INNOVATION STRATEGIES, ENTREPRENEURIAL ORIENTATION AND PERFORMANCE OF DATA SERVICE PROVIDERS IN KENYA

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Innovation Strategies, Entrepreneurial Orientation and Performance of Data Service Providers in Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature…… Date ……..

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This thesis has been submitted for examination with our approval as University Supervisors.

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DEDICATION

I dedicate this Research Thesis to my family for their undying moral support and prayers throughout my study period.

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LIST OF ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
CAK:	Communication Authority of Kenya
CIDB:	Construction Industry Development Board
CIMP:	Construction Industry Malaysia Plan
CRM:	Customer Relationship Management
CNDPF	Comprehensive National Development Planning Framework
DSP:	Data Service Providers
DSL	Data Service Line
EO:	Entrepreneurial Orientation
ERP	Enterprise Resource Planning
GDP:	Gross Domestic Product
GRM:	Global Reference Model
ICT:	Information and Communication Technology
IoT	Internet of things
RIT	Research Innovation and Technology
R&D:	Research and Development
SIPs	Sector Investment Plans
SMEs:	Small and Medium Enterprises
SMS	Short Message Service

NDPs	National Development Plans
NEPAD	New Partnership for Africa's Development
OECD:	Organization for Economic Co-operation and Development
UCST	Uganda National Council for Science and Technology
WTO	World Trade Organization

DEFINITIONS OF TERMS

Data service providers are enterprises that provide access to the Internet. A data service provider (DSP) is an organization that provides a user with internet access via some sort of connection. The confluence of several trends, including the increasing migration of socio-economic activities to the Internet, can spur new industries, processes and products, thereby creating significant competitive advantages. In this respect, this study focuses on the centrality of Data Service Providers as platform of socio-economic activities as well as innovation activities.

Entrepreneurial orientation- It is a firm-level strategy which captures an organization's strategy-making practices, managerial philosophies, and firm behaviors that are entrepreneurial in nature (Wales, Covin, & Monsen, 2020), while considering innovativeness, and proactiveness inherent in employee wide as core defining aspects or dimensions of the orientation. (Linton & Kask, 2017). In the context of this study, entrepreneurial orientation was considered as the ability of the Data Service Providers to analyze their businesses beyond traditional perspectives, while looking for new ways of creating and capturing value through new business models infused by capturing specific entrepreneurial aspects within employees

Firm performance- This is the ability of an organization to efficiently exploit the available resources to meet internal and external goals of a firm that are consistent with the set objectives of the company, as well as considering their relevance to its users (Acen, 2019). This study viewed firm performance as

excellence in customer-focused performance, including customer satisfaction, and or product or service performance.

Internet of things (IoT) is a broad term that describes network connectivity to physical objects. These are called connectable or intelligent objects, and are embedded in electronic circuits and software that enable them to detect, collect and transmit data and information (Hancock & Hancock, 2016).

Market innovation strategies- Involves noting, adopting and meeting changing customer needs while opening up new markets or giving the firm's products a new position in the market to increase a firm's profitability (Hong, 2015). For data service providers, understanding and meeting diverse changing customer needs within internet services continuum, in this era of globalization and digitization, represent market innovation strategies.

Process innovation strategies- is an integrated concept that involves changing the method that a process takes and how it is delivered to the end-user, changing what services are offered and this might include discontinuing outdated services or support, changes that are conceptual as to how end-users perceive use of the product as it relates to the larger organization (Genc & De Giovanni, 2017). In the context of this study process innovation is the ability of data service providers to effect a change in routines and service methods, to create new and differentiated form of service offerings and products.

Product innovation strategies- It is the introduction of a new product or service; one in which consumers are not yet familiar with or the introduction of new functions, enhanced performance or the addition of new features into the existing products (Zheng et al., 2021). In this study it was addressed as the ability of data

service providers to reconfigure the internet service attributes and create innovative products through consumer-data service firm interface as central to creation of new products and services.

Technological innovation strategies- It is the execution of technique for an innovative product or service in the introduction of new components into a company's operations (Yang et al., 2018). In the context of this study, internet-based technology, presented by data service providers present new ways of creating value for the market through innovation techniques such as gaming, e commerce mobile technology, social media, and robotics

ABSTRACT

Several studies on innovation concepts, consequences and strategies have been published, primarily because innovation is commonly believed to be an integral antecedent of organizational performance. The spectacular growth of the internet, globalization of business and evolution of information economies has resulted in novel digital innovations, business processes and new ways of sharing knowledge. In the recent years, there has been emergence of service firms providing internet data service to consumers in Kenya. The data service industry has been characterized by singular dominance of one to a few firms while others keep losing market share and exiting the market scene. This has been so despite rollout of new spectrum of internet technology that can expand data services to create new revenue-generating opportunities. In this respect, there is emerging consensus that the role of Data Service Providers should transcend mere provision of data services but evolve to create new range of desired products and services. Therefore, the main objective of this study was to assess the effect of innovation strategies on performance of data service providers in Kenya. Specifically, this study sought to examine the effect of process innovation strategies, product innovation strategies, market innovation strategies, technological innovation strategies and to determine moderating effect of entrepreneurial orientation on the relationship between innovation strategies, product innovation strategies, market innovation strategies, technological innovation strategies on the performance of data service providers in Kenya. The study draws from five theoretical frameworks Schumpeter theory of innovation, diffusion of innovation theory, open innovation theory, disruptive innovation theory and Resource based view theory. The study employed a descriptive research design and was guided by positivism philosophy. The study targeted 316 managers of Data Service Providers in Kenya. A representative sample of 177 was obtained by use simple random sampling. Primary data was collected using a structured questionnaire which was pilot tested to ascertain reliability and validity before the actual data collection. Data was analyzed using the statistical package for social sciences (SPSS) version 26.0 where descriptive statistics (percentages, mean, standard deviation) and inferential statistics were used. The findings were presented using figure and tables. The study findings revealed that process innovation strategies, product innovation strategies, market innovation strategies, technological innovation strategies influenced performance of data service providers in Kenya. Additionally, the study concluded that entrepreneurial orientation had a significant moderating effect on the relationship between innovation strategic and performance of data service providers in Kenya. The study concluded that, innovation strategies are integral in stimulating performance of data service providers in Kenya. Moreover, it concluded that through embrace of entrepreneurial orientation, the firms strengthen their ability to be innovative thus enhancing their performance. The study recommends adoption of innovation strategies in the context of listening to customers' opinion as helping tool in customizing value innovation which can be furthered by altering service products, process and personnel structure to meet customers' special needs in specific use situations. The study recommends adoption integration of entrepreneurial orientation as a key catalyst to the effectiveness of innovation strategies towards enhancing firm performance. The study findings provide qualitative empirical support for theoretical claims of the effects of innovation strategies on performance of Data Service

Providers.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Achieving high performance and competitiveness levels in an organization may be highly affected by input of innovation strategies (Jové & Segarra, 2018). In recent years, this realization has become more evident especially after the shift from traditional industry to an economy based on information and hyper-connected world where nothing seems too far, virtually. This was not always so. An unprecedented convergence over the last decade has cultivated extreme automation and hyper-connectivity, as part of the knowledge-based global economy (Laudien & Pesch, 2019).

The confluence of several trends, including the increasing migration of socio-economic activities to the Internet, can spur new industries, processes and products, thereby creating significant competitive advantages (Laudon & Laudon, 2016). The spectacular growth of the internet, ubiquity of networking, globalization of business and evolution of information economies has resulted in novel business processes and new ways of sharing knowledge (Fielt et al.,2018). In this respect, there is emerging consensus that data service providers can be a strong citadel providing avenues through data services for innovation activities. Therefore, the role of data service providers should transcend mere provision of data services (Siegel & Dorner, 2017). This sheds the light on the importance of examining the extent to which data service providers can enhance the role that innovation strategies play in galvanizing organizational performance.

Innovation is considered a critical strategic ingredient by most firms and is considered to have a direct effect on organization performance (Gatto, 2016). The ability to innovate has been seen as a key competitive tool in the dynamic-progressive economic environment since the Schumpeterian time Edwards-Schachter (2018) note that, achievement of high performance and competitiveness levels in an

organization may be highly affected by innovation capabilities and that continuous innovation is required to create a new advantage. Innovation is not an isolated activity but the result and driver of growth, and collaboration for increased performance (Pantano & Viassone, 2016). The linkage to performance is important because paybacks for innovation strategies have received attention (Adams et al., 2019)

Taking cognizance of extensive review of literature, and as viewed by (Hanifah et al., 2019) innovation is viewed as a multi-stage process in which ideas are generated and transformed by organizations into new or improved products, services, technologies and processes that benefit the firm and its stakeholders through increasing its competitive position and differentiation in the marketplace. Indeed, Ayllón and Radicic (2019) state that innovation relates to the development, adoption and exploitation of value-added activities in economic and social areas; a key factor for competitiveness and growth. Cozzarin (2017) consider innovation as the incorporation of new technologies aiming to increase the competitiveness and added value of the organizations in the market. On the other hand, Tidd and Bessant (2018). present innovation as the development of something new that adds value, affecting positively the performance of companies.

