

Disruptive Technologies and Organizational Performance in Developing Countries: Experiences of Ghanaian Businesses

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Abstract-With the advent of the fourth industrial revolution, which heavily emphasizes the need for connectedness and access to real-time insights across processes, partners, products, and people, businesses and organizations are increasingly turning to technology and digital-based platforms. Putting the subject in the context of developing nations, Ghanaian enterprises are poised to embrace this industrial revolution since they recognize the importance of disruptive innovation as a competitive tool which significantly impacts organizational performance. The study adopts content analysis and desktop literature review to explore and examine the extent to which disruptive technologies affect the performance of businesses in developing countries by putting the Ghanaian scenario in introspection. Purposive sampling technique was employed to sample 10 existing literature on disruptive technology and the performance of businesses. Christensen's Theory of Disruptive Technology, served as the theoretical framework for the study.

Keywords: Disruptive Technology, Developing - countries, Organizational-Performance.

INTRODUCTION

Emerging technologies have the potential to disrupt the status quo by altering patterns of resource use, working relationships in organizations and consequently rearrange value pools. Such technologies have been characterized by Christensen (1997) as disruptive technologies. Christensen in his book "The innovators Dilemma" defined Disruptive Technology as the one that displaces an established technology and shakes up the industry, or a ground-breaking product that creates a completely new industry. Kassicieh (2002) defines disruptive technologies as scientific discoveries that break through the usual product/technology capabilities and

provide a basis for a new competitive paradigm. Disruptive technologies and large-scale technology changes create winners and losers while also introducing new types of interaction that undermines traditional and institutional operating and redistribution systems. Technology improves a company's ability to compete, increase revenue and output, improve operational efficiency, and increase customer satisfaction. Historically, technological change also reshuffled spatial hierarchies, with the decline of old sectors and the rise of new technological domains often corresponding to the progress and decline in performance of businesses. Organizations recognizes the significance of technology and its role in sustaining a competitive advantage. At the same time, investing in innovative technologies might have a risk impact on an organization's operations. Organizations face a perpetual threat and opportunity as a result of technological change. According to Madsen and Hartington (2015), disruptive technologies can have an impact on any organization. A business may be satisfied with the sustaining technology, but is less aware of disruptive technology that could be a threat to the information systems. If a business does not respond in time to the disruptive technology, it could lose its competitive edge or the business could be vulnerable to external threats. Hence, as asserted by Madsen and Hartington (2015), firms should keep abreast with changes in all aspects of its operations. Disruptive technologies have the potential to create a new marketplace and as a consequence make other industries redundant (Yang, 2001). Technology has become central to business and society, and the success of a firm has become increasingly dependent on how the firm will be transformed by disruptive technology (Dhar & Sundararajan, 2007:126)

Schumpeter (1942) opines that in the long run, competition for technology will define the survival of firms to a large extent. This competition will alter the foundations of their being and not just their profit margins. He called this phenomenon ‘creative destruction’, meaning that a successful radical technological innovation would create discontinuity as the purchasing behavior of clients would change with new technology thus reducing the demand for established firms’ products (Hill & Rothaermel, 2003).

The narrative of disruptive technology in Ghana cuts across nearly every facet of the business ecosystem. Disruptive technologies have become prevalent in the various sectors of the Ghanaian economy and as a result impacted significantly on the performance of several organizations leading them to develop business models with strategies for implementing these digital innovations in their operations.

OBJECTIVE OF THE STUDY

This paper sought to explore and examine the extent to which disruptive technologies impact the performance of businesses in Ghana.

HYPOTHESIS

Disruptive technology significantly affect organizational performance.

LITERATURE REVIEW

THE THEORY OF DISRUPTIVE TECHNOLOGY

Disruptive Technology was coined by Clayton Christensen in his 1997 best-selling book, “The Innovators Dilemma: When New Technologies Cause Great Firms to Fail.” He described Disruptive Technology as the one that displaces an established technology and shakes up the industry, or a groundbreaking product that creates a completely new industry. Christensen finds that disruptive technologies may enter and expand emerging market niches, improving with time and ultimately attacking established products in their traditional markets.

