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**IMPACT OF DISRUPTIVE TECHNOLOGY ON THE
PERFORMANCE OF INSURANCE FIRMS IN KENYA**

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IMPACT OF DISRUPTIVE TECHNOLOGY ON THE PERFORMANCE OF INSURANCE FIRMS IN KENYA

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Abstract

Purpose: The purpose of this paper was to explore the impact of disruptive technology on the performance of insurance firms in Kenya.

Methods: The study utilized desktop literature review and focused on previously published journals in PDF format that address technology and the performance of insurance firms. A total of 13 journals was found relating to technology and the performance of insurance firms. The study utilized a sample of 12 journals which were randomly selected from a list of published journals in PDF format relating to disruptive technology and performance of insurance firms. The theories underpinning of the study entailed Christensen's Theory of Disruptive Technology, the Diffusion of Innovation Theory and Schumpeterian Theory of Creative Destruction.

Results: The review of literature revealed that various aspects of disruptive technology have a significant impact on organizational performance. The review showed that mobile phone technology has a significant influence and explains to a large extent the growth of micro insurance in Kenya. It was also found that the increase in industrial convergence, technological innovation and social digital trends increases the financial performance of financial institutions including insurance firms. The study also established that there is a strong and positive relationship between insurance innovation strategies and a firm's performance. In addition, it was found out that real-time business evaluation through big data analytics boosts overall performance and profitability, thus thrusting the organization further into the growth cycle.

Unique Contribution to theory, practice and policy: The leadership and management of insurance companies should put greater emphasis on the adoption of disruptive technologies to improve on both financial and non-financial performance as well as their competitiveness within the industry. These include Big Data, Analytics, Artificial Intelligence Systems, Cloud Computing and Digital Currency Technologies. Processes in the organizations should be refined to ensure that they are efficient and effective as this serves to increase market share and to reduce on operational costs. Moreover, explorations in disruptive technology should continue in the insurance industry as these would play a significant role in ensuring that efficiencies and effectiveness of business processes are achieved. The Insurance Regulatory Authority (IRA) should also develop policies that encourage innovation and the adoption of technology. The authority whilst exercising due diligence in its mandate to protect consumers should ensure policies do not stifle the growth and creativity of insurers. The regulatory body should also strive to create a favourable environment for the adoption of disruptive technologies.

Keywords: *Disruptive technology, performance, insurance firms.*

1.0 INTRODUCTION

A disruptive technology is one that displaces an established technology and shakes up the industry or a ground breaking product that creates a completely new industry. According to Clayton Christensen in his book “The innovators Dilemma” disruptive technology lacks refinement, often has performance problems because its new, appeals to a limited audience and may not have a proven practical application. Christensen (2001) discovered that disruptive technologies may enter and expand emerging market niches, improving with time and ultimately attacking established products in their traditional markets. 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.’ Technology enhances a firm’s competitiveness, growth in revenue and production, operational efficiency and customer satisfaction. Disruptive technologies have the potential to create a new marketplace and as a consequence make other industries redundant (Yang, 2001).

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.

A firm that tries to outperform its competitors, introduces new services or products. The desire of firms to innovate is dictated, among other things, by threats and/or opportunities induced by the emergence of disruptive technologies which replace the existing ones (Anderson & Tushman, 1990; Christensen, 1997). Disruptive technologies have the potential to impact growth, employment, and inequality by creating new markets and business practices, needs for new product infrastructure, and different labor skills. This, in addition to affecting existing firms in established markets, can also affect the labor market, incomes of workers, and ultimately the distribution of income (Leipziger & Dodev, 2016).

Schumpeter was among the first to notice 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 behaviour of clients would change with new technology thus reducing the demand for established firms’ products (Hill & Rothaermel, 2003). Insurance companies provide unique financial services that drive the growth and development of an economy. Such specialized financial services range from underwriting of risks inherent in economic entities and the mobilization of large amounts of funds through premiums for long-term investments (Pearson & Robinson, 2007). The ability of Insurance companies to continue operations hinges on their capacity to create profit or value for their shareholders. Indeed, a well-developed and evolved insurance industry is a boon for economic development as it provides long-term funds for infrastructure development. (Charumathi, 2012).