Cozzarin, (2017) agree that innovation is the production of new products, services, production and organization methods that are new to the company and to the market while Haneda and Ito (2018) entrench a grasp of innovation by suggesting that innovation is a multi-dimensional phenomenon and at the firm level incorporates the behaviors and interactions of individuals and various organizational factors. The convergence of these definitions conclude that innovation is the art of generating ideas that are transformed by organizations into new or improved products, services, technologies and processes.

The overwhelming response from scholars and practitioners in the overarching fields of innovations strategy, testifies to the apex position of innovations as a sure pathway to competitive advantage. To this end, Ferreira *et al.* (2020) postulate that innovations constitute an indispensable component of the corporate strategies for

reasons such as to apply more productive processes, to perform better in the market, to seek positive reputation in customers' perception and as a result to gain sustainable competitive advantage. In line with this observation, Mongkol (2021) agree that innovation has great commercial importance due to its potential for increasing profitability and therefore, innovation plays a significant role in creating differences of performance and competition among firms, regions and even countries.

The value of innovations, is regarded as a game changer not for a certain business sector but as a solid basis for competitive advantage, in a rapidly changing international business environment, enhancing capabilities for sustainable business growth, economic activity and the wealth of nations (Antonioli & Montresor, 2021) At the end of spectrum, countries may obtain advantages in terms of competitiveness, job creation and income (Nguyen & Harrison, 2019). Innovation is therefore, a "desired achievement of society, capable of offering real conditions for the improvement of human needs" (Saide & Sheng, 2020). Moreover, Karabulut and Hatipoğlu (2020), posit that in the highly turbulent worldwide business environment, innovation leads to successful enterprises and thus creating a unique competitive position, for superior business performance. In congruence, Ebrahimi *et al.* (2018), affirm that maintenance of competitive advantage is achieved through continuous innovation and improvement of the product and processes. Jin *et al.* (2019), noted that innovation has not only opened up new opportunities for the sector, but also increased new market players arising from new products in the market and thus innovativeness is one of the fundamental instruments of growth strategies to enter new markets (Chesbroug et al., 2021), to increase the market share and to provide ventures with a competitive edge.

In today's increasingly dynamic, complex and unpredictable business environment, service organizations and industries, value-added service providers and non-tangible goods providers (Ndubisi & Nataraajan, 2016) try to renew themselves and add value through innovation activities. For innovation activities to be meaningful, innovation sense making can only yield within adoption of certain innovation strategies. Innovation strategies are therefore a standpoint for improvements in the financial

performance of firms and important factor for organization's sustainable firms' performance (Hansen & Nybakk, 2016). Besides, Innovation strategies are capable of creating organizational direction by charting the course of the firm's effort, by focusing efforts through promoting coordination, in providing people with an easy way to understand the organization and by providing consistency and reducing ambiguity, (Hansen et al., 2017).

Conversely, innovation strategies face challenges in this modern business era (Teece, 2017). With globalization, the increased focus on the customer, high number of competitors, economic changes, interconnectivity between markets and technological changes, organizations are forced to rethink their traditional models and develop new business formats to gain competitive advantage (Mikalef & Krogstie, 2020). In this vein, there is need to rethink of innovation strategies to enter new markets or increase the market share, aiming at the launch of new products or services and the development of new processes or new organizational configurations (Von et al., 2017) This is because, in the midst of continuous market changes, business strategies exist within turbulent environment characterized by rapid evolving technologies and changing customer preferences, yet these strategies on innovation management are key factors for gaining competitive advantage and distinction in the business environment (Bashir, 2018). About this, DaSilva (2018) warn that business strategies can go against managerial beliefs about success factors in the industry, resulting in strong opposition to business model innovation. Thus, managers should be intentionally aware that as business environment changes, the components of customer value are likely to change (Hansen & Nybakk, 2016). As a result, valuable experience creation can be achieved through innovations based on the interactions with the consumer that often requires that firms anticipate future customer needs and the market dynamics.

It is expected that firms that uphold innovation activities have a better performance than others concerning market value return (Schiavi & Behr, 2018).) or profit distribution (Mamoghli et al., 2018). Financial performance refers to the measurement of the results of a firm's strategies, policies and operations in monetary terms (Taouab, & Issor, 2019) According to Hamdan (2018) these results are

reflected in the firm's return on assets and return on investments. Performance provides a subjective measure of how well a company can use assets from its primary mode of business and generate revenues, (Barney, 2020). What follows is that, external parties normally evaluate a firm's ability based on its performance (Soares & Perin, 2020). This implies why performance is like a mirror to a firm. The level of goal accomplishment generally defines a firm's performance (Yoon & Chung, 2018). Institutional investors hold shares on the behalf of millions of individuals and other entities, and they have a fiduciary duty to ensure that their holdings are in the best interest of the underlying investors (Fowowe, 2017). But this responsibility doesn't end with seasonal financial performance; rather, performance in progressive continuum (Raza et al., 2018) extends to ensuring that the companies they invest in have assured organization culture of performance. The antecedents of firm performance hinges on continuous innovation to create new advantages that leads to a sustainable cycle of sound performance (Anning-Dorson, 2018). Findings suggest that innovation strategies are master key for innovation capability which is the most important determinant of overall firm performance (Ahmad & Zabri, 2016). It therefore motivated this study to assess whether innovation strategies were as well essential drivers of performance among data service providers in Kenya.

1.1.1 Global Perspective of Innovation Strategies

Innovation has become much more strategic than ever before for the growth of China as well its global societal upgrade (Wang et al., 2019). The Chinese authorities have designed an innovation strategy to face new economic and social challenges (Fibitz, & Ulrich, 2018). By 2016, the overarching evidence of innovation strategy was found in China's becoming the world's largest manufacturing nation (19.8% of the world manufacturing output) bypassing the US (19.4 %), thus ending its 110 year-run as the largest producer of goods (Wang et al., 2019). Evidently, the products of well thought innovation strategies worked fruitfully after joining the WTO in 2001, when China's growth during its golden period (2002-2007) was driven mainly by fixed asset investment and exports (Liao et al., 2018), whose average annual growth rates were respectively 29 and 24 percent. Following the spread of the US financial crisis around the world, the fall of global demand revealed China's high export

dependency (Salim et al., 2016) an aggressive strategic pro-export strategy that catapulted China into a strategic advantage position over United States. Meanwhile, the government's stimulus package, a strategic innovation strategy, based on expansionary fiscal and monetary policy to maintain economic growth, raised the investment rate from 25 % to 46 % of GDP from 2011 to 2020 ((Sethibe & Steyn, 2016).

In Brazil, great strides have been made in developing its innovation system to enhance the effectiveness and efficiency of both public and private companies (De Oliveira et al., 2018). Brazil is Latin America's largest and most innovative economy, with about 1 percent of its GDP going to R&D in 2000-03 (Saur-Amaral et al., 2018). However, most of Brazil's R&D is coming from the public sector, with the private sector scoring and advancing on a specialization path that requires little investment in R&D. The comparatively low number of patents awarded to Brazil is a reflection of the low commercialization of innovation. Domestic patents are predominately granted to state-owned or semi-public enterprises (Sethibe & Steyn, 2016), rather than the private sector. Only in a handful of industries, e.g. aerospace and deep-sea drilling, Brazil's innovative capabilities are able to compete with industrialized countries. Observably, there are a growing number of technology-intensive, highly-productive small and medium businesses that invest heavily in innovation (Heikkilä, et al., 2018).

Malaysia on the other hand has strategically emphasized innovation as the key factor for greater growth and recognizes the importance of innovation as the catalyst for the country's long-term success and the significance of innovation as the impetus in achieving Malaysia's Vision 2020. With an eye on Malaysia, Kranich and Wald (2018) and Heaton, Hafeez-Baig, & Gururajan (2019) suggest that countries need to setup reform programs like in Malaysia to improve the industry's performance where one of the goals of the programs is to enhance innovation. The Construction Industry Development Board (CIDB) in Malaysia echoed this notion by underlining innovation as one of the strategic thrusts in the Construction Industry Malaysia Plan (CIMP), aiming for industry's superior performance (Pati et al., 2018). The CIMP that strategizes industry's goals for the year 2006 to 2015 denotes the importance of

innovation through research and development and through adopting new construction methods (Spruijt, Demouge, & Hogeschool, 2018). Malaysia's aim of becoming a developed country and a high-income economy status by the year 2020 is seen as being realized due to emphasis towards the industry's improvement and greater performance through innovation (Yildiz et al., 2021).

