# TECHNOLOGICAL ENTREPRENEURSHIP AS PIVOTAL FOR SURVIVAL OF SMALL AND MEDIUM ENTERPRISES IN ABEOKUTA, NIGERIA

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**Abstract**
*Research has shown that technological entrepreneurship occupies the center of so many important debates everywhere in the globe as it is key and germane to the wealth of nations. Technological entrepreneurship is crucial to drive competitiveness in the business sector and assist growing ventures. Innovation and creativity are the major yardstick to measure the entrepreneurs strategies and growth models. Thus it becomes crucial to evaluate some of the significant ingredients that constitute technological innovation and creativity. Entrepreneurship is acknowledged to be a vital pointer to national wealth. The paper presents a quantitative framework for developing technological entrepreneurship particularly for a developing country like Nigeria, with some supporting recommendations. The argument is that technological entrepreneurship exploits existing systematic and technical knowledge to enhance competitiveness within the market place. The innovation process is being enhanced within the context of favorable policies, institutions, financial and institutional support.*
**Keywords:** Business models, entrepreneurship, new ventures, knowledge, technology

## Introduction

Technological entrepreneurship is an emerging field which has its base in the now established field of entrepreneurship. Its aim is to study the specificities of entrepreneurial activities in technology-intensive environments. Why is that important? Technology entrepreneurship puts together certain factors related with entrepreneuring and with other factors associated with entrepreneurial development. Technology ventures exploit breakthrough advances in science and engineering to develop better products and services for customers. The leaders of technology ventures demonstrate focus, passion and unrelenting will to succeed. Shane and Venkataraman (2004) defined technological entrepreneurship as the processes by which entrepreneurs assemble organizational resources and technical systems, and the strategies used by entrepreneurial firms to pursue opportunities.

Technological entrepreneurship, also referred to as technology-based entrepreneurship, can also be defined as the setting up of new enterprises by individuals or corporations to exploit technological innovation. It can also be described as the exploiting of technological discoveries or innovation. Technological entrepreneurship is defined as a style of business leadership that involves identifying high-potential, technology-intensive commercial opportunities, gathering resources such as talent and capital, and managing rapid growth and significant risk using principled decision-making skills. It is also defined as the process by which entrepreneurs assemble organizational resources and technical systems, and the strategies by entrepreneurial firms seek to pursue opportunities. For a technological entrepreneur to be relevant, he must of necessity meet market needs and be a problem solver. In a bid to meet market needs, research and development as well as science and technology efforts must be well coordinated.

According to Schumpeter, the weightiest function of entrepreneurs is to rectify or to renew the pattern of value procreation by exploiting inventions. The new economic context characterized by globalization, knowledge, increasing role of innovation in regional innovation systems and the importance of technological entrepreneurship as a factor in the wealth creation generate the emergence of new types of entrepreneurial ecosystems (Camagni, 1995; Feldman, 1994; Porter, 1990). The reason some regions are more advanced than others lies in successful use of new technologies and technological

entrepreneurship fostering. Siyanbola et. al, 2011 opined that technological entrepreneurship is needed to propel technological innovation efforts into the market. Whenever there is a breakthrough in research and development. It is the place of technological entrepreneurship to commercialize the achievements of technological efforts. Otherwise, it remains in the laboratory without making any impact. One of the reasons many research breakthroughs never leave the laboratory is due to short fall of technological entrepreneurs. And unless technological innovation or the output of research and development efforts reaches the market or are commercialized, industrialization would be elusive.

Technological entrepreneurship has the potential of improving the state of technological capability in a country. This is because as technological efforts are being made, learning takes place. This occurs either by doing or observation, thus improving technological capability in the efforts in question. Because technological entrepreneurship would necessarily involve the commercialization of a research output, more patents are generated and patents are a well-known indicator and measure of technological development and industrialization in countries all over the world.

