



GLOBAL JOURNAL OF RESEARCHES IN ENGINEERING: F
ELECTRICAL AND ELECTRONICS ENGINEERING

Volume 17 Issue 7 Version 1.0 Year 2017

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals Inc. (USA)

Online ISSN: 2249-4596 & Print ISSN: 0975-5861

Technopreneurship: A View of Technology, Innovations and Entrepreneurship

By Fowosire, R. A, Idris, O.Y & Opoola Elijah

Abraham Adesanya Polytechnic

Abstract- There is a strong connection between Technological development, Innovations and entrepreneurship. It is noteworthy that, entrepreneurship forms the sub structure upon which science and technology are built. As we understand it, technopreneurship is, by a large part, still entrepreneurship. The difference is that technopreneurship is either involved in delivering an innovative hi-tech product (e.g. Microsoft) or makes use of hi-tech in an innovative way to deliver its product to the consumer (e.g. eBay), or both (e.g. most pharmaceutical companies). Technopreneurship is not a product but a process of synthesis in engineering the future of a person, an organization, a nation and the world. Strategic directions or decision-making processes are becoming more demanding and complex. This requires universities, and in site professional development programs and training to produce strategic thinkers who will have skills to succeed in a rapidly changing global environment.

Keywords: *technopreneurship, technology, innovations, entrepreneurship, creativity, SME, commercialization.*

GJRE-F Classification: *FOR Code: 290903*



Strictly as per the compliance and regulations of:



Technopreneurship: A View of Technology, Innovations and Entrepreneurship

Fowosire, R. A^α, Idris, O.Y^σ & Opoola Elijah^ρ

Abstract- There is a strong connection between Technological development, Innovations and entrepreneurship. It is noteworthy that, entrepreneurship forms the sub structure upon which science and technology are built. As we understand it, technopreneurship is, by a large part, still entrepreneurship. The difference is that technopreneurship is either involved in delivering an innovative hi-tech product (e.g. Microsoft) or makes use of hi-tech in an innovative way to deliver its product to the consumer (e.g. eBay), or both (e.g. most pharmaceutical companies). Technopreneurship is not a product but a process of synthesis in engineering the future of a person, an organization, a nation and the world. Strategic directions or decision-making processes are becoming more demanding and complex. This requires universities, and in site professional development programs and training to produce strategic thinkers who will have skills to succeed in a rapidly changing global environment. This paper has brought to the fore the need for countries to put forward, realize and promote technopreneurship as a way of technological advancement in the modern age, as it asserts that entrepreneurship must be the sole base of innovation in the world of science and technology; only then can technological innovations be valuable to the pursuit of economic development. While the strength and growth of any economy is facilitated by the civil entrepreneurial culture and the versatility of its technical know-how, this paper focus on the relevance of adopting technopreneurship as a way of societal development, thus establishing the inter-relationship between the scientist, engineers and the business sector with aim of enhancing proficiency in research and development.

Keywords: *technopreneurship, technology, innovations, entrepreneurship, creativity, SME, commercialization.*

I. INTRODUCTION

In this world of accelerating economic globalization, advances in science and technology continue in the blink of an eye, and knowledge is recognized as a core competence in accumulating wealth (Lalkaka, 2002). The latter half of the 20th century has seen science and technology compliment land, labor, and capital as sources of wealth (Etzkowitz, 2003a). Correspondingly, knowledge and innovation have come to be recognized as factors of production (O'Shea, Allen, Morse, O'Gorman, & Roche, 2007). The art of entrepreneurship has the potential to ignite knowledge and innovation within the IT industry. In this environment, then, the

question becomes how best to harness and capitalize on knowledge and innovation. With the advent of the internet, the information age has become an opportunistic environment for entrepreneurs. The rapid evolution of technology in the last fifty years plays a significant role in our day to day lives. Information Technology (IT) builds and supports the processes of organizations on a competitive global platform. The shift from the physical world to the virtual world is also a noticeable trend as an increasing number of everyday functions and processes are shifting to an electronic realm. Traditionally, IT entrepreneurship has been most successful and lucrative in most parts of the world. Around the world, we can see that nations have embraced information and communication technology (ICT) as a means to enrich public and private sector processes, while providing citizens with easier access to these services (Fang, 2002). The emergence of technological innovations has opened up to new opportunities and challenges to a nation's economic development (Yunos, 2002). It is worth to mention that information technology has becoming an important fact to the business community as it helps improve the business processes.