Recently, the country has witnessed a transformation in the way insurance services are delivered. Mobile phones have enhanced the rapid penetration of insurance more so to the mass-market. This has further created opportunities for new business models such as the Mobile Micro

Insurance. Empowered with mobile connectivity, micro insurance providers are increasingly utilising mobile technology platforms to deliver new micro insurance products hence transforming the insurance landscape in Kenya.

The performance of insurance companies in Kenya remains low with the overall insurance penetration at 2.93% in 2014 down from 3.44% in 2013 (Association of Kenya Insurers Report [AKI], 2014). This has been attributed to low consumer knowledge and little awareness of insurance products, negative perception of insurance, low consumer purchasing power, low returns as compared to other investment options, poor service and price undercutting among insurers (Gitau, 2013). Despite this scenario, industry players are optimistic about the growth potential of the sector in Kenya; low penetration experienced suggests that significant opportunities exist in the market. Further, mergers and acquisitions witnessed in the industry since 2014 indicate positive investor sentiments in the growth potential and stability of the insurance sector in Kenya (AKI Report, 2014). However, the entry of new players in the industry not only signifies growth opportunities but also signals higher competition resulting to dwindling fortunes for already existing market players (Gitau, 2013). Therefore, to ensure improved performance in the rapidly changing environment, industry players are embracing innovation. This is because innovation is widely recognized in literature as a critical enabler for firms to create value and sustain improved performance (Drucker, 2013). In order to be successful, insurers in Kenya must therefore conduct continuous research and innovate for sustainable performance.

The insurance industry is known to be one of the key engines of economic development in the whole world given that it facilitates trade and foreign exchange besides giving people peace of mind to carry out their day to day operations (Arena, 2006). Its performance and growth therefore cannot be under estimated. The number of players in the Kenyan insurance industry has grown by 37% over the last five years; unfortunately, penetration has not increased in the same proportion. In view of this, industry players need to develop products cutting across all segments in order to ensure that a majority of the population are insured and can access insurance products without leaving a very huge gap (AKI, 2010).

1.1 Objective of the Study

The aim of this paper was to explore the impact of disruptive technology on the performance of insurance firms in Kenya.

1.2 Hypothesis

H₁: Disruptive technology has a significant influence on performance of insurance firms in Kenya.

2.0 LITERATURE REVIEW

2.1 Christensen's Theory of Disruptive Technology

Disruptive technology model from Clayton Christensen is a theory best used to discuss the impact of new and ground breaking technologies on a firms' existence. This model was introduced by Christensen in 1997 in his book "The Innovators Dilemma: When New Technologies Cause Great Firms to Fail." This model was a function of performance and time in

relation to new technology. This model also describes the inability of great firms to counter the impact of new technology.

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 sustainable technologies and disruptive technologies in which sustainable technologies add value to existing and already established products 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.

2.2 Diffusion of Innovation Theory

This theory was postulated by Rogers (1995). Diffusion occurs progressively within a market (a system of users) when information and opinions about a new technology are shared among potential users through various communication channels. In this way, users acquire personal knowledge about new technology (Rogers, 1995). Knowledge is the first step of Rogers’ five-stage process of adoption. The other four steps are: persuasion, decision (to adopt or to reject new technology), implementation and confirmation. Accepting this framework, non-adoption can

be explained as the final outcome of an individual process of adoption that failed (Rogers, 2003). Rogers argues that a great number of conditions (e.g. personal limitations of the potential user) and/or external obstacles (e.g. ineffective communication channels) may inhibit the success of the adoption process (MacVaugh & Schiavone, 2010).