Focusing on innovation strategies, many companies have started to grasp the importance of strategies due to motivation by the increasing competition in global markets (Branstad & Solem, 2020). In fact, swiftly changing technologies and severe global competition rapidly erode the value-add of existing products and services (Storbacka, 2019). In this sense, it can be understood that the introduction of continually constructive innovation strategies by managers is an effective way to disrupt market leaders by making advancement in new business models (Howson & Davies, 2018). Thus, managers must assume an entrepreneurial behavior and analyze the business beyond their traditional perspectives, looking for new ways of creating and capturing value through new strategies (Bashir, 2016).

The overall innovation fruition provided by the new technologies reflect positively on the performance of the companies, allowing competitive advantage (Zuo et al., 2019). Nevertheless, in the observation of Willoughby and Mullina (2021), in achieving competitive advantage, companies need to be concerned with the adequacy of their market strategies in relation to the new technologies. Successful technological companies equally focus on market pull strategies in order to have long-term commitment to understand customer needs, and thus develop innovative solutions by discovering hidden customer needs and new markets (Bach, et al., 2019). Market pull strategy is an organization wide generation, translation and interpretation of customer and competitor related information to provide products of superior value and stay at the top of the competition (Sprong et al., 2021).

Market pull approach signal for development starts from the expressed market need (Muharam et al., 2020). In what follows, from strategic management perspective, both the technology push and market-pull strategy strive for the achievement of superior innovation performance through the development of organizational

competence (Hacioglu, 2019). Proponents of the market-pull innovation strategy argue that for better performance, organizations need to stay close to the customer they serve and the competitors they are engaged with (Aksoy, 2017). Supportive of this idea is Anning-Dorson (2018) who state that organizations that deliberately focus on the external environment (the market) as the source of their innovation ideas will learn better and outperform their counterparts.

Summing up, technological revolution has recently created huge appetite for innovations based and driven by information technologies and modes of communication in our contemporary society (Adeyeye et al., 2019). Organizations are rapidly embracing the internet as means to whet this innovation appetite (Lu et al., 2021) and as (Shankar & Narang, 2020) see it, managers are trying to gain an immediate understanding of the importance of and place for the Internet in their organization. To the core data service providers, the Internet is a technology innovation. The evolution of internet has brought about an intelligent exchange of information between objects, enabling the creation of a new range of products and services in the real and virtual worlds (Sánchez-Alcon, 2015). Therefore, the process of globalization and the insertion of new information and communication technologies in the market has pressured the corporate ecosystems in such a way that society now lives in a paradigm in which consumers no longer control the time, duration and place for computer use; now processing is in real time and scattered in the environment (Goos et al., 2019). These are great opportunities for data service providers.

Tomat, and Trkman (2019) observe that, many data service providers have emerged focused on emerging technologies to provide the steady supply of new products, services and processes aiming to meet demands of the growing online marketplace. Thus, for data service providers, competition between these products in the market can offer several ways to differentiate services and add value, which benefits consumers (Faghih et al., 2018). These provides inference that innovation strategies are key to establishing a market entry strategy that can maximizes technological advantage in accessing highly competitive markets with rapidly evolving technology (Teece, 2017).

1.1.2 Regional perspective of Innovation Strategies

In recent decades, African countries have re-embraced higher education as a key instrument for national and regional development in a knowledge-based economic world order (Bailey, 2012). A distinctive and growing emphasis on knowledge production, scientific innovation, and closer convergence between research and sustainable development has been observed across many African countries (Obamba, 2013). Studies have been done providing captivating overviews of the current landscape of research and innovation as well as the existing institutional and policy arrangements for the governance of research and innovation in some of the African Countries, (Bailey, 2012). In particular, as Obamba, (2013) posits, most studies have focused on the policy environment for research and innovation at the governmental level; the funding and governance context of research within institutions; as well as the growing importance of internationalization at national and institutional levels.

Studies have affirmed that enviable performance of firms is rooted in innovation strategies. In Nigeria, Ibidunni, Iyiola and Ibidunni, (2014) expounded on how product innovation, as a strategy, enhances the survival of the small and medium enterprises. The research findings revealed that there was a significant relationship between product innovation and the survival of SMEs, also, that changes in tastes and preference of consumers necessitate product innovation, and that product innovation increases sales volume of SMEs. The conclusion from the research finding showed that there is need for SMEs to carry out research on product innovation in order to meet and fulfill the demand and expectations of all consumers and the market. The research recommended that adequate finance, a conducive environment, and public policy framework should be developed by the Nigerian government to support and encourage the SMEs.

In Ghana, Dorson, (2015) analyzed how innovation in firms can be developed and implemented under different conditions to produce long-term benefits for service firms. The study findings revealed that customer demand, regulatory regime, competitive intensity, organizational culture and leadership determine service innovation propensity in service firms. In addition, the study found that service

innovation is directly related to a firm ‘s performance, and that it is rather high levels of service innovations that maximize performance in service firms. Further, service innovation, as a strategy was found to be the capacity that yield maximum output when environmental conditions are aligned to the implementation.

In East Africa, Uganda launched the Comprehensive National Development Planning Framework (CNDPF) which provided for the development of a 30-year Vision to be implemented through a mixture of short-term and longer-term National Development Plans (NDPs) and Sector Investment Plans (SIPs) at local and national levels. Pieced from (CNDPF) is the country’s Poverty Eradication Action Plan that emphasizes university participation in national development either directly or indirectly through innovative teaching, research, and community engagement (UNCST, 2011), stating that education contributes to the accumulation of human capital, which is essential for higher income and a sustained economic growth.

1.1.3 Local Perspective of Innovation Strategies

In Kenya, technology and innovation has been identified as central to the development of the existing economic sectors as well as the creation of new ones with high growth potential. Technology and innovation have been identified as a critical foundation for Vision 2030, long term economic plan that is set to guide the economy into a globally competitive and prosperous one (Republic of Kenya, 2008).

In order to realize the above, the Government has committed itself to facilitate the identification, acquisition, transfer, diffusion and application of relevant technology and innovation knowledge in all sectors of the economy. In this regard, the Government seeks the concerted and supportive efforts by all stakeholders in the Kenyan national innovation system to re-engineer structures, institutions and sectorial policies or successful implementation of the technology and innovation policy and strategy (Republic of Kenya, 2010). The national system of innovation in its broadest conception is the means through which Kenya seeks to acquire, exploit and diffuse knowledge for the achievement of individual and collective goals. The accuracy and effectiveness of the national system of innovation will depend on how

well knowledge, technologies, products and processes are converted into increased economic growth for improved quality of life (Republic of Kenya, 2008).

In Kenya, the Medium-Term Expenditure Framework Report provides a useful but more specific breakdown of the actual expenditures attributed to the Research Innovation and Technology Sector. The estimates show that total recurrent expenditure by Research Innovation and Technology (RIT) sector increased from nearly KES. 22.5 billion in year 2007/08 to approximately KES 38 billion in 2009/2010 financial year; representing a growth of 69% in sectorial expenditure. For the financial year 2011/12, the RIT Sector was allocated a total of KES 44.2 Billion to finance recurrent and development expenditures.

The 2010 African Innovation Outlook (NEPAD, 2010) shows that Kenya's gross expenditure on research and innovation exceeded KES 7.6 billion during 2007/2008. If converted into comparable Purchasing Power Parity, the expenditure levels translate into approx. US$90 Million, which means that Kenya spent 0.48% of its GDP on Research and Development. However, the most significant indicator of the Kenya Government's commitment to the mainstreaming of STI and knowledge in its development policy management is embodied in the establishment of the fully-fledged flagship, Research Innovation and Technology (RIT) Sector during 2008/09 (Republic of Kenya, 2017).

Along the pathway of Research Innovation and Technology initiated by the government, Kenya has been home to several major technological innovations hitherto. These innovations are characterized by for instance: An agile mobile banking system that has created new market opportunities for digital entrepreneurs, 3G internet connections and recently 4G internet connections that have become more and more affordable. Statistical information from the International Telecommunications Union (ITU) has shown that great strides are being made in expanding Internet access and usage through the increased availability of broadband networks (CAK 2019). With digital connectivity playing an important role in transforming and improving lives, as it opens the door to employment, financial opportunities, it has become a platform for locally developed but globally recognized

technological innovations like mobile phone-based money transfer, 'M-Pesa' incorporating, financing and micro financing services, launched in 2007 (CCK, 2018).

According to CAK (2018), the mobile service industry is the fastest growing sector in terms of innovation breakthroughs. It is quite huge and growing rapidly. As expected, consumers of mobile services have increased significantly, and the number of mobile services in the market has reached new heights. This growth is mainly driven by the major developments witnessed in mobile payments, cloud computing, Internet of Things (IoT), and mobile applications markets fueled by increased network expansion in the country.