Technological entrepreneurship is the platform that accelerates the diffusion of successful technological innovation in an economy. For instance in Nigeria, and in most African countries, the rate of diffusion of Information Communication Technology (ICT) is on the increase. This is made possible by the private firms that saw an opportunity and decided to market ICT products and services thereby increasing the pace of diffusion. The diffusion in turn has greatly enhanced the quality of life of the citizenries. Technological entrepreneurship brings in more novelty, innovations and Research and Development products on the markets. If technology is involved, entrepreneurship consists in bringing important changes into the traditional markets and new ones compared to the more traditional entrepreneurship. For an entrepreneur in the field of technology, opportunity recognition starts with the sensing of a need or a change and ends with innovative solutions in which future potential economic value is validated and recognized. The new venture will generate value if the founder will understand the entrepreneurial ecosystem. Information and knowledge should have been gathered in order to answer key issues regarding business model, new venture and markets. Technological entrepreneurship is a tool that facilitates affluence, wealth in individuals, firms, organizations, regions and nations. The study of technology entrepreneurship therefore serves as a germane and important role beyond satisfying intellectual curiosity. Technology entrepreneurs have to understand how their businesses will evolve and the importance of managerial skills, and most important strategic oriented mindset. The most important three motivational factors of the technological entrepreneurs are independence, opportunities exploitation and value generation (Oakley, 2003).. Similarly, a country's competitiveness as well as the economic performance of industry is determined by technological capability (Raghavendra and Bala Subrahmanya, 2006). The involvement of developing countries in producing new technologies and innovations is almost negligible (Juma and Agwara, 2006).By nurturing SMEs' (Juma and Agwara, 2006; Stefanovic et al., 2008) and especially technology-based SMEs (Kark, 2003) most countries have improved their economies and perhaps moved a step closer to development. Such countries include China, Korea and India. For instance India country made deliberate efforts to encourage entrepreneurship, education, training and research (Khanduja et al., 2008). Technology (based) businesses can be referred to as businesses that engage in technology related products, processes and services. They may be low, medium- or high-technology. One area of the economy which has seen significant growth is that focused on new technology-based products and services and the high technology sectors are perceived as major sources of future economic prosperity and employment growth (Cooper, 2006).

Techno-entrepreneurs aim at creating and capturing economic value through the exploration and exploitation of new technology-based solutions. To do so, they have to find their way in an existing world in order to (re)create a new one where they will be able to reap the benefit of their idea and vision. This process, which mainly belongs to opportunity recognition, raises an important issue about the ability to match current and future technologies, market needs and resources in a vision of a future business opportunity which is recognized as exciting by external actors. The ability to recognize business opportunities is one of the first and major skills an entrepreneur should acquire as it will dramatically shape the future of his venture. However, our understanding of this achievement remains vague and hardly actionable to support practitioners. Despite a thorough understanding of the opportunity recognition process, its determinants of success and failure, quite an

important lack of understanding remains as to appropriate anticipative approaches.

Actually, as in the managerial literature, the entrepreneurship literature assumes that entrepreneurs are able to anticipate and to build a credible vision of their future business. Mostly, two series of parameters explain these abilities: willingness to bear uncertainty and specific cognitive abilities starting with alertness. Techno-entrepreneurs would be more willing to bear uncertainty and more knowledgeable about overcoming this difficulty than non-entrepreneurs. Their alertness provides them with the ability to detect and exploit early signs of change and then to tell plausible stories about their future business. Besides, they know how to build precise plans according to detailed objectives, thus taking into account the potential impact of anticipated risks and problems. They formulate a plan for execution, that is to say a series of actions and events in order to capture the opportunity they have in mind. These tasks allow them to detect exciting future businesses and to motivate their potential partners so that they may gain access to the required resources to launch their business platform. Finally, opportunity recognition means both gathering knowledge and conceptualizing future business value. The way these tasks are achieved and combined is crucial to building trust, leveraging external resources and attracting a higher level of investment, of customers and of partners. However, so far, we do not know about the principles and procedures allowing us to gather knowledge about the future and to conceptualize the opportunity as it may concretize. That is why we propose to learn from three successful but different experiences of technological opportunity recognition and to analyze them as anticipation mechanisms.