According to this theory, the rate of diffusion is affected by an innovation's relative advantage, complexity, compatibility, trialability and observability (Agarawal & Prasad 1998). Rogers (1995) defines relative advantage as 'the degree to which an innovation is seen as being superior to its predecessor'. Complexity, which is comparable to technology acceptance model's (TAM) perceived ease of use construct, is 'the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand'. Compatibility refers to 'the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters'. Trialability is the 'degree to which an idea can be experimented on a limited basis'. Finally, observability is the 'degree to which the results of an innovation are visible' (Rogers, 1995).

In an organizational context, when considering adoption and diffusion of technology, two concepts are significant: the radicalness of the innovation and its disruptiveness. Radicalness is generally regarded as the extent to which an innovation involves new technology that differs from what is existing (Dewar & Dutton 1986); disruptiveness of innovations refers to the extent that a customer segment (not mainstream) values the innovation such that it disrupts mainstream markets. In terms of innovation, radicalness relates to a technology dimension: disruptiveness to a market dimension (Govindarajan & Kopalle, 2006).

2.3 Schumpeterian Theory of Creative Destruction

Schumpeter (1939) considered innovation as both the creator and destroyer of corporations and entire industries. He was among the earliest scholars to note the disruptive nature of technological change observing that it could lead to waves of "creative destruction." Cristiano Antonelli, Pascal Petit and Gabriel Tahar (1992) note that, "in his early works Schumpeter insisted on the role of entrepreneurs in seizing discontinuous opportunities to innovate. Innovations were taken in a broad sense of new 'combinations' of producers and means of production, which includes new products, new methods of production, opening up of new markets, utilization of new raw materials, or even the reorganization of a sector of the economy.

In later years, Schumpeter (1942) placed greater emphasis on the role of larger enterprises in innovation, seeming to believe that as scientific knowledge accumulated there was a threshold investment in R & D below which a firm could not be an effective player. Schumpeter argued that entrepreneurs, who could be independent inventors or R&D engineers in large corporations, created the opportunity for new profits with their innovations. In turn, groups of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. However, before the economy could equilibrate a new innovation or set of innovations, conceptualized by Schumpeter as Kondratiev cycles, would emerge to begin the business cycle over again.

2.4 Empirical review

Gitau's (2013) study on the strategies adopted by Kenyan insurance companies to alleviate low insurance penetration used a descriptive survey research design and analysis to establish the causal relationship. The study determined the factors causing low insurance uptake in Kenya, the

challenges faced by insurers in marketing their products and the strategies that companies can adopt to enhance insurance uptake. The study observed that there is a general lack of creativity and innovation among insurance companies which causes unhealthy competition. A report by UAP Insurance Kenya (2013) on delivering insurance through mobile platforms indicated that insurance penetration is at 3% in Kenya and most companies have not adopted innovative marketing strategies. The report found out that initiatives such as improved regulatory framework, innovative products, and adoption of alternative distribution channels; enhanced public education and the use of technology have contributed to the improved penetration level in Kenya.

Gikonyo (2014) studied the effect of mobile phone technology on the growth of micro insurance in Kenya. In this study, micro insurance growth was measured using the total amount of premium paid by clients covered under micro insurance. The independent variables included annual number of clients enrolled through mobile phone technology, annual amount of clients' premium paid through mobile phone technology and the annual amount of clients' claims paid through mobile phone technology. The study revealed that mobile phone technology explains to a great extent the growth of micro insurance in Kenya. This study however, concentrated on micro insurance providers thus the results could not be generalized for the entire industry.

Bissessar (2016) examined the usage of digital currency technology as a disruptive technology in the Caribbean sub region with a view to drawing attention to the opportunities and risks associated with this new phenomenon. This study utilized three main sources of data collection: a literature review of sub regional and international sources, a solicitation of views from experts in various fields engaged in the sphere of electronic payments, and a formal survey of the sub region's Central Banks regarding awareness of digital currency and mobile money in the evolving landscape of electronic payments. The study found that the Caribbean could benefit from innovations in payments technology. While digital currency and mobile money were technologies that could make a contribution in this area, their development was retarded by a reluctance to engage with them on the part of financial regulators. This study, however, did not show the relationship between the use of digital currency technology and the success of firms that have embraced such payments.