1.1.4 Entrepreneurial Orientation and Innovation Strategies

Entrepreneurial behavior can be catalyzed at the level of the business enterprise, by the reliance of the entrepreneur on the skills and efforts of other stakeholders in the exercise of innovative ideas generation, strategic control, and the management of organizational integration (Cho & Lee, 2018). Taking this argument into account, the crystallization of entrepreneurial orientation becomes critical at this stage (Wales, 2016). Expanding on this, (Hossain & Al Asheq, 2019) aver that entrepreneurial orientation in a wide sense is believed to have a major influence on innovation strategies in an enterprise. McKenny et al. (2019), describe entrepreneurial orientation as business model applied to firms that regularly innovate in decisions, taking risks in their strategies by relying on the entrepreneur, on the skills and efforts.

Randerson, (2019) has emphasized entrepreneurship as the primary act underpinning innovation and view of entrepreneurship, as the primary catalyst for innovation. Other scholars for example, (Putniņš & Sauka, 2020) argue that innovation and entrepreneurship are positively related to each other and interact to help an organization to flourish. All of these views are relevant in building conclusion that innovation is a process-wide act incorporating entrepreneurial behaviors of firms' employees. Moreover, innovation comprises dynamic and holistic processes where individual behaviors and organizational factors are crucial factors affecting the

development of entrepreneurial and innovation behavior in an organization (Eshima & Anderson, 2017). This means that innovation, motivated by entrepreneurship can provide direction to the company's entire operation, serving as an integral component of a firm's strategy, and possibly as the core component of corporate strategy (McGee, & Peterson, 2019).

While innovation strategies driven by entrepreneurship have been identified as the platforms of business opportunities, organizational transformations have equally benefited from the agility of new technologies, providing for development of new ways of creating value for the market through innovation processes (Azar & Ciabuschi, 2017). This has become so especially in technology-based service industries like data service providers where competition can move very quickly with new players entering the market easily (D'Attoma, & Ieva, 2020). In this industry, firms with policies that support talent, knowledge transfer and increased R&D spending are well positioned to reap great performance in the global scene (Coccia, 2017).

Companies in dynamic industries like the Data Service Providers (DSPs) that outwit other prospects such as Entrepreneurial Orientation (EO) and respond with innovative approaches will outperform those that don't in performance. In data service industry, a marriage of innovation strategies and emerging technologies play an important role in new business strategies (Bashir, 2016), as they create business opportunities. In this context, managers' ability in recognizing the innovation possibilities in new technologies is paramount (Broughel & Thierer, 2019). In so doing managers can help companies to react by realigning its products or services, processes, skills and value network relationships (Mensah et al.,2019). According to Omri, (2020), this reaction can enable the company to be ready to seize opportunities since survival in this market requires revamped and continuous innovation strategies. This appears to be precisely what data service providers, in particular, have begun to do in recent years.

In understanding the entrepreneurial oriented environment of technology-based service industries, like data service providers, Opazo-Basáez et al. (2022) argue that

innovation possibilities in such an industry, can tend to be subjective to a system of factors like: the managers' innovation abilities, the managers' decision-making and firm's aggressive or conservative posture in the market. There is argument that innovations are strongly seen to be guided by leaders and managers of innovating firms (Campanella et al.,2017). These firms have room for the development of innovation because they enter the market with new ideas for new and robust technology and processes, and with strong attitude towards the innovation chain (Zhang et al.,2019).

According to Markard (2020), innovation prevails in technology-based companies, since they are organizations that apply scientific and technical knowledge for the creation of innovative products. They make significant technological efforts and develop new ideas for products, processes and services; consequently, they generate and depend on innovation (Liu & Dong, 2021). The success of the innovation in these companies, however, is based on their ability to be entrepreneurial in nature by taking risks, upholding proactiveness and being competitive aggressive. It has been affirmed that innovations based on internet platforms are the fastest growing form of innovations in the word (Baraldi & Havenvid, 2016). Data service providers therefore have incessant innovation possibilities. Through innovation strategies and with the embrace of EO, companies have proved to generate more revenue and be more competitive. To this effect, it was imperative to assess how entrepreneurial orientation moderates the relationship between innovation strategies and performance of data service providers.

1.1.5 Data Service Providers in Kenya

Data service providers are enterprises that provide access to the Internet. A data service provider (DSP) is an organization that provides a user with internet access via some sort of connection. Traditionally, this connection was always a telephone line, although faster digital technologies such as cable and DSL (A digital subscriber line or modem) and routers have appeared in recent years. DSPs sell bandwidth to internet users and assist organizations and individuals to get connected to the internet. Therefore, organizations or individuals wanting to access and explore the

myriad resources and services of the internet have to be connected to the net before they can take advantage of it. The cable service providers offer triple play services like internet, TV and telephone all on one cable once they connect their respective clients (OECD, 2011). Internet Service Provider offer services such as Internet access, Internet transit, domain name registration and hosting, dial-up access, leased line access and server collocation. Internet service providers may be organized in various forms, such as commercial, community-owned, non-profit, or otherwise privately owned.

Since data service providers innovation strategies are more based on the technology assets or skills they possess, their drive is to push the new technology to market and create winning strategy by being the first to deploy that technology or the one deploying the most advanced technology in the ongoing race of technology innovations (Campanella et al., 2017) Therefore, data service providers can succeed by pursuing technology push innovation strategies (Wang & Wang, 2020) in their new product generation and development process.

Technology push is a term used for the approach in which the technology innovation is pushed to the market starting from internal development via production to marketing function (Islam et al., 2022). According to Aljanabi (2018), firms pursuing technology push strategy usually allocate enough R&D resources, acquire new technology, and accumulate better human resource competence. The study avers that such capabilities and competences are hard to be imitated by competitors and have considerable long-term effect on the strategic product innovation performance. In fact, recent research findings by (Zuo et al., 2019) indicate that technology push innovation strategy helps organizations to build better confidence and enable them to exploit the knowledge in their external environment easily. Data service providers can therefore focus on emerging technologies provide steady supply of new products, services and processes that can end up influencing business and market structures.

Recently, the evolution of internet has brought about an intelligent exchange of information between objects that enables the creation of a new range of products and services in the real and virtual worlds (Sánchez-Alcon, 2015). Interestingly, the

original, internet's intention was to carry information to anyone, anywhere, anytime, but currently "anyone" has been replaced by "anything" (Eisenberg & Fullerton, 2012). It is sufficed to say that solutions are extending to all areas of everyday life, including, the intelligent industry, intelligent manufacturing systems, smart homes and intelligent transportation (solutions that include fleet tracking, mobile ticketing, mobile money transfer etc. (Worthmann & Flüchter, 2015). IoT (Internet of Things) has strongly influenced changes in businesses and in the whole society. Its expansion will affect consumers, companies, governments and hospitals, among other users (Said & Masud, 2013). According to Rivera and Meulen, (2014). Internet of things (IoT) is a broad term that describes network connectivity to physical objects. These are called connectable or intelligent objects, and are embedded in electronic circuits and software that enable them to detect, collect and transmit data and information (Hancock & Hancock, 2016). In continuum, Porter and Heppelmann, (2014) describe the value of (IoT) as range of innovations in technologies that is turning them into intelligent objects with economic attractiveness (reduction of electricity consumption, higher efficiency of sensors and batteries, low-cost products and wireless network, among others.) In a society where people can choose the electronic devices they carry most of the time, IoT objects can bring many advantages. And therefore for data service providers, competition between these products in the market can offer several ways to differentiate services and add value, which benefits consumers.

Mobile money transfer, online cabs booking involving peer-to-peer ridesharing are off-shoot examples of internet based innovation practices associated with some Kenyan data service providers. The data service industry is a typical example of technological sector that can heavily rely on evolving technological evolution and heavily invest in offerings, platforms, networking and customer experience innovations. In Kenya a cross section of data service providers includes; Safaricom Limited, Wananchi Telecom Limited, Liquid Telecom, Airtel Kenya, Access Kenya Limited, Jamii Telecommunication Limited, Swift Global, Call Key Networks Limited, Tangerine Limited, Pwani Telecomms and Other fixed/Terrestrial operators.

1.2 Statement of the Problem

Data-driven innovation forms a key pillar in strategic sources of firm performance, particularly in the modern dynamic operating environment (OECD, 2019). The confluence of several trends, including the increasing migration of socio-economic activities to the Internet and the proliferation of endless innovation opportunities through use of internet has put data service providers on the spot. While Africa's growth in internet access and data services has been rising faster over the last decade than any other region of the world, the continent is still playing catch-up. It still has the lowest percentage of population accessing the internet, at only 15%, with only less than a third of the population in Africa having access to broadband connectivity (World Bank, 2019).