The technological entrepreneur is an acknowledged key catalyst in the process of industrial formation and growth (Rothwell and Zegveld, 1982). There is usually more than one technological entrepreneur involved in the process of establishing a new technology-based firm. Usually technological entrepreneurs have different knowledge, skills and other characteristics than non-technological entrepreneurs. They have sufficient technical knowledge but they lack business skills necessary for success. Because technological entrepreneurs usually lack the necessary knowledge of entrepreneurship, all technical universities should also include some entrepreneurial courses. They should know (Dorf and Byers, 2005) that entrepreneurship education is a wonderful way to teach universal leadership skills, which include being comfortable with constant change, contributing to an innovative team and always demonstrating passion in their effort. From a personality perspective technical entrepreneurs are found to be more extrovert, more intuitive and more thinking-oriented than their less entrepreneurial engineering and scientific colleagues (Roberts, 1989).

Motivational factors of the technological entrepreneur are the key drivers of success and are slightly different from non-technological entrepreneurs. Three major motives (Oakey, 2003) for beginning a new business are ‘independence’, ‘wealth’ and ‘exploitation’. Most importantly, the desire for independence is divided into two sharply different, driving sub motives: ‘freedom’ and ‘control’. While the desire for freedom frequently derives from a need to escape the stifling bureaucracy of previous employment in large public or private sector bodies and pursue a personal (often research) agenda, the control motive is a more complex psychological driver. The availability of resources enabled by entrepreneurial networks greatly enhances the survival and growth potential of new firms (Liaoa and Velsch, 2003) and, because of that, especially entrepreneurial social networks (friends, relatives and acquaintances) are very important. Caamagni (1995) have defined a social network as the set of personal contacts through which an individual maintains his social identity and receives emotional support, material aid and services, information and new social contacts. There are some differences in networks of technological and non-technological entrepreneurs. Major candidates for high-technology entrepreneurship are scientifically qualified staff that have ‘spun off’, either from public sector research establishments (including universities) or existing (usually large) industrial firms (Freeman, 1982; Oakley, 2003), but we should not forget those who started their new technology-based firm on their individual research and development, not within the universities or existing companies.

Currently, technology-based entrepreneurship means that technology is at the core and origin of the new venture thanks to its potential to accomplish new performance through innovation. Many authors on entrepreneurship have recently paid attention to the concept of innovative opportunities (Freeman, 1982; Juma and Agwara, 2006; Raghavendra and Bala-Subrahmanya, 2006; Ardichvili et al., 2003). They agree on the fact that it is a social construct based on an initial idea and depending on individuals’ value, cognitive behaviors, knowledge, connections to the external environment and motivations. Introducing

technology in the scope of entrepreneurship brings in more novelty, new eventualities related to Research and Development power and assets as well as specific constraints and contexts. As soon as technology is involved, entrepreneurship consists in bringing important changes into the market compared to the more traditional entrepreneurship. Something new or significantly different has been created and exploited and its shape depends both on entrepreneurs' subjective thinking and on environmental conditions. Our position is typically to adopt the subjective creative approach to entrepreneurship.

**Statement of the problem**

Literature reports that success rates for new inventions ranged from 1% to 85%. From their observations, less than 2% of potential technology-based venture ideas (technology innovations) end up being registered as patent or intellectual property. Also less than 1% of business plans received by venture capitals get funded. In fact, many innovations that should have been commercialized into a technology-based venture end up in shelves. For instance, it was found that there is lack of faith in the Nigerian Patent Law, which in turn provided little protection for local innovations. Innovators consider this a major problem in the commercialization of their products and processes; 89% had not explored the use of the patent law, even though the law had been enforced since 1970 and 6644 patents have been registered with only 177 owned by Nigerians.(Siyanbola et al.,2011).

