial Organization: Theory and Practice*, Oxford, University Press.