In Kenya, there has been concern on the performance of Data service providers due to glaring and varying performance of firms in the industry (CA, 2019). Despite the great potential of the data service market in Kenya, observable performance gaps conspicuously exist among individual firms. For illustration, Communications Authority of Kenya report for the end of financial year 2019/2020 showed that Safaricom Limited recorded the highest market share for mobile data subscriptions standing at 68.7 per cent. Airtel Networks Limited and Orange Kenya Limited market shares stood at 26.0 per cent and 5 per cent respectively while that of Finserve Limited was recorded at 0.4 per cent. (Communication Authority of Kenya, 2020). Looking ahead, in 2020/2021 review, the market share for Safaricom Kenya Limited in mobile data/Internet subscriptions stood at 67.5 per cent. Airtel Networks Limited recorded a market share of 26.8 per cent while Telkom Kenya Limited posted a market share of 5.4 per cent. Finserve Africa Limited market share stood at 0.3 per cent (Communication Authority of Kenya, 2021). This indicates a near insignificant change in market share trajectory. Agreeably, this trend raises pertinent questions on the individual performance of majority of the firms pointing to lack of innovation strategies

Although the internet service industry has been growing exponentially without exception to Kenya, there has been performance below potential within the Kenyan

market for commercial data services in Kenya compared to other nations. Population coverage of 4G networks is still far from universal (Oteri, Kibet, & Ndung'u, 2015). This is despite the fertility of business-environment augmented by Kenya's political devolved system of government in which the government of Kenya is building new set of county-governments from scratch. Moreover, despite the landing of the cables, there is significant scope for retail broadband to take off. Conversely internet and broadband services provided by Data Service Providers (DSPs) including mobile operators have been expensive. It is therefore clearly evident that, the data market has yet to fully exploit its potential and the beneficial effects of radical innovation strategies.

A review of existing literature shows that despite the glaring importance of innovation strategies as a catalyst for firms' performance, innovation strategies on performance of data service providers has not received empirical focus. Karabulut (2015) focused on effects of innovation strategy on firm performance of manufacturing firms in Turkey and revealed that technological innovation, market innovation and product innovation had integral role to play in enhancing firm performance. Iberahim and Ismail (2015) explored the relationship between innovation and organizational performance in the construction industry in Malaysia and found out that process, product and market innovation significantly influenced firm performance. Liao, Fu, and Liu (2020) while addressing the effect of innovation strategies on firm performance revealed that only product innovation had a significant effect on performance. In Kenya, Ndungu, and Moturi (2020) aimed to identify the determinants that influence uptake of mobile financial technology (Fintech) and propose an appropriate model for uptake of mobile Fintech within the sector. This study established that technology factors, environmental characteristics and organizational factors have a strong influence on the uptake of mobile Fintech. These factors include technology availability, perceived technology benefits, organization size, resources availability, and competition, regulatory and legal environment. The uptake of mobile Fintech was found to reduce operation costs and improve business operations efficiency. Chege *et al.* (2020) established that technological innovation had a significant effect on firm performance, and Kiveu, Namusonge, and Muathe (2019) while focusing on manufacturing SMEs in Nairobi

County revealed that product, process and market innovation had significant influence on firm performance. Based on the evidence from the reviewed empirical studies, it is evident that innovation strategies are integral in enhancing firm performance. However, most of these studies conceptualize innovation strategies in a varied manner, where some only focused on product and process innovation. The present study fills this gap by conceptualizing a mesh of innovation strategies in form of market, technological, process and product innovation. Moreover, the studies have focused on varied contexts, where some of the local studies have focused on banking and SME industries which operate in different market segment as compared to Data Service Providers. Other studies have showed varying levels of significance among the innovation strategies in regard to influencing performance. Moreover, despite the emphasis on entrepreneurial orientation in stimulating the effectiveness of innovation as described by Schumpeter, most of the reviewed studies have overlooked the role played by entrepreneurial orientation in innovation strategies. This study aimed to fill the overarching empirical, contextual, conceptual and methodological gaps by assessing innovation strategies on performance of Data Service Providers in Kenya and the moderating role of entrepreneurial orientation.

1.3 Objective of the Study

1.3.1 General objective

The general objective of this study was to assess the effect of innovation strategies and the moderating effect of entrepreneurial orientation on the performance of data service providers in Kenya.

1.3.2 Specific Objectives of the Study

1. To examine the effect of process innovation strategy on the performance of data service providers in Kenya
2. To establish the effect of product innovation strategy on the performance of data service providers in Kenya
3. To determine the effect of market innovation strategy on the performance of data service providers in Kenya

4. To assess the effect of technological innovation strategy on the performance of data service providers in Kenya
5. To determine moderating effect of entrepreneurial orientation on the relationship between innovation strategies and performance of data service providers in Kenya.

1.4 Research Hypotheses

H_{01}: Process innovation does not have a significant effect on the performance of data service providers in Kenya

H_{02}: Product innovation does not have a significant effect on the performance of data service providers in Kenya

H_{03}: Market innovation does not have a significant effect on the performance of data service providers in Kenya

H_{04}: Technological innovation does not have a significant effect on the performance of data service providers in Kenya

H_{05}: Entrepreneurial orientation does not moderate the relationship between innovation strategies and the performance of data service providers in Kenya.

1.5 Significance of the Study

The findings of this study will be beneficial to the following groups:

1.5.1 Data Service Providers

Innovation is considered a key strategic element by most organizations and is considered to have a direct effect on organization performance. The study findings can be useful to data service providers in pointing to the combinations of innovation strategies that the firms can use to reap maximum competitive advantage and to attain increased performance. The study findings may also help the firms to gauge a palpable fit between appropriate innovation strategies and growth in the turbulent-

competitive environments. Further, the findings can be useful in guiding the firms to assess areas of weaknesses in the application of innovation strategies for continued performance improvement, not to mention that the study can guide firms in evaluating their entrepreneurial orientations in undertaking their operations and how these such entrepreneurial orientations can change requisite approaches for better performance.

1.5.2 Government and Policy Makers

The study findings may be beneficial to the government's agencies that are mandated to regulate the data service providers. For instance, the regulators particularly the Communications Authority (CA) may find this study useful in making informed policy decisions regarding the innovation strategies adopted by the firms in achieving high performance and competitiveness. The innovation strategies adopted by the firms should be in line with the legally set standards and therefore the findings of this study are crucial in enabling policy makers to streamline the existing policies on trajectories in data service provision stakeholders.

1.5.3 Potential Investors

Potential investors in the data service provision could also benefit from the study findings. Through the findings, they would establish the need for innovation strategies and how they can integrate entrepreneurial orientation to exploit the potential in data service provision industry.

1.5.4 Management Practitioners

Innovation strategies have an integral place in enhancing organizational performance. The findings would be useful to the management practitioners in other industries which also face performance challenges. The study may contribute to a better understanding of the factors that could influence the adoption and management of innovation resources for enhancing competitiveness level of firms. The practitioners will therefore gain knowledge on how to integrate innovation strategies and entrepreneurial orientation for enhanced performance of their respective entities.

1.5.5 Scholars and Researchers

This study can be an apex that is crucial in enhancing the existing scholarly work in the relevant field and specifically where the Kenyan perspective has not received an in-depth evaluation and hence these study findings may act as a reference point for other scholars who wish to pursue further research in this area. The study findings can also provoke various areas for further research.

1.6 Scope of the Study

The study aimed at assessing innovation strategies and performance of Data Service Providers in Kenya. The content scope of the study was the four main innovation strategies which were; process innovation, product innovation, market innovation and technological innovation which were informed by the Schumpeterian theory of innovation, as well as the moderating effect of entrepreneurial orientation and performance of the data service providers as the dependent variable. On geographical scope, the study focused on the 36 (thirty-six) Data Service Provider firms in Kenya which are mainly based in Nairobi County. The scope was limited to registered DSPs by the Communication Authority of Kenya. On the methodological scope, the study utilized a descriptive research design and targeted HOD managers of Data Service Providers (DSP) in Kenya registered by Communication Authority of Kenya. On the time scope, the study focused on the Data Service Providers that had been operational for a period of five years and above, and assessed performance and innovation strategies recorded in spectrum five years and above.

1.7 Limitation of the Study

The study has significant contributions to academic knowledge in support for theoretical claims of contribution of innovation strategies on performance of Data Service Providers in Kenya. However, the study experienced some limitation challenges. To start with, the limitations of this research is restricted to only those Data Service Providers registered under Communication Authority of Kenya. As a result, data collected is only relevant to this part of the total population. The other limitation of the study was difficulty in accessing senior managers of Data Service

providers. Junior officers would find it unnecessary to allow access their seniors for filling questionnaires. In mitigation, the researcher worked hard to build confidence that their seniors can fill questionnaires within an extended time frame. On the other hand, data was collected through self-report questionnaires, which can constitute a major limitation to construct validity. Additionally, the study encountered hesitancy of respondents in filling questionnaire due to such fears like information given might be revealed to competition or might contravene their organizational secrecy policy. The researcher, mitigated this by giving assurance that supposed information will be used for academic purposes only as assured by authorization of National Commission for Science, Technology and Innovation.