As many technological entrepreneurs know, there is a lot of pressure to move quickly and beat the competition to a solution. Technology changes and advances so quickly, and this sometimes causes small and medium enterprises to be unable to complete what they initially set out to do with their start up. Instead of accepting the failure of the business or changing directions, many small and medium enterprises simply let their operations lie stagnant.

**Literature review**

**Innovation**

Innovation is at the heart of the entrepreneurial spirit (Khanduja et al, 2008). Copper (2006) define innovation as "the introduction of a new product, process, technology, system, technique, resource or capability to the firm or its markets." This is conceptualized as new products or processes that significantly improve customer benefit and technological delivery over existing products (Chandy and Tellis, 2000). Ardichvili et al (2003) considers innovation as a process which "goes beyond the limits of technologies to address the larger scope of change in general. Innovation can indeed deal with the technological side of human activities, thus with product design and manufacturing processes, but it may also deal with the organizational and social side, e.g., external interactions with suppliers, clients or partners, internal processes which became routines in the way the firm operate." In this case, we shall pay particular attention to external interactions and organizational and social effects.

**Technology**

The term technology as a basic unit of technology management is controversially discussed in literature. This paper closely follows Tschirky's(2003) definition: "Technology constitutes specific knowledge, abilities, methods and equipment, facilitating deployment of scientific and engineering knowledge". In order to remain competitive, companies are managing technologies with four purposes:

• To enable the development of new products and services

• To allow and improve performance of specific product functions

• To serve manufacturing

• To produce products and finally to ensure companies' administrative processes and infrastructure

The total of a company's deployed technology represents the technology potential being subjected to technology management. Within the scope of technology management, the term technology has two fundamentally different forms (Tschirky, 2003): Product technologies are those that deploy scientific or Engineering principles to assure a specific technological impact, e.g. from optics, electronics, Nuclearphysics, aerodynamics. Process technologies however, deploy the effects of existing product technologies to enable and or optimize the occurrence of the technological impact. R&D process technologies are used to perform R&D activities and may include technologies such as microscopy, nanotechnology and atomic absorption technology. Typical production process technologies include galvanizing, soldering and surface mounted technology (SMT).

A technology-based firm can be conceived of as an organization which transforms input (such as components, products and services) from suppliers and partners into output (such as products, systems and services) to customers and partners. To enable this transformation, the firm has to dispose of certain assets, such as competencies and equipment. The combination and use of these assets allow competitiveness to be built up and sustained in the market place. Under this aspect the enterprise can be viewed as an entity containing a number of specific and mostly overlapping competencies whose activation occurs by means of performing distinct processes. An enterprise finally is existentially dependent on the integration of this into its environment (Tschirky, 2003).

**Technology capability**

Technological capability is the ability to create new technologies and to develop new products, processes or new industries in response to changing economic environment (Roberts, 1989). Technological capability is a specific collection of equipment, skills, knowledge, aptitudes, and attitudes that confer the ability of a firm to operate, understand, change and create production processes and product (Marcelle, 2004). The advancement in the level of technical know-how and widespread application of technological innovations resulting in high productive capability and economic growth is not new in developed nations. For developing countries that are on the path to technological and economic catch-up, strengthening such technological capability and innovations are their pursuits (Adeoti and Adeoti, 2010). This is because acquiring advanced knowledge and technologies have no value if the acquiring nation doesn't possess the necessary technological capabilities that can allow such nations to seize such technological opportunities for promoting innovations (Tschiry.,2003; Kark, 2003). Building local technological capability therefore, is a necessary condition for any nation aspiring to develop technologically (Adeoti, 2002).

According to Lall (1992) technology capability is a continuous process to create or absorb technological knowledge from the interaction with the environment and the accumulation of skills and knowledge acquired by the firm. However, the simple fact of buying technology does not mean that the firm is acquiring technological capability (Chandy and Tellis, 2000). Firms need, in fact, to accumulate resources and competencies which allow them to have a more developed technological capability than their competitors. In that sense, the technological capability relates to the absorption and transformation of a technology as a way of reaching higher levels of technical-economic efficiency (Oakley, 2003; Dorf and Byers, 2005 ;Kark, 2003; Rohwell and Zegveld, 1982; Siyanbola et al, 2011).