The term "technopreneurs" means technology entrepreneurs, which are basically the big, small and medium enterprise ICT and multimedia companies. Focusing on these various enterprises, advancements in ICT and technological adoption will provide channel to accelerate and expand businesses as well as its people, which bears vital importance to the growth and development of entrepreneurs in the knowledge-based economy. Besides daily advancements to better structures and strategies are being explored and developed to help technology-based enterprise grow especially the small and medium ones offering a promising future within the global marketplace, thereby being able to expand themselves to compete in this borderless world, at the same time create, and add value to their business in order to achieve sustainability.

a) Nigeria's Experience

The history and development of technopreneurship in Nigeria is linked to the entrepreneurship development process. Prior to 1970 the role of government was not significant till 1986 after the introduction of Structural Adjustment Program (SAP) which was subsequently followed by the establishment

Author α σ ρ: Dept. of Electrical & Electronics Engineering School of Engineering Technology Abraham Adesanya Polytechnic, Ijebu Igbo, Ogun State, Nigeria. e-mail: remifowosire@yahoo.co.uk

of the Small Scale Industries Credit Guarantee Scheme (SSICS), National Directorate of Employment (NDE), National Open Apprenticeship Scheme (NOAS), Small and Medium Enterprise Development Agency of Nigeria (SMEDAN), as well as Centre for Entrepreneurship Development (CED), National Centre for Technology Incubation (NCTI). The process received a major boost with the introduction of privatization and commercialization decrees in 1988 - 1995 resulting in the emergence of business enterprises in the fields of agriculture, manufacturing, banking, mining, education, publishing, and information & communication technology. This development provided the fertile ground needed for the emergence of micro, small and medium enterprises that are engaged in the production and provision of auxiliary products and services. The role of Government became much more apparent through the activities of SMEDAN by supporting and supervising entrepreneurship units while the Central bank of Nigeria provides financial assistance to entrepreneurs through the 10% fund contribution by commercial banks to the Small and Medium Enterprise Equity Investment Scheme (SMEEIS). As noted by Babajide, "the scheme aimed at assisting the establishment of new, viable small and medium industries; thereby stimulating economic growth, and development of local technology, promoting indigenous entrepreneurship and generating employment".

II. LITERATURE REVIEW

The emergence of technology and the innovations it brought has opened up new opportunities and challenges into businesses in this regard, technological adoption and advancement act as channel to expand and accelerate the businesses as well as the people. Lalkaka (2002) defined technological innovation as the process that drives a concept towards a marketable product or service. This holds true as it contributes towards raising productivity and competitiveness (Lalkaka, 2002).

Technopreneurship is innovative application of technical science and knowledge individually or by a group of persons, who create and manage a business and take it financial risk in order to achieve their goals and perspectives. The engineers possess high technical skills in this regard but they often enjoy few skills in business and in terms of entrepreneurial thinking (Prodan, 2007). Technopreneurship is one of the basic foundation areas of the ICT age in entrepreneurship that plays important role in creation of competitive advantage in various enterprises and organizations, reconstruction and economic growth being basic reasons for this, businesses will be able to expand themselves to compete in this ever expanding world, at the same time create and add value to them (businesses) in order to achieve sustainability.