On the other hand, data was collected through self-report questionnaires, which may constitute a major limitation to construct validity. In addition, the questionnaires asked for information about the companies to be reported by senior managers working in the same companies. Moreover, the relationship between innovations, entrepreneurial orientation and performance can change and evolve over time, especially that entrepreneurship is all about change, and that innovations are considered catalysts of change.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter took a detailed review of existing literature related to the study. The chapter developed theoretical review, conceptual framework, empirical review that was used in the study in regard to each variable in the study. This provided a lead way in critique of the existing literature and identification of research gaps.

2.2 Theoretical Framework

Collins and Stockton (2018) define a theory as set of interrelated concepts, definitions, and propositions that present a systematic view of phenomena by specifying relations among variable with the purpose of explaining or predicting the phenomena. Formulation of theories is critical because theories explain, predict and understand phenomena and in many cases, challenge and extend existing knowledge within the limits of critical bounding assumptions (Adom, Hussein, & Agyem, 2018). As observed by Lederman and Lederman (2015), theoretical framework is the structure that can hold or support a theory of a research study. In congruence, Börner, Bueckle and Ginda (2019) assert that the theoretical framework introduces and describes the theory that explains why the research problem under study exists. A formal theory is syntactic in nature and is only meaningful when given a semantic component by applying it to some content (that is facts and relationships of the actual historical world as it is unfolding (Collins & Stockton, 2018). A theoretical framework consists of concepts together with their definitions and references to relevant scholarly literature, and existing theory that is used for a particular study. Theoretical framework demonstrates understanding position of theories and concepts that are relevant to the topic of research considerations and that relate to the broader areas of knowledge being considered. This study was based on the following theories:

2.2.1 Schumpeter Theory of Innovation

Schumpeter (1934) contended 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 (1934) as Kondratiev cycles, would emerge to begin the business cycle over again. Years later, Schumpeter (1942) when referring to the economic changes and replacing of products and process of the market and the industry, emphasized that the process of revolutionizing, destroying and creating a new economic structure, called “creative destruction,” is a fundamental fact for the capitalism must be continuous. In the beginning of the 1960s, Schumpeter (1961) describes innovation as major disruptions related to products, services and processes, representing a break with previous paradigms to generate wealth and differentiation.

Schumpeter argued that anyone seeking profits must innovate. That will cause the different employment of economic system’s existing supplies of productive means (Schumpeter, 1942) Schumpeter believed that innovation is considered as an essential driver of competitiveness and economic dynamics (Hanush & Pyka, 2007). He also believed that innovation is the center of economic change causing gales of “creative destruction”, which is a term created by Schumpeter in Capitalism, Socialism and Democracy. According to Schumpeter innovation is a "process of industrial mutation, that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one". In this vein, the study finds the theory informative to innovation strategies and performance of data service providers.

The concepts of innovation and entrepreneurship are probably Schumpeter’s most distinctive contributions to economics (Hanush & Pyka, 2007) One of the most common themes in Schumpeter’s writings was the role of innovation (“new combinations”) and entrepreneurship in economic growth. Despite the fact that

Schumpeter was first who lay out the clear concept of innovation his views on the topic changed over time. later, Schumpeter highlighted the function of entrepreneurs who carrying out new combinations. Schumpeter (1934) emphasized the role of entrepreneurship and the seeking out of opportunities for novel value generating activities which would expand and transform the circular flow of income, but he did so with reference to a distinction between invention or discovery on the one hand and innovation, commercialization and entrepreneurship on the other. This separation of invention and innovation marked out the typical nineteenth century institutional model of innovation, in which independent inventors typically fed discoveries as potential inputs to entrepreneurial firms. Schumpeter further saw innovations as perpetual gales of creative destruction that were essential forces driving growth rates in a capitalist system. This can be likened to the present era, innovation revolution driven by information technologies and modes of communication in our modern society (Sánchez-Alcon, 2015). In this way, the possibility of innovations on internet evolution can be seen as process of revolutionizing, destroying and creating a new economic structure, as asserted by Schumpeter (1942), enabling the creation of a new range of products and services in the real and virtual worlds). As such, Schumpeterian theory of innovation seem to guide innovations happenings in data service industry where endless innovation possibilities continue to exist.

Schumpeter described development as historical process of structural changes, substantially driven by innovation (Schumpeter, 1943) He divided the innovation process into four dimensions: invention, innovation, diffusion and imitation. Then he puts the dynamic entrepreneur in the middle of his analysis. In Schumpeter's theory, the possibility and activity of the entrepreneurs, drawing upon the discoveries of scientists and inventors, create completely new opportunities for investment, growth and employment. In Schumpeter's analysis, the invention phase or the basic innovation have less of an impact, while the diffusion and imitation process have a much greater influence on the state of an economy. The study finds this discovery supportive of moderation role of entrepreneurial orientation on innovation strategies and performance of data service providers. Schumpeter's view agrees with (Achtenhagen, 2020), who describe entrepreneurial orientation as business model applied to firms that regularly innovate in decisions, taking risks in their strategies,

whether in product or market. In congruence, Frank (2010) agree that entrepreneurial firm is “one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations,

One of Schumpeter’s most lasting contributions was his insistence that entrepreneurship is at once a unique factor of production and the rare social input that makes economic history evolve. In other words, innovation is the “creative destruction” that develops the economy while the entrepreneur performs the function of the change creator. In Schumpeter’s work entrepreneur is: “Carrying out innovations is the only function which is fundamental in history” (Khodaei et al., 2021)). Typical characteristics of entrepreneurs are: intelligence, alertness, energy and determination. Entrepreneurship is innovation and the actualization of innovation. Schumpeter’s theory of innovation has proved to be a powerful way of thinking about innovation strategies and entrepreneurial orientation and performance of data service providers.

2.2.2 Diffusion of Innovation Theory

Rogers’ diffusion of innovations theory is ideally appropriate for investigating the adoption of innovation strategies within parameters of product, process, market and technology. In fact, much diffusion research involves technological innovations so Rogers (2003) usually used the word “technology” and “innovation” as synonyms. Rogers offered the following description of an innovation: “An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption” (Rogers, 2003). An innovation may have been invented a long time ago, but if individuals perceive it as new, then it may still be an innovation for them. The newness characteristic of an adoption is more related to the three steps (knowledge, persuasion, and decision) of the innovation-decision process.

The theory of Diffusion of Innovations as initially described by Rogers (1995) is well known. Rogers describes diffusion of innovations as: “the process by which an innovation is communicated through certain channels over time among the members of social systems”. The theory explains how, over time, an idea or product gains momentum and spreads through a specific population or social system. The end

result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption in this case means that people do things differently than what they had previously e.g. purchase or use a new product. In this way, diffusion takes place by adoption of a new product or idea.

Adoption is first embraced by innovators who are characteristically venturesome and interested in new ideas (Rogers, 1995). Innovators play an important role in the diffusion of innovations. With other innovators they import new ideas into their social networks which make them have control over the flow of innovations between social systems. It follows that many individuals in the society are influenced by social network peers when choosing whether or not to adopt an innovation. Relationship from peers from distant social networks introduce innovators to new ideas and in continuum, the process gives the locally oriented early adopters access to these innovations. On the other hand, early adopters acting as opinion leaders, showcase advantages of an innovation to the early majority. Through peer pressure and out of economic necessity, the late majority and laggards finally also adopt the innovation. Therefore, the diffusion process of an innovation is driven by interpersonal communication. In this type of communication, messages are concerned with new ideas" (Rogers, 1995). A decision not to adopt an innovation relates to the rejection of the available new idea.

However, in order to explain the rate of adoption of innovations, Rogers suggests measurement of perceived characteristics of innovations such as: relative advantage, compatibility, complexity, friability, and observability. Rogers (1995) postulated that the adoption of innovations is influenced by these five characteristics, and that they can explain the rate of technology adoption. Internet/Data service industry is perceived to exhibit the said characteristics. Innovations in this industry is able to midwife business models that have such characteristics as universality, infinite scalability and continuous innovativeness, given its base on data.