Many authors link the technological capability to the knowledge of the firm (Panda and Ramanathan, 1996; Mumullen and Shepherd, 2006 ; Chandy and Tellis, 2000; Tschirky, 2003 ). For Marcelle (2004), firms develop their technological capability in an incremental way, and in doing that, they are limited to continue to do what they already know, which means there is a cognitive limit to what the firm is capable of doing. Lall (1992) however, say that firms from emerging countries, after they import technologies, go through a learning process which eventually enable them to develop their own technologies. So for them, the concept of technological capability embraces the generation of the new knowledge.

**Technology entrepreneurship**

Having discussed the two relevant fields of study, entrepreneurship and innovation, this section presents the emerging terms, 'technology entrepreneur' and 'technology entrepreneurship'. These terms are increasingly significant in today's globalized era where technological innovation is given high priority. The increasing degree of competitiveness, particularly in technology intensive industries, requires the recognition of a distinct type of entrepreneur, namely the 'technology entrepreneur'.Aderemi et al. (2011) positioned technological entrepreneurship as being needed to make full use of the knowledge of science and technology currently available in meeting market needs, thereby making the country in question more productive and more competitive internationally. This suggests the necessary involvement of a process of industrial innovation in the country's area of strength and endowment to generate productivity and competitiveness. According to them, Technological entrepreneurship is initiated and culminated in design, development, production, engineering, commercialization of innovative new products and processes.

**Technology entrepreneurial process**

Bulsara et al (2010) and Ajagbe and Ismail (2014) emphasize that in trying to understand the differences and similarities between a conventional and technology entrepreneur, it would be useful to understand the entrepreneurial process both have to

undergo. They enumerated however that technology entrepreneurial process involves seven stages of the entrepreneurial life cycle.

**Characteristics of a technology entrepreneur**

Bulsara et al. (2010) elucidates on two options open to technology entrepreneurs to commercialize their patented technology, and suggests that an innovator who does not possess an enterprising tendency or entrepreneurial characteristics should opt for technology transfer (licensing). These authors add that someone who has a strong entrepreneurial characteristics and enterprising tendency would also be most suited for techno-entrepreneurship. In addition to this, they explained that the basic characteristics that would be expected of a technology entrepreneur to be successful include: need for achievement, need for autonomy and independence, creative tendency, moderate and calculated risk taking, drive and determination.

**Methodology**

Both qualitative and quantitative research design was employed. The research design for this study took the form of a descriptive survey.( Mugenda and Mugenda (2003) . Survey method allows for generalization of findings but it is also descriptive in nature which suites the purpose of this study. The population includes a representative sample of small scale industries drawn from various parts of Abeokuta. Data was collected using a structured questionnaire. Descriptive statistics was implemented in order to investigate the demographic data, one-way analysis of variance (ANOVA) was used to determine whether any significant relationships exist among respondents. In addition, the .05 level of statistical significance was set at all statistical tests in the present study.

**Data analysis and discussion**

Table 1: Questionnaire respondents

| Questionnaire | Respondents | Percentage(%) |
|---|---|---|
| Returned | 105 | 96.3% |
| Not Returned | 4 | 3.7% |
| Total Distributed | 109 | 100 |

Field Survey, 2018

A total of one hundred and nine (109) questionnaires were produced and administrated to the sampled categories of respondents. At the end of the study one hundred and five (105) questionnaires were returned, coded and analyzed giving a response rate of 96%. This response rate was excellent and conformed to Mugenda and Mugenda (2003) argument that for generalization of findings to the whole population the least acceptable response rate should be 50%. A response rate of above 70% is excellent.