Today, it is completely clear that according to a report from OECD, development of technology play an essential role in economic growth and development and technology oriented industries may play ever-increasing and major role in international trade. While emerging technopreneurship may cause ever-growing appearance of knowledge based SMEs (Dahlstrand, 2007). Technopreneurship as a leadership style of business including identifying extremely technological economic opportunities with high capacity for growth, collection of resources like expert manpower and capital, rapid growth and remarkable risk management by means of decision making skills (Dorf, R.C., & Byers 2005). The rapid advancement of technology has encouraged small and medium-sized businesses (SMEs) to utilize the opportunity to establish, expand, as well as prosper their businesses capable of generating employment opportunities, mobilizing the local resources, creating a balanced and affluent society and playing a significant complementary role to large firms and eventually strengthening the economic development of the nation as a whole (APEC, 2001)

III. DEFINITION OF TECHNOPRENEURSHIP

Technopreneurship is a latent concept that is placed in the core of many fundamental subjects. Various literatures use the term "technology-based entrepreneurs", "technical entrepreneurs", "high technology entrepreneurs" or even "high tech new ventures" to describe new business that combine entrepreneurial skills and technology (Florida and Kenney, 1988; Dahlstr and Lindholm, 1999; Renko, Autio and Tontti, 2002 ; Oakey, 2003; Kakati, 2003) Technopreneurship comprises of identifying modern technologies and even creation of technological opportunities by presentation of commercial products and services (Blanco, 2007). Technology -based entrepreneur is a process and formation of a new business that involves technology and these "technopreneurs" use technological innovations and translate such technology into successful products or services. Technopreneurship is the process of investing in a project which gathers and activate expert members with different assets, which relates to advancement in scientific and technological knowledge, in order to create and acquire value for a specific enterprise, the social context in which the entrepreneur operates also plays an important role in nurturing this concept, one of such ways is through embeddedness, where entrepreneurs are being embedded within the confined structure in the area in which they operate. Objective of technopreneurship is commercialization of innovations developed by academic scientists via patenting, licensing, start-up creation, and university-industry partnerships

(Grimaldi et al., 2011). Entrepreneurs who are into the core businesses involving technology - based industries and make use of technology to come out with new or innovative products through a process of commercialization are technopreneurs. Their businesses are generally marked with high growth potential and high leverage of knowledge and intellectual property. Potential Technopreneurs must be equipped with both technical and business skills. Generally, technopreneurs possess high technological knowledge deprived from relevant skills of business (i.e. financial experiences and data), and achievement in technological enterprises. Techniques and technology are deemed as some part of innovation. Technopreneurship process is mainly related to technological innovations, where technology may be utilized as a system of theoretical and operational knowledge and skills by enterprises for development, production, and delivery of their products and services so that it could be defined and embodied in personnel, materials, facilities, equipment, and physical procedures and processes. In general from their viewpoint, technopreneurs possess a lot of technical knowledge but they lack of entrepreneurial necessary skills for management, duration, and success in organizations and this has led to reduced efficiency in technology base organizations and enterprises (Antonici & Prodan, 2007). Technopreneurship will be placed in the development path when the relationship among micro and macro factors is being addressed between technological opportunities and entrepreneurial performance. In a study conducted by Petti and Zhang (2011), corporate technopreneurship is included in a system of internal entrepreneurial processes and the related strategic capabilities respectively including identifying, discovering, and creation of technological opportunities and development of values that enable innovative business models to exploit from these opportunities. More clearly, it is to search for opportunities and budgeting for investment and covers entrepreneurial tendency. Knowledge management covers capacity for attraction and manages the relevant change to innovation of business model and incorporates dynamic capability that is aimed at creation of competitive advantage in organizational environment.