Diffusion of innovations has been defined as a process by which innovation is communicated through certain channels to members of the social system over time (Sampaio, et al. 2012). The theory focuses on the fact that new ideas (innovations) or

technologies, are being created continually and that communication becomes vital in spreading or disseminating the innovation to society or communities. This is primarily because acceptance of the innovation or technology will depend on the individual's attitude towards that innovation. Also, communities have a choice in rejecting or accepting the innovation. The social networks or communication channels as an element of the diffusion of innovations process may be important in diffusion of innovation for data service providers. A channel is the means by which a message gets from the source to the receiver (Rogers, 2003). Mass media and interpersonal communication are two communication channels that are critical in diffusion since it is a social process that involves interpersonal communication relationships (Walton, 2013). Thus, interpersonal channels are more powerful to create or change strong attitudes held by an individual. The internet consists of a web of social systems that act as influencers in adoption of technology provided by the same channel or platform. Therefore, data service providers tend to provide data services in interpersonal channels, that have a characteristic of homophily, that is, "the degree to which two or more individuals who interact are similar in certain attributes, such as beliefs, education, socioeconomic status with a resulted end in adoption of products.

Zhang et al. (2015) suggest that Diffusion of innovation is one of the most prevalent theories to study the adoption of innovation and understand how innovations are diffused within and between societies. According to Sahin (2006), numerous studies from different and diverse disciplines, have used Diffusion of innovation theory as a framework to explain diffusion and adoption of innovation. Therefore, this study finds support in the theory in explaining innovation strategies on performance of data Service providers in Kenya. The most successful adoption of innovation results from understanding the factors influencing their rate of adoption. This theory supports the variable innovation strategies and performance of DSPs since it articulates how an idea is converted into practical innovative products.

2.2.3 Open Innovation Theory

Open innovation theory points to the use of “purposeful inflows and outflows of knowledge to accelerate innovation internally while also expanding the markets for the external use of innovation” (Chesbrough 2006). This involves strategic, managed exchanges of information with actors outside of the boundaries of an organization, aimed at integrating their resources and knowledge into the organization’s own innovative process (Pénin et al. 2011). Open innovation theory is grounded in the recognition that firms can harness knowledge from multiple sources to enhance innovation and thus deliver additional value for customers. Put differently, when relying on an open innovation model, a company does not strive to generate the best ideas entirely by itself, rather, it seeks to utilize internal and external ideas in an optimal manner, to be more effective at managing cost and risk and to accelerate technology development (Grandstand 2011).

The throughput of Open Innovation Theory is considered relevant to effect of innovation strategies to performance Data Service Providers in Kenya. Promotion of this theory can be traced to Chesbrough (2003), who used the term 'open innovation' in reference to the antithesis of the traditional vertical integration model, where internal innovation activities lead to internally developed products and services that are then distributed by the firm.

The Open innovation theory was originally referred to as a paradigm that assumes that firms can and should use external ideas as well as internal ideas, to grow and market their products as the firms look to advance their technology (Chesbrough, 2003). More recently, it is defined as "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries" (Chesbrough & Bogers 2014). This more recent definition acknowledges that open innovation is not solely firm-centric (Berthon et al. 2007) It also includes creative consumers and communities of user innovators. West, Joel; Lakhani, & Karim (2008) reiterate that the boundaries between a firm and its environment have become more permeable. Therefore, innovations can easily transfer inward and outward between firms and other firms and between firms and creative consumers, resulting

in impacts at the level of the consumer, the firm, an industry, and society (Bogers et al.2017)

While acknowledging that this more recent definition includes creative consumers and communities of user innovators, Dahlande and Gann (2010) reiterate that integrating feedback from partners as creative consumers into the innovative process can enable a company to better target its innovation efforts. In particular, the integration of users into the innovation process permits a firm to capture potential customers' latent requirements. This facet of innovation theory is seen to contribute to this study in market innovation strategies. In line with the study, market innovation is viewed as a strategy concerned with noting and adopting changing customer needs since, as business environment change, the components of customer value are also likely to change (Hagedoorn & Ridder, 2012). As a result, the firm's ability to reconfigure the market value chain and create innovation through interactions with customers, a considerable aspect of open immolation theory, will underscore a firm's operational success and competitiveness. Bröring, (2013) compliments the view by arguing that entrepreneurial orientation which is characterized by alertness or recognition of opportunities, with special sensitivity to make and use problems, unmet needs and interests, in discovery of novel opportunity discovery for innovation. In this case, the theory contributes well to market innovations and entrepreneurial orientation.

The open innovation paradigm can be interpreted to go beyond just using external sources of innovation such as customers, and companies, and can be as much a change in the use, management, and employment of intellectual property (Locatelli et al. 2020) In this sense, it is understood as the systematic encouragement and exploration of a wide range of internal and external sources of knowledge in intellectual property for innovative opportunities (West & Gallagher, 2006). Collaboration in knowledge sourcing via use of intellectual property can intuitively exploit their own and other firm's knowledge and innovations in a strategic manner (Herzog 2008). In fact, increasing tradability of intellectual property rights has simplified the exploitation and sharing of knowledge and investments in innovation (Granstrand 2011). Firms can more easily "transfer" knowledge and rights to use

their inventions. For Data service providers, intellectual propriety knowhow can be a less costly bridge in absorbing expertise in internet technology innovations. It can be observed that most of data service provider innovation platforms are software-based. Therefore, knowledge collaborations can be a strategic-assets, supporting internal expertise outside of the firm (Gassmann 2010).

The Open innovation theory contributes much in shaping the external environment for innovation affecting firms in virtually every sector (Pénin et al. 2011), including those offering data services. For example, several factors in particular may induce innovators to adopt open innovation such as globalization. Another factor is product complexity. Product complexity has increased to the point that even the largest service offering firms can no longer afford to do everything in-house (Williamson & De Meyer 2012) and therefore the need for open innovation collaboration. This is exactly why Data service providers should adopt open innovation theory. At the same time companies are faced with increased pressure to focus on core competences (Pénin et al. 2011), an important element in strategic management. As a result, firms tend to partner to obtain the resources and knowledge they need to compete effectively, thereby pointing to the very need of open innovation inclusion. Recently there has been gravitation towards outsourcing of services as evidenced in big Data Service Providers in Kenya. Industry convergence is a critical factor of consideration in open innovations. Empirical evidence indicates that open innovation models are most common in sectors that are characterized by technology fusion, globalization, and technology intensity (Huizingh 2010) like data service providers.

2.2.4 Disruptive Innovation Theory

The disruptive innovation theory was developed by Christensen in 1997. According to Christensen disruptive innovation creates a new market and value network and eventually disrupts an existing market and value network, displacing established market-leading firms, products, and alliances (Ab-Rahman et al., 2017). The concept that was developed by Clayton Christensen and his collaborators beginning in 1995 (Christensen, 2003) has been called the most influential business idea of the early 21st century. Comprehending Christensen's disruptive innovation, is central to

understanding how novel technology facilitates the rapid destruction of established technologies and markets. To this, Christensen noted that products considered as disruptive innovations tend to skip stages in the traditional product design and development process to quickly gain market traction and competitive advantage (Rajagopal, 2014).

In line with disruptive innovation theory, Lettice and Thomond (2016) assert that disruptive innovation is “a successfully exploited product, service or business model that significantly transforms the demand and needs of an existing market and disrupts its former key players”. There is congruence with this assertion in relation to innovation activities that can be derived from data services as internet/data service continually create new markets and value networks and consistently disrupt and displace established market of products, and alliances. The existence of buyer seller platform in this line of this innovative discovery is case in point. E-commerce has emerged as paradigm that is driving business to new levels day by day. In this vein, disruptive innovation theory is a good source point in informing this study on innovation strategies on performance of data service providers in Kenya

Disruptive innovation can also be viewed as innovations and technologies that make expensive or sophisticated products and services accessible and more affordable to a broader market. (Lettice & Thomond, 2016) Disruptive innovation refers to the use of technology that upsets a structure, as opposed to "disruptive technology", which refers to the technology itself (Bagehot, 2017). For example, the story of Amazon, online bookstore in the launched mid-1990s is well known. The online bookstore, has over time significantly transformed the demand and needs of the online existing market to what it is today. The internet was disruptive because it was not an iteration of previous technology. It was something new that created unique models for making money that never existed before. Innovations based upon internet appear to conform to with suggestions of Lettice and Thomond (2006) who aver that disruptive innovations create principal changes in the exercises of an association and speak to an expansive takeoff from existing practices.