Aoko (2017) studied the effect of digital disruption on the financial performance of commercial banks in Kenya with a focus on Ecobank Bank Kenya Limited. To achieve this, the study sought to identify the effect of Digital Competition, Industrial Convergence, Technological Innovation and Social Digital Trends on the financial performance of Ecobank measured by Return on Assets (ROA). A regression analysis indicated that an increase in industrial convergence, technological innovation and social digital trends increased the financial performance of the bank. However, an increase in digital competition reduces financial performance. This study, however, shows a conceptual gap as it explored Digital Competition, Industrial Convergence, Technological Innovation and Social Digital Trends as the disruptive technologies.

Maina (2016) sought to analyse the effect of innovation strategies on the performance of insurance firms in Kenya. In this study the performance parameters included service reliability, reduction in operational cost, customer satisfaction as well as timely delivery of services. The independent variables were technological strategies, marketing strategies, and product and process innovation strategies. The technological innovation studied included adoption of new systems such as enterprise resource planning (ERP), automation of routine processes as well as

business process innovation. The study established that there is a strong and positive relationship between insurance innovation strategies and a firm's performance. However, this study was not exhaustive on technological innovations. It presents a conceptual gap as it focused on innovation strategies while the current study will focus on disruptive technologies and determine its relationship with the performance of insurance firms. In addition, the current study will use profitability ratio, return on assets and return on equity as performance parameters.

Srivastava and Gopalkrishnan (2015) studied the impact of big data analytics on banking and financial systems. The author noted that as customer volume increases, it dramatically affects the level of services offered by the organization. It was also found that existing data analytics practices have simplified the process of monitoring and evaluation of banks and other financial services organizations, including vast amounts of client data such as personal and security information. With the help of big data, banks can now use this information to continuously track client behaviour in real time, providing the exact type of resources needed at any given moment. This real-time evaluation in turn boosts overall performance and profitability of the organisations. The researcher also pointed out that the three primary areas where banks and other financial organizations can attain benefits from advanced analytics are customer experience, operations optimization and employee engagement.

Another scholar, Kruger (2011) examined the understanding of the use of strategic intelligence as a strategic management tool in the long-term insurance industry in South Africa. The paper obtained the qualitative views and opinions of strategic decision makers, on an executive managerial level within the South African long-term insurance industry and on their organizations use of strategic intelligence. It however yielded marked differences in the conformity and usage of strategic intelligence and its components between the companies surveyed, with a measurable difference between large and small companies. It was however, generally viewed that the use of a strategic intelligence framework could greatly enhance decision-making. This study was done in a more developed economy with an insurance penetration of 13% compared to Kenya which is an emerging economy and with a penetration rate of 3.4% thus a contextual gap. Pirttilä (2007) examined strategic intelligence and competitor analysis in a large industrial company, and thus the external information and environment are emphasized. The objective of the study was to deepen the knowledge of different intra-organizational processes that are used in a corporate organization to manage and exploit the vast amount of competitor information that is received from the environment. This study was also done in a developed economy.

Didier and Olsson (2011) in a study on micro insurance and the importance of an inclusive approach in service innovation understood the important role of process improvements with the help of technology to achieve service innovation by first observing the endogenous and exogenous drivers that lead to innovation. The findings enabled the articulation of the main advantage of technological innovation, which is, that stakeholders do not start from zero, they do not start with nothing. Every firm has its own base of knowledge, which they share to achieve a common goal. In the case of micro insurance for instance, a success factor was the ability to reuse an existing platform of payment. The high penetration of mobile technology in emerging markets was particularly important here due to the lack of infrastructure and the search for cost reduction. This study, however, did not show the relationship between service innovation and improvement in the performance of insurance firms