Christensen argues that due to the unpredictable nature of disruptive technology, successful and well managed firms can also be negatively affected. In his theory, Christensen distinguished between sustaining technologies and disruptive technologies in which

sustaining technologies add value or leads to incremental improvements to an already established technology whilst disruptive technologies disrupt or redefine performance levels thereby creating a new marketplace (Anthony, 2004). In general, technological improvements result in performance improvement of established products. These products usually become faster, cheaper, louder, and smaller, as indicated by the above characteristics of disruptive technology (Christensen & Bower, 1996). These new innovations will be simpler and opportune to customers because they remain in line with their current needs and expectations. Christensen regards these kinds of developments as “sustaining in character”. Great firms direct the industry to embrace these innovations and exploit potential benefits of these technologies.

As competition increases, firms attempt to upgrade their performance levels by producing better products in order to attain more customers in the market. The improvements in performance will however, increase at a faster rate than anticipated customer needs, a situation which will give rise to disruptive technologies (King & Baatartogtokh, 2015). In Christensen model, the x-axis represents time, the y-axis represents the product performance and the z-axis represents consumer segments. The two dimensions, time and performance define a particular product in a market. The third dimension or z-axis represents satisfied customers whose needs are being met by the increased uses of the products. The more the performance of a product increases, the more the needs of customers are being met and eventually customer’s expectations are surpassed. This situation will leave a gap of unmet needs which requires simpler and convenient product offerings (Christensen & Raynor, 2013).

This model is useful as it provides insights to business associates and managers on the impact of disruptive technologies and why many firms fail when confronted by such technologies. The model would also help managers to determine whether an idea or technology is disruptive or not. It also provides guiding principles to new firms to commercialize disruptive technologies (Habtay & HOLEMEN, 2012). As explained by Anthony (2004), this model creates awareness among managers on the potential of their firms. In this respect and due to increased competition, firms in recent years have and are trying to improve

their market position, business performance and competitive advantage by developing new capabilities within their businesses through the accumulation of new resources, for example investing in new technologies, hiring new expertise, adopting new production lines and product diversification.

Disruptive technology however lacks refinement, often has performance problems because it is new, appeals to a limited audience and may not yet have a proven practical application. (Such was the case with Alexander Graham Bell's "electrical speech machine," which we now call the telephone.) A disruptive technology may force companies to alter the way they approach their business, risk losing market share or risk becoming irrelevant.

DISRUPTIVE TECHNOLOGY IN GHANA

The ease with which businesses in Ghana (no different other African countries) are embracing technological disruption affirms the position of Madsen and Hartington (2015) that disruptive technologies can have an impact on any organization. It gives the impression as though the region is on a mission to make up for the time and opportunity lost during the 20th century. Digital disruption in Ghana spans the entire business spectrum. For example, owing to digital innovation in the banking sector, UT Bank improved turn-around time for loan processing for both the retail and business customer segments. The context was such that the financial sector had settled on a market equilibrium that barely met customer satisfaction. But due to weak customer bargaining power in the money market, this equilibrium had endured for a long time. From the perspective of the Strategy Canvas, UT Financial Services' value proposition struck an emotional cord by releasing value to customers at a time competitors couldn't care less about customer turn-around complaints. The company also instituted robust processes that helped managed SME risk through effective valuations, monitoring and collections. Similarly, Zenith Bank also introduced a product that combined features of a savings account with that of a current account thereby creating a hybrid. As a result customers have the use of a cheque book on an account that charges zero commission on turnover (C.O.T).

In November, 2013 Ghana's health sector witnessed a major disruption with the launching of the first-ever telemedicine center in the country by the County

Group of Hospitals in collaboration with the Apollo Group of Hospitals in India. Telemedicine according to Ghana Health Nest, an online health news hub in Ghana and Africa, is the use of telecommunication and information technology in order to provide clinical health care from a distance. Telemedicine, by which the best healthcare is brought to everybody through the expertise of highly qualified doctors through technology, would be the next big thing in Ghana and Africa at large according to Dr. Kwame Antwi, CEO of County Group of Hospitals. A report by Amexo K. (2014) titled "Bisadoc", telemedicine which is clinical services using internet, wireless, satellite, and telephone media would change the status quo of the traditional healthcare delivery involving the face-to-face contact with a doctor. Also, The Novartis Foundation another pioneer of telemedicine in Ghana reported in 2016 that in their pilot telemedicine program, preliminary results showed more than half of all teleconsultations could be resolved directly by phone. This is a big deal considering how long patients have to wait in queues in hospitals to see a physician. The Novartis Foundation projected that national coverage of telemedicine services is expected to be possible. (Navas Foundation, 2009).