Test of hypotheses

Hypothesis 1: There is positive relationship between technology and productivity in small and medium scale enterprises

Table 2a Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .323[a] | .104 | .068 | .73635 |

Table 2b ANOVA[a]

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 6.313 | 4 | 1.578 | 2.911 | .025[b] |
| | Residual | 54.221 | 100 | .542 | | |
| | Total | 60.533 | 104 | | | |

Dependent Variable: Technology takes small and medium enterprises to the next stage of business growth

The results from model summary table above revealed that the extent to which technology affects productivity in small and medium enterprises is 10.4% i.e. (R square = 0.104). The ANOVA table shows that the fcal is 29.11 at 0.000 significance level. The table shows that technology is positively associated with productivity in small and medium enterprises.

Table 2c Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.739 | .293 | | 9.348 | .000 |
| | The main aim of entrepreneurship development programmes is to encourage setting up of small business that are technology intensive | -.187 | .072 | -.257 | -2.605 | .011 |
| | Most technology intensive small businesses are empowered and supported by Technological entrepreneurship development programmes | -.164 | .088 | -.178 | -1.869 | .065 |
| | Information provided by Technological entrepreneurship development programmes help small business to adopt technological input | -.047 | .093 | -.051 | -.504 | .616 |
| | Integrating small business operation and technological innovation had been made possible by Technological entrepreneurship development programmes | -.029 | .090 | -.032 | -.326 | .745 |

a. Dependent Variable: Technology takes small and medium enterprises to the next stage of business growth

The coefficient table above shows the simple model that expresses how technology positively affects the productivity of SMEs. The model is shown mathematically as follows:

Y=a+Bx where y is technology and X is SME business productivity, a is the constant factor and b is the value of the coefficient.

The above result implies that technology has a positive significant relationship on business productivity i.e. since P value 0.001 is less than 0.05. There is a positive association between technology and productivity.

Hypothesis 2: Technology entrepreneurship influences the survival rate of small and medium enterprises.

Table 3a Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .119[a] | .014 | .005 | .62063 |

a. Predictors: (Constant), Technology exposes entrepreneurs to attractive business opportunities leading to growth and survival

Table 3b ANOVA[a]

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .574 | 1 | .574 | 1.491 | .225[b] |
| | Residual | 39.673 | 103 | .385 | | |
| | Total | 40.248 | 104 | | | |

a. Dependent Variable: Technology entrepreneurs are able to adopt innovation which increases survival rate

b. Predictors: (Constant), Technology exposes entrepreneurs to attractive business opportunities leading to growth and survival

Table 3c Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.335 | .144 | | 9.246 | .000 |
| | Technology exposes entrepreneurs to attractive business opportunities leading to growth and survival | .099 | .081 | .119 | 1.221 | .225 |

a. Dependent Variable: Technology entrepreneurs are able to adopt innovation which increases survival rate

The coefficient table above shows that the simple model that expresses how technology positively affects the survival of SMEs. The model is shown mathematically as follows:

Y=a+Bx where y is technology and X is SME business survival, a is the constant factor and b is the value of the coefficient. From this table therefore, customer satisfaction= 1.335 + 0.099 business survival.

Therefore, for every 100% increase in technology, business survival effect is 9.9%.

The above result implies that technology is positively associated with business survival i.e. since P value 0.00 is less than 0.05. There is a significant relationship between technology and business survival. Also, technology is positively associated with business survival.

The results from model summary table above revealed that the extent to which technology influences the survival rate in small and medium enterprises national is 0.14% i.e. (R square = 0.014). The ANOVA table shows that the fcal is 1.491 at 0.000 significance level. The table shows that business survival has a significant relationship with technological entrepreneurship.