The suggestion that there is a strong and positive correlation between technopreneurship and the growth of enterprises has certainly been discussed in literature since the early works on entrepreneurship and economic development by Schumpeter. It is widely accepted that an increase in the number of technopreneurs leads to an increase in enterprise growth which is also a direct result of their skills, and their tendency to innovate. Their ability to generate enterprise growth in a particular economy is normally manifested in their innovative capability, as described by introducing new goods and services

which are not familiar to consumers, new quality, new method of production, opening of a new market, and capture of a new source of supply of raw materials or other inputs. The obvious ability and willingness of entrepreneurs (who anchor their business thrust on technology) to practically perceive and create new business opportunities and decide to venture in to such opportunities in spite of the challenges of market uncertainties and other impediments, affect and ultimately renew the business activities, not only within their business units and industries, but also within the economy they are situated. The culmination of various technopreneurial initiatives with the occurrence of a variable with a differing role in an aggregated form could result in general enterprises growth which, to a greater extent, can be measured in terms increase in competitiveness, market share, quality, profitability, and innovation gained by the business units. The influence of this is normally driven by their activities in provision of a wide range of services. Investment-generated innovative services are associated with lower transaction costs and, therefore, greater efficiency, competitiveness, market growth as well as increased earnings. Consequently, absences of funds yield little room for opportunities in terms of increased innovative activities. Expectedly, given the abundant natural resource and cheap labour in Nigeria, the technopreneurs will be able to help build a significant cluster of viable ideas and business schemes in order to develop a number of excellent enterprises in Nigeria. The technopreneurs will be able to manifest characteristics such as product and process innovativeness, high growth rate, technology adoption, and high market growth rate. This could contribute significantly to the business as well as economic growth through value addition, wealth creation and job opportunities. Therefore there is strong positive relationship between innovative services, technopreneurship and enterprise, also the growth of technopreneurship drive and SMEs significantly depend on the availability and accessibility innovative services. Innovative entrepreneurship is becoming the corners tone of economic growth in the developed and developing world. Government and the industry can create the plat forms that tap in to people's creativity in what ever way it is expressed, rather than regarding innovation as the domain of asm allh and ful of people. Industries in the developed world spend huge sumannually on research and development, with the eye to fostering innovation and aculture of risk and reward (Cukier, 2006).

a) *Competition and Progress in the Technopreneurs' world*

Competition is the process of trying to do better than others. In the world today, people and organizations face a common global problem which is

the need to improve in performance so as to adapt to the fast paced global changes. People and organization who deliberately innovate, or make continuous changes in their products and processes, has a huge gap in the world of information and communication technology. The basic key to maintaining competitiveness lies in the ability to change and improve what we do and how we do it. According to Paul Mott-University of Pennsylvania, in the world of competition, an effective organization, institutions etc. displays three characteristic simultaneously (Molt, 1972). The seare:

Efficiency: This is the optimal use of services to create a well structural, stable, routine in product in high quantities, quality and at low cost. In this world of advance technology, efficiency alone is not enough to meet the global market (Molt, 1972).

Adaptability: A daptability means mastering; Innovation is the key to Adaptability. It requires looking for new technologies, ideas and methods that may improve or completely change a process routine to match the demands of the technological world. Adaptability also involves processes based on knowledge acquired from an earlier work done. Adaptability helps you not just to reproduce but to improve on an existing model so as to meet the demand of clients. This means that as technopreneurs, we must not just study the technology of product and services but we must study the market so as to adapt the innovation to meet the market demand. In other words we must main stream innovation (Molt, 1972).

Flexibility: This is the ability of an organization to react to unexpected emergencies quickly while still maintaining its routine. It's not enough to rely solely on flexibility in order to cope with change, anticipating a change by "leapfrogging" bringing to the market goods and services that meet the needs of the consumer to them even before the consumer envisage the change.

SME have unique characteristics and due to these characteristics, it is conclusive to say they have inherent capabilities to undertake technological innovations successfully across specialized field and economy. As there is adequate empirical evidence to shed light on SME innovation and its contributions in the context of developed countries, in light of this, there is hardly any proof of evidence showing innovative SMEs are rapidly industrializing economies like Nigeria. This paper takes into consideration deep rooted findings of two empirical "Innovation Projects" implemented in Lagos based on the last few years, specifically the Ikeja and Victoria-island regions. In today's economy, SMEs are largely incremental innovators, due to the effects of their customers and their involvement in the said products and/or process innovations. Majority of these SME's carried out their innovations with internal efforts only, only a few/minority obtained external support to carry out its innovations,

the latter had better technical strength and frequent analysis on outcomes for both product & process innovations. Such SMEs achieved better innovation performance as well as better economic performance.

