Understanding SME Techno-Entrepreneurship in Nigeria's IT Clusters

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INTRODUCTION

The adoption of technology in everyday business and social life has created thousands of jobs in the form of micro, small, and medium enterprises (MSMEs) which have become significant contributors to gross domestic products (GDP) of several national economies. These MSMEs overtime aggregate to form business clusters that are typical of innovation hubs, technology clusters, and commercial nerves that support business and everyday lifestyle. These clusters have become integral to the development of local contents for solving indigenous problems. Waldman-Brown, Obeng and Adu-Gyamfi (2013) define a cluster as a large conglomeration of firms in related industries, located in a specific region. Entrepreneurs in information and technology clusters largely depend on informal knowledge in order to acquire skills that will enable them effectively tackle IT problems. Bakar and Zainol (2015) note that these entrepreneurs (especially those in technological clusters) have the potential to advance indigenous technology if well nurtured. Their reliance on informal knowledge continues to grow mainly because they are mostly artisans who have no formal education. Given the need to grow their competence and innovativeness, networking and collaboration among co-operators within and outside ICT clusters where they operate are have become imperative.

There is also the rapid-obsolescence of technology which means that new knowledge of emerging technologies is needed to meet service support needs. Entrepreneurs must be able to identify and absorb knowledge from the immediate and wider environments in order to meet their clients' needs. This requires interaction with different types of actors for the accumulation, synthesis and codification of the relevant information and knowledge needed to actualize different types of innovations (Nwagwu & Ibeku, 2016; Tepic *et al.,* 2012). Innovations occur in various establishments; however, innovative technology businesses are often located in clusters (Baptista & Swann, 1998; Porter, 1998; West, 2001; David-West, Umukoro, & Onuoha, 2018) in what is typical to business incubation and acceleration setting. Similarly, collaboration or teamwork also facilitates the development of new ideas that might emanate from customers, employees and competitors. For example, feedbacks from customers on a product's use could be considered useful in the subsequent modification or design of the product. Through this iterative knowledge reconstruction, new products (frugal outcomes) that are tailored towards customer needs begin to evolve through a frugal mindset and process (David-West, Iheanachor & Umukoro, 2019a).

Nigeria has over the years been a large consumer of information and communication technologies with low innovative and development capabilities in the IT space. The cost of technology is however often too high for the mass market, thus calling for a frugal mindset in bridging the technology divide between and within nations (Soni & Krishnan, 2014) classified as developed, developing and underdeveloped economies. There is also the digitisation of businesses and processes alongside the emergence of new business models that disrupt the incumbent traditional pipe businesses (David-West et al., 2018).

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In response to this digital disruption, many businesses have now migrated from the traditional model for digital enterprises while some are still in their evolutionary stages. This paradigm shift has created another category of entrepreneurship known as techno-entrepreneurship that is manned by a new archetype of entrepreneurs now framed as techno-entrepreneurs or digital-entrepreneurs.

Ironically, the concept of what attributes characterise techno-entrepreneurs, how they behave, and their levels of engagements across different levels of assets, resources and capabilities (ARCs) within IT clusters is yet to be documented. This is necessary as it helps in designing capability measures that help develop the ecosystem as well as strengthen local content for meeting national information and communications for development (ICT4D) priorities. This study therefore critically examines the emergence of techno-entrepreneurship in Nigeria's IT clusters and its role in the development of information technology products and services in solving first, Nigeria's local IT demands, and Africa at large. The rest of the chapter is organized as follows. Following this introduction, a brief description of the methodology adopted is provided, and after that, an overview of the concept of techno-entrepreneurs and SME techno-entrepreneurship is provided. This is followed by a section on SME techno-entrepreneurship clusters in Nigeria; attributes of SME techno-entrepreneurship in Nigeria, its relevance to the ICT ecosystem growth as well as national development. The paper concludes with a section on challenges and opportunities of SME techno-entrepreneurship in Nigeria.

BACKGROUND

This chapter is a conceptual framing of the concepts and issues of SME techno-entrepreneurship in Nigeria's ICT clusters. While the findings reported are not empirical, they are evidence of a rigorous literature review and ecosystem observation of the SME techno-entrepreneurship ecosystem in Nigeria. Three established ICT clusters that have been major contributors to Nigeria's economy were purposively selected and observed in this study. In order to provide a conceptual framing of techno-entrepreneurship practices across ICT clusters, a review of related literature was carried out. This was used to arrive at substantive concepts and issues which were later validated through cluster observations. A literature search using internet keyword searches was performed using dedicated databases such as JSTOR, Google Scholar, Emerald Insights, Ebscohost and industry publications between November 2018 and October 2019. Using an integrative approach to objectively critique, summarize and draw conclusions (Christmals & Gross, 2017; LoBiondo-Wood & Haber, 2010), themes on techno-entrepreneurs, SME techno-entrepreneurship, SME techno-entrepreneurship clusters in Nigeria, attributes of SME techno-entrepreneurship in Nigeria, and relevance of SME techno-entrepreneurship to ICT ecosystem growth as well as national development were explored. Relevant and related themes were further clustered, analysed and synthesise for coherence using a 'Best Fit' approach (Carroll *et al.,* 2013) involving a two-phase analysis. The first phase was to cluster similar themes and synthesis of same for coherence to arrive at an academic viewpoint, while the second phase involved synchronization of the output of the first phase to arrive at the conceptual framing presented in this chapter.

Overview of Techno-Entrepreneurs and Techno-Entrepreneurship in Nigeria

Techno-entrepreneurs devise and harness new strategies of solving IT problems in a frugal manner amidst resource constraints relating to assets, resources, and capabilities. These concepts have been studied in-depth in innovation literature (Ibeku, 2018; Nwagwu & Ibeku, 2016; Tepic et al., 2012; Klerkx and

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