Seksiri and Suriya, (2015) sought to study the impact of mobile broadband as a disruptive technology on non-life insurance industry in Thailand and Singapore. This study investigated whether the non-life insurance industries in Thailand and Singapore were growing by the usage of mobile broadband technology. It examined the impact of the third generation (3G) mobile phone network in Thailand and compared the same to the impact in Singapore as a benchmark. It also examined the impact of the fourth generation (4G) mobile phone network in Singapore to learn the effects that may occur in Thailand after the country begins to offer the service later. It used piecewise regression to analyse the trend before and after those countries adopted mobile technologies. The results showed that mobile broadband both in terms of 3G and 4G technologies did not significantly affect the growth of the non-life insurance industry in both countries. They revealed that insurance companies were incapable of catching up with mobile integration to such a degree that they can use mobile broadband to create opportunity, boost sales, and make profit for their businesses. The study presents a methodological as well as contextual gap as it dwelt on mobile broadband technology as the only disruptive technology that affects the insurance industry.

Kiraka, Kobia and Katwalo (2013) did a study to determine the causal effect of financial innovation on the financial performance of insurance companies in Kenya; where financial performance was measured by Return on Assets. The study found that most firms in the insurance industry make use of financial innovation strategies to keep pace with changing environments. The results also indicated that the relationship between new products and financial performance is insignificant and that operation processes and system innovations are statistically significant in explaining return on assets of insurance companies

Malit (2017) studied the effect of information and communication technology strategy implementation on organizational performance of the insurance sector in Kenya. The study aimed at determining the effect of ICT investment costs on the performance of the insurance sector in Kenya and determining the effect of ICT competency on performance of the insurance sector in Kenya. The parameters used to measure performance in this study included market share, profitability and Return on Investment. This study was informed by Information Systems Success Theory and Agency Cost Theory.

3.0 METHODOLOGY

The study utilized desktop literature review and focused on previously published journals in PDF format that address technology and the performance of insurance firms. A total of 13 journals was found relating to disruptive technology and performance of insurance firms. 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;

$$n = 13 / 1 + (0.05^2)$$

$$n = 12$$

A sample of 12 journal was randomly selected for review. The theories underpinning of the study entailed Christensen's Theory of Disruptive Technology, the Diffusion of Innovation Theory and Schumpeterian Theory of Creative Destruction.

4.0 FINDINGS

The review of literature revealed that various aspects of disruptive technology have a significant impact on organizational performance. The review showed that mobile phone technology has had a significant impact and explains to a large extent the growth of micro insurance in Kenya. It was also found out that the increase in industrial convergence, technological innovation and social digital trends increases the performance of financial institutions, insurance included. The study also established that there is a strong and positive relationship between innovation strategies and the performance of insurance firms. In addition, it was found that real-time business evaluation through big data analytics boosts overall performance and profitability, thus thrusting the organization further into the growth cycle.

5.0 RECOMMENDATION

The management of insurance companies should put greater emphasis on adopting disruptive technologies to improve on both financial and non-financial performance as well as their competitiveness within the industry. These include Artificial Intelligence, Big Data, Analytics and Digital Currency Technology. Processes in these organizations should be refined to ensure that they are efficient and effective as this serves to increase market share and reduce operational costs. Moreover, explorations in disruptive technology should continue in the industry as a whole as these play a significant role in ensuring that efficiencies and effectiveness of business processes are achieved. The regulatory body in the insurance sector should as well encourage an innovative culture within the industry. It should exercise due diligence in its mandate to protect consumers, but at the same time ensure that its policies do not stifle the growth and creativity of insurers. The regulatory body should also strive to create a favourable environment for adoption of disruptive technologies. Future research may also consider influence of disruptive technology on performance of manufacturing industry, tourism industry as well as healthcare industry.

6.0 SUGGESTIONS FOR FURTHER RESEARCH

The study makes the following suggestions for future researchers to perform a detailed investigation on the research areas to help shed more light on them:

- i. Impact of intellectual capital as an innovation asset on the performance of insurance firms
- ii. Effect of operations management automations (underwriting and claims) on the performance of Insurance firms.
- iii. Effects of social media technology on the performance of insurance firms in Kenya.

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