The Economy grows better innovation performance as well as better economic performance rapidly if entrepreneurs make remarkable progress in various industries like Manufacturing, Precision Engineering Design, Food Processing, Pharmaceutical, Textile & Garments, Retail, IT and ITES, Agro and Service sector and can be achieved with the following:

- (i) Innovations: How creative is the product
- (ii) Quality of innovations: How valuable standard is the product
- (iii) Patenting culture: How to protect and secure that Standard.

The elements of creativity are sometimes generalized as cognitive, affective, personal and motivational, and social or environmental. Among these, cognitive and affective elements are arguably most important. The cognitive aspects of creativity include basic knowledge (both general and field-specific), perceptiveness, originality, attraction to complexity (e.g., combining, analyzing, and applying different, disparate ideas or concepts), open-mindedness (e.g., resistance to closure, and awareness of creativity. Affective elements include curiosity, humor, independence, and risk-taking.

IV. CHALLENGES TO TECHNOPRENEUR

In the new age of IT, great exploits in innovations research and development hasn't been without its negatives and disadvantage. These hindering factors include: government policy, human capacity development, lack of facilities, and lack of standard for confirmation, capital, market and energy. Research innovation is generally not appreciated, so less investment would lead to less development breakthrough in products. Instead of being trend setters, they choose the easier option which is to follow trends.

V. ROLE OF GOVERNMENT

Government roles in supporting technopreneurship comes in various forms directly and indirectly, indirectly by enacting favorable regulation and public policies for creating conducive economic system for technopreneurship to grow and directly by providing risk capital. Venkataraman (2004) clearly believed that some kind of intervention was necessary for encouraging technopreneurship. However, if government attempted to provide the intangible infrastructure, an entitlement mentality would emerge. On the other hand, markets or private institutions have not always solved problems effectively and efficiently. Both independent on each other would crash.

The governments basically promote technopreneurship by injecting risk capital; this alone does not provide encouraging results. It should be noted that massive interventions may increase dependency of technopreneurship to government aids, which cannot be sustainable in the long term. Government intervention should be comprehensively analyzed and carefully designed to focus on developing technologies that are relevant to the needs of potential users, technically reliable, and economically competitive. Availability of desirable technologies is a pre-requisite for technopreneurship to be viable. It will be extremely challenging to encourage technopreneurship if business enterprises are not interested in indigenous technology developed domestically. Growth and transformation spinoff firms will also be very difficult, no matter what or how much incentives provided by government.

With all these factors coupled with the fact that technology is research based and developmental and so as to sustain its existence as well as the global business practice, solution in the positive direction is imperative, a fulcrum for development is needed. Creativity training and entrepreneurial skills is needed combined with experiences. The intellect is within us, technology is here to stay. Promoting innovative entrepreneurship should thus be central concern for policymakers. It requires that government officials themselves act as technopreneur in implementing policies, and promoting new partnerships with the stakeholders. The success of future innovators as well as the future sole depends on whether the government is ready to do this bidding and accept the task ahead. Technologi calinnovationsem power us and grow the economy.

VI. CONCLUSION

Technopreneurship is the process organizational creativity it is also a process of main streaming innovation to continually find solution to important corporate problems and implementing the solutions to, in turn satisfying the economy or target. It also laysemphasis on integrating technology with entrepreneurship. Technopreneurs are entrepreneurs who are into the intimate business of technology based industries. They make use of technology to come up with innovative eproducts through commercialization.

Aspiring technopreneurs mustbe adequately equipped with both technical and business skills. Technopreneurs continually go through the process of constant improvement and always try to redefine our dynamic digital economy. We need to encourage entrepreneurial views and skills at all levels of the society.