Hypothesis 3: Technological entrepreneurship development programmes affect small business operation

Table 4a Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .161[a] | .026 | .017 | .94997 |

a. Predictors: (Constant), Technological entrepreneurship development programmes does impact skills required for small business to operate

Table 4b ANOVA[a]

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2.478 | 1 | 2.478 | 2.745 | .101[b] |
| | Residual | 92.951 | 103 | .902 | | |
| | Total | 95.429 | 104 | | | |

a. Dependent Variable: Technological entrepreneurship development programmes has helped to stabilize business growth and operation

b. Predictors: (Constant), Technological entrepreneurship development programmes does impact skills required for small business to operate

Table 4c Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.413 | .204 | | 6.919 | .000 |
| | Technological entrepreneurship development programmes does impact skills required for small business to operate | .168 | .102 | .161 | 1.657 | .101 |

a. Dependent Variable: Technological entrepreneurship development programmes has helped to stabilize business growth and operation

The coefficient table above shows that the simple model that expresses how technology entrepreneurship development programmes affects the small business oprations. The model is shown mathematically as follows:

Y=a+Bx where y is technology entrepreneurship development programmes and X is small business operation, a is the constant factor and b is the value of the coefficient. From this table therefore, customer satisfaction= 1.413 + 0.168 business survival. Therefore, for every 100% increase in technology, business survival effect is 16.8%.

The above result implies that technology entrepreneurship development programmes is positive associated with small business operation i.e. since P value 0.00 is less than 0.05. The decision would be to reject the null hypothesis (Ho) and accept H1, i.e. that technology entrepreneurship development programmes is positive associated with small business operation.

**Findings**

1. The results from model summary table above revealed that the extent to which technology affects productivity in small and medium enterprises is 10.4% i.e. (R square = 0.104). The ANOVA table shows that the fcal is 29.11 at 0.000 significance level. Hence the null hypothesis that there is no significance between technology and productivity in small and medium enterprises is rejected and the alternative hypothesis is accepted.

2. The above result implies that technology has a positive significant relationship on business survival i.e. since P value 0.001 is less than 0.05. Hence the null hypothesis that there is no significance between technology and survival in small and medium enterprises is rejected and the alternative hypothesis is accepted.

3. The above result implies that technology entrepreneurship development programmes

is positive associated with small business operation i.e. since P value 0.00 is less than 0.05.

Hence the null hypothesis that there is no significance between technology entrepreneurship development programmes and small business operation is rejected and the alternative hypothesis is accepted.

**Conclusion**

Based on the foregoing results, technology is very important in ensuring the survival of small and medium enterprises because they improve productivity, bring about competitive advantage over competitors and also enhance business operation. It is high time that small and medium enterprises realize that technology is needed in their activities in order to ensure continued survival in the business environment. It is also pertinent that small and medium scale enterprises incorporate the use of technology in their day to day activities.

**Recommendations**

Based on the findings of this research work, it then becomes pertinent to put some important recommendations that will help the incorporation of technology in small and medium scale business operations. These include;

1. More sensitization should be made by Technological Entrepreneurship Development Programmes on the importance of technology in the survival of small and medium scale enterprises.

2. Small and medium scale enterprises in conjunction with financial institutions should ensure that entrepreneurs have access to adequate finances that would be useful in incorporating Technology with small business operation as it has been observed that most technological equipment come at a higher cost.

3. The federal should as a matter of urgency assist prospective entrepreneurs in the provision of basic amenities which would and assist entrepreneurs, most especially technology entrepreneur in their day to day activities. These amenities range from electricity as most of technological equipment and appliances require the use of electricity in their operations.

**References**


Adeoti, S. and Adeoti, A. (2010). *The Development of Entrepreneurship in Malaysia: State-led Initiatives. Asian Journal of Technology Innovation. 16 (1). 101-116*

Adeoti, S. (2002). *Technology: A Key Strategic Resource. Management Review. 78(2). 37-41*

Ardichvili, K. Ahmad, B. and Zaki, S. (2003). *Technopreneurship as the New Paradigm for EBusiness. Malaysia: University of Technology Malaysia*.

Aderemi, H. ,Oscar, S. and Stephen, S. (2011). *Comparative Analysis of Women Entrepreneurs in Technological and Non-Technological Industries in Southwestern Nigeria; Unpublished MSc Thesis Submitted to TechnologyPlanning and Development Unit(TPDU), Faculty of Technology, ObafemiAwolowoUniversity,Ile-Ife, Nigeria*.