Notwithstanding, the Ghanaian media space has had its own share of disruptive technology penetration. Media houses in the country are busily changing their organization structures in an effort to keep pace with digitalization. According to a report by Deutsche Welle (DW) Akademie (2018), media houses in Ghana have primarily invested in the expansion of their social media channels and are thus ensuring more digital participation. The report also underscores that despite the investment by media houses in digitalization, they face keen competition from the internet, with the blogs and online media channels, social media entrepreneurs are competing against traditional outlets for advertising revenues.

In addition, companies such as mPedigree Network is leading the innovation charge with a business model that has disrupted the status quo to unlock value for consumers of pharmaceutical companies and at the same time erect entry barriers against competitors. Customized proprietary technology and first-mover advantage has created high entry barriers for competitors thereby creating an uncontested market space. This is the core essence of business model innovation; disrupting markets to create uncontested

spaces. The outcome is growth, growth and more growth.

mPedigree Network started out by creating a solution to combat drug counterfeiting that requires sending SMS text message of a unique code on any purchased drug to receive a response authenticating or flagging the medicine as counterfeit. The turn-around time for the response is between 3-10 seconds with a hotline to report if the query flags the drug as counterfeit. The company has since leverage the solution to cover textile counterfeiting. Indeed, growth opportunities exist in other markets such as agribusiness where consumers or stakeholders are faced with similar risks. Data management is handled by mPedigree's key network partner, Hewlett-Packard. A wide network of Telecommunication companies, located across various markets, provide a critical component of the infrastructure that enables end-users query the database for quick response. Global pharmaceutical companies who are benefitting immensely through revenue safeguards, have signed up to the company's flagship product, GoldKeys. It is also important to mention companies such as Essoko, which provides real-time market data to farmers via a proprietary mobile application. Such tech-driven disruptions unfortunately are the exceptions in the Ghanaian market. The challenge is to scale up in order to achieve a critical mass of corporates that may drive the economic transformation agenda (Nkunimdini, 2015).

METHODOLOGY

The study adopted content analysis and desktop literature review which focused on published journals and research papers on disruptive technologies and organizational performance. For the purpose of the study, the researcher sampled ten 10 existing literature on disruptive technology and the performance of businesses. Purposive sampling technique was employed in the selection of the literature, specifically, critical case sampling which involves selecting a small number of important cases to yield the most information and have the greatest impact on the development of knowledge. (Patton, 2015). Yamane (1967) formula was used to calculate the sample size. Yamane Formula:

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

Where;

n= sample size

N= size of population

e= error term of 5%

Therefore;

$$n = \frac{10}{1 + (0.05)^2}$$

$$n = 9$$

A sample of 9 existing literature was purposively selected for review. Christensen's Theory of Disruptive Technology, served as the theoretical framework for the Study.

FINDINGS

The purpose of this study was to explore and examine the extent to which disruptive technologies impact the performance of businesses in Ghana. The review of literature revealed that disruptive technology have a significant impact on business performance. The paper underscored that Ghana like most developing countries has embraced disruptive technology and digital transformation since businesses in these countries recognizes its role in sustaining competitive advantage and will in the long run determine the survival firms. In addition, it was found that organizations have develop business models with strategies for implementing these digital innovations in their operations. (Nkunimdini, 2015).

RECOMMENDATION

Business leaders should be more open to adopting disruptive technologies to improve on both financial and non-financial performance as well as their competitiveness within their industry by leveraging the positive aspects of disruptive technologies. Moreover, businesses should provide an environment in which employees can propose and explore new ideas and new technologies and also, organizations should utilize disruptive technology, within the right business units, with the right opportunities at the right time (Evans, 2003).

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