VII. CONCLUDING REMARKS

There is no denying it that technopreneurship must be encouraged, nurtured and facilitated. But however, all aspects of technopreneurship should be extensively examined and vetted so as to fully understand the challenges it brings in every phase of the technopreneurship development. Enacted policies in developing technologies should be properly directed and their Research and development capacity should be continuously improved such that they will be able to create relevant technologies to always suit user's needs, technically reliable, and economically competitive. Relevant, reliable, and competitive technologies are pre-requisite for a successful technology transfer. Also the absorbing capacity of existing business enterprises needs to be improved. All the above said submission will not only just increase technological demand but the economy as a whole, technopreneurship will be viable and be a major contributing factor to the realization of indigenous technologies to social and economic developments.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Molt, P.E(1972), "Characteristics of effective organization "Harper and Row publisher
2. Venkataraman, S., 2004. Regional transformation through technological entrepreneurship. *Journal of Business Venturing* 19, 153-167
3. Kenneth Neil Cukier 2006: "Hero with a Thousand Faces: Innovative Entrepreneurship and Public Policy" Report of the 6th Annual Rueschlikon Conference on Information Policy, Swiss Re, Zurich.
4. Grimaldi R., Kenney M. Donald Siegel D. S. and Wright M. (2011) 30 years after Bayh-Dole: Reassessing academic entrepreneurship Research policy- Elsevier Research Policy40: 1045-1057
5. Lalkaka, R., (2002). Technology Business Incubators to Help Build an Innovation-Based Economy. *Journal of Change Management*, 3 (2), 167 – 176.
6. Fang, Z., (2002). E-Government in Digital Era: Concept, Practice and Development. *International Journal of the Computer, Internet and Management*, 10 (2), 22.
7. Oakey, R. P., (2003). Technical Entrepreneurship in High Technology Small Firms: Some Observations on the Implication for Management. *technovation*, 23 (8), 679 – 688.
8. Renko, H., Autio, E., Tontti, V., (2002). Social Capital, Knowledge and the International Growth of Technology-Based Firms. *International Business Review*, 11 (3), 279 – 302.
9. Yunos, M. G., (2002). Building an Innovation-based Economy: The Malaysian Technology

- Business Incubator Experience. *Journal of Change Management*, 3 (2), 177- 178.
10. Dahlstrand, Lindholm, A., (1999). Technology-Based SMEs in the Goteborg Region: Their Origin and Interaction with Universities and Large Firms. *Technovation*, 33 (4).
 11. Florida, K., Kenney, M. (1988). Venture Capital and High Technology Entrepreneurship, *Journal of Business Venturing*, 3(4), 301-319.
 12. Kakati, M., (2003). Success Criteria in High Tech New Ventures. *Technovation*, 23,447-457.
 13. Online, (May12, 2013) "Technopreneurship is one way. We need Technopreneurship" <http://you.thmakingchange.Blogspot.com/2012/05/technopreneurship-is-one-we-need.html>
 14. Burnett, D., (2000). The Supply of Entrepreneurship and Economic Development. Retrieved on April 3 2003 from <http://www4.ibm.com/software/developer/library/su-sing.html>
 15. Etzkowitz, H., (2003a). Research groups as 'quasi-firms': The invention of the entrepreneurial university. *Research Policy*, 32(1), 109-121.
 16. Petti, C., & Zhang, S. (2011). Factors influencing technological entrepreneurship capabilities: Towards an integrated research framework for Chinese enterprises. *Journal of Technology Management in China*, Forthcoming.
 17. Antoncic, B. & Prodan, I. (2008), Alliances, corporate technological entrepreneurship and firm performance: testing a model on manufacturing firms, *Technovation*, Vol. 28, pp. 257-65.

GLOBAL JOURNALS INC. (US) GUIDELINES HANDBOOK 2017

WWW.GLOBALJOURNALS.ORG