Camagni, R. P. (1995). The concept of innovative milieu and its relevance for public policies in European lagging regions, *Papers in regional Science, 74, 317-400*

Chandy, A.D. and Tellis, F. (2000). Recent Developments in American Business Administration.*Business History Review. 35. 25-28*

Cooper, S. (2006). Knowledge and expertise for high-technology entrepreneurship: a tale of two sectors. *Int. J. Knowl. Manag. Stud. 1 (1-2): 59-78*

Dorf, R.C. and Byers, T.H.(2005) *"Technology Ventures: From Idea to Enterprise,"* 2nd Edition, McGraw Hill, New York, 2007.

Feldman, T.F. (1994). General Purpose Technologies: Engines of Growth?' *In Magnusson, Lars (ed). Evolutionary and Neo-Schumpeterian Approaches to Economics.* Boston: Kluwer Academic Publishers.

Freeman, C. (1982). A Study of Success and Failure in Industrial Innovation (SAPPHO) Science and Policy Research Unit, University of Sussex. London: Centre for the Study of Industrial Innovation.

Juma, C. and Agwara, C. (2006). The Diffusion of Technical Innovation and Changes of

Technoeconomic Paradigm. Paper presented at Venice Conference on Innovation Diffusion, March 17-21, 1986.

Kark, R.P., (2003). Innovation and the management of marketing in high technology small firms. *Journal of Marketing Management 7, 343–356.*

Khanduja, P., Cooper, S.Y., and Anney, K.( 2008). High technology industry, agglomeration, and the potential for peripherally sited small firms. *Regional Studies 23 (4), 347–359*

Lall, S. (1992). *Building Industrial Competitiveness in Developing Countries.* Paris: OECD.

*Liaoa, L. and Velsch, M. (2003). Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data.* Paris: OECD.

Marcelle,B. (2004). *Framework for Technological Entrepreneurship Development: Key Issues and Policy Directions*

Mugenda, S. and Mugenda, K.(2003)"An Assessment of the Choice and Performance of Women Entrepreneurs in Technological and Non-Technological Enterprises in Southwestern Nigeria," *African Journal of Business Management, Vol. 2, No. 10, October 2008, pp. 165-176.*

Mcmullen, J. A and Sheperd, N.. (2006). *Capitalism, Socialism and Democracy, New York, Harper and Row*

Panda, B. and , Ramanathan, MO (1996).An appraisal of technological entrepreneurship development programmes on the performance of selected SMES in Lagos- Nigeria. *Issues Bus. Manag.Econ. 1(8):208-217.*

Porter, M. (1990). The Supply of Entrepreneurship and Economic Development. In Burnett, D. *Technopreneurial.com: History of Entrepreneurship Theory.*

Ragharendra, R. and Bala-Subrahmanya, M. (2006).Venture capital and high technology entrepreneurship. *Journal of Business Venturing, 3(4), 301–319*

Roberts, R.K. (1989). Student perspectives on entrepreneurship: observations on their propensity for entrepreneurial behavior. *International Journal of Innovation Management 2(415), 308–322.*

Rothwell, R., Zegveld, W., (1982). *Innovation in the Small and Medium Sized Firm.* Frances Pinter, London.

Shane, S. and Venkataraman, S. (2004): Guest editor's introduction to the special issue on technology entrepreneurship.*Research Policy, 32(2):181-184.*

Siyanbola, R.A., Maidique, Modesto A. and Steven C. Wheelwright (2011). *Strategic Management of Technology and Innovation.*

Stefanovic, C. , Coppoer, L. and Sheider, N.(2008). The Economics of Technical Change. In Archibugi, D. and Michie, J. (eds), *Trade, Growth and Technical Change.* Cambridge, MA: Cambridge University Press.

Tschirky, E (2003). Perspectives: Entrepreneurship Development & Growth of Enterprises in Nigeria; *Entrepreneurial Practice Review* Volume 2 Issue 2 Winter2012