Disruptive innovation can create a new market or enters at the bottom of an existing market by providing a different set of values, which ultimately (and unexpectedly) overtakes incumbents (Ab Rahman, et al. 2017). Disruptive innovation transforms expensive or highly sophisticated products or services previously accessible to a high-end or more-skilled segment of consumers to those that are more affordable and accessible to a broader population. This transformation disrupts the market by displacing long-standing, established competitors. According to Miller (2018). The most disruptive technologies from 2020 onwards will include automation, the internet of things (IoT), digital twinning, digital currency interactions, and enhanced smart technology The new way of doing things by use of internet data services, for example, distance learning has a new and large part of the education market, displacing traditional education. As technology improved for online teaching and web-based learning the online courses became less inferior and started competing with the traditional schools, (Smith, et. Al, 2020)

In most cases, technological revolution is driven by information technologies and modes of communication in our modern society. The internet was disruptive because it was not an iteration of previous technology. It was something new that created unique models for making money that never existed before. The evolution of internet has brought about a disruptive intelligent exchange of information between objects, enabling the creation of a new range of products and services in the real and virtual worlds (Sánchez-Alcon, 2015). As such, firms dealing in data service industry operate within a continuum of eruptive innovation possibilities. Innovation based on data service provision platform fit within disruptive innovation as internet/data service continually create new markets and value networks and consistently disrupt and displace established market of products, and alliances.

Innovation strategies can benefit from the agility of new technologies, providing for development of new ways of creating value for the market (Zott, 2010). This has become so especially in technology-based service in data service providers that attract disruptive Innovations (Nybakk & Jenssen, 2012). It is important to note that disruptive innovations are not breakthrough technologies that make good products better; rather they are innovations that make products and services more accessible

and affordable, thereby making them available to a larger population. "New market disruption" occurs when a product fits a new or emerging market segment that is not being served by existing incumbents in the industry (Rajagopal, 2015). A case in point is the transformations in financial technology that has disrupted old banking models. Banks perform payment and transfer functions for an economy. The internet can now facilitate and even perform these functions. As Wu et. al (2019) describe it, internet is changing the way that transactions are performed and is facilitating both public and private digital currencies. Even the nature of deposits is being transformed. Banks in the future will have to accept deposits and process transactions made in digital form, either Central Bank Digital Currencies (CBDC) or cryptocurrencies (Liu et.al., 2020). The overarching disruptive innovations as discussed, point to support of this theory in studying innovation strategies and performance of data service providers in Kenya. From the foregoing, the linkage of disruptive innovation theory to this study is well firmed

2.2.5 Resource Based View (RBV)

For firm offering services like DSPs, resources can often be limited, and these constraints can interfere with their innovation abilities. To meet the research aim of this study, it is paramount to look into the theory of Resource-based view (RBV) on the impact of firms' resources on innovation. The Resource Based View Theory by Selznick (1957) holds the view that individual organizations possess 'distinctive competence' that enables them to outperform their competitors. Based on the assumption that strategic resources affect the ability to outperform competitors, the RBV theory goes back to Penrose (2009), who explained how organizations evolve and grow over time.

Penrose (2009) reiterated that the resources possessed, deployed and used by the organization are important than industry structure. Penrose thus argued that a "firm's internal and subsequent external growth is due to the way in which the resources are exploited" (Almarria & Gardinera, 2014). If a firm is to achieve a state of sustainable competitive advantages it must acquire and control valuable, rare, inimitable, and

non-substitutable resources and capabilities, plus have the organization in place that can absorb and apply them (Kraaijenbrink, Spender & Groen, 2009).

A widely discussed issue in the RBV Theory is whether abundant or limited resources lead to increased firm performance. Scholars like (Bradley et al., 2011a; van Burg et al., 2012) have instead argued that constraints affect firms' creativity. This fronts resources as distinctive competencies such as skills, and capabilities that enable a firm to pursue a strategy more efficiently and effectively than others. Recent findings have indicated that resource orientation is positively related to new product success and innovations (Paladino, 2007). Moreover, efficient resource utilization supports the technological capabilities of a firm (Song et al., 2005). As initially viewed by (Penrose, 1959) resources include reproductive resources such as the management teams, top management and entrepreneurial skills pegged to intrinsic bundle of internal resources within management.

Distinction is made between resources in a number of ways. First, resources can either be tangible (e.g. finances, materials, employees) or intangible (e.g. skills, capabilities; Galbreath, 2005; Saunila and Ukko, 2014). Other authors differentiate between classes of resources (e.g. human, financial, or physical) or their level of stickiness (especially regarding human resources and financial resources; (Bakar and Ahmad, 2010; Bradley et al., 2011b; Hoegl et al., 2008). This means that, while financial resources can quickly be put to alternative uses (Bradley et al., 2011a; Mishina et al., 2004), human resources are more distinctive and stickier, as the expertise of employees is often bound to certain tasks (Mishina et al., 2004). The study echoes the view that Resource Based View Theory (RBV) has emerged as a prolific theory of competitive advantage (Almarria & Gardinera, 2014).

The resource-based view reiterates that a firm is a bundle of assets or resources which are tied semi-permanently to the firm. The theory suggests that firms should develop unique, firm-specific core competencies that will allow them to outperform competitors by doing things differently. Further, RBV proposes that firms are heterogeneous because they possess heterogeneous resources, meaning firms can have different strategies because they have different resource mixes. In continuum,

the firm's capability to exploit the resources is equally a source of sustainable competitive advantage. Firm resources are those assets connected semi-permanently to a firm and include human, social, technological, knowledge, physical and financial (Ernst & Young, 2012). A firm's own resource provides a much more stable context in which to develop its innovation activity and shape its market (Ellul & Yerramilli, 2010).

Dimache and Roche (2011) links the RBV to innovation and reiterate that the successful innovators are organizations that build and manage knowledge-based resources effectively. They are the most enthusiastic about pursuing knowledge and the most likely to harness the power of innovation (Bakar & Ahmad, 2010). From this view, the linkage to innovations and performance is well firmed. This study reinforces the view that Data Service Providers superior performance can be harnessed from adsorption and utilization of firms bundle of resources as a strategic competitive advantage. The study argues for a direct relationship between valuable, rare, inimitable, and non-substitutable capabilities and organizational performance. Particularly, having a broad strategic utilization of opportunities presented by internet evolution that enable the creation of a new range of product innovation, process innovation, new market dynamics, unique capabilities, products and services.

RBV focuses on the heterogeneous resource that a firm possesses, and suggests that resources possessed by a firm are primary determinants of performance, and may contribute to a suitable competitive advantage. Barney (2010) stated that for resources to hold potential as sources of sustainable competitive advantage, they should be valuable, rare, imperfectly imitable and not substitutable. Firms obtain competitive advantage from unique bundles of tangible and intangible assets that are rare, valuable, imitable and sustainable (Yang, 2011). Firm's own resource provides a much more stable context in which to develop its innovation activity and shape its market (Ellul & Yerramilli, 2010). When firms have resources that are valuable, rare and not easily copied, they help the firm achieve a sustainable competitive advantage mostly in the form of innovative new products (Trott, 2008). In this way, organizational resources provide the input that is combined and transformed by capabilities to produce innovation.

Barney (2010) point to strategic assets as the resources that include all assets, capabilities, organizational processes, firm attributes, information, knowledge, among others controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness. Organizational capabilities reflect the ability of the firm to perform repeatedly, or 'replicate' productive tasks that relate to the firm's capacity to create value through effecting the transformation of inputs into outputs. Argument is made that firm capabilities happen by integration of specialist knowledge across a number of individuals, and are associated with the development of organizational competences and routines (Ellul & Yerramilli, 2010). Organizational capabilities are a source of the firm's performance advantages. Organizational capabilities are viewed as the capacity for a team of resources to perform some task or activity (Kraaijenbrink, Spender & Groen, 2009) and the ability of a firm to deploy resources, usually in combination, using organizational processes to produce the desired effect (Akio, 2005). The concept of capability is therefore the capacity of a firm to convert resources they possess into the service (Akio, 2005).

This study therefore concludes that organizations that are able to integrate, build, and reconfigure internal and external competences to address rapidly changing environments where service providers like DSPs are under pressure to continuously adapt to the ever-changing business environment (e.g. globalization, change in customer behavior, trends towards purchasing services as distinct from products. Therefore, Data Service providers, can no longer rely on the traditional product focused business models; they need to be highly adaptive and innovative in order to compete (Dimache & Roche, 2011).

Apart from financial resources, knowledge-based resources (Wang, 2007), redefines discovery of ideas and exploitation of opportunities for innovation (Kaya & Patton, 2012). Knowledge allows firms to accurately predict the nature and potential of changes in the environment and the appropriateness of strategic actions thereby providing solid foundation for accumulation and development of other resources by the firm (Price, Stoica & Boncella, 2013). These resources include knowledge created by the firm internally and acquired by the firm from other sources of

knowledge. A firm's own resource provides a much more stable context in which to develop its innovation activity and shape its market (Ellul & Yerramilli, 2010). A source of knowledge can be attributed to a firm's entrepreneurial orientation. Wiklund and Shepherd (2005) view entrepreneurial orientation as a firm's strategic orientation, capturing specific entrepreneurial aspects of decision-making styles, methods and practices. The decision-making styles, methods and practices reflect resources that are valuable, rare and not easily copied by other firms (Anderson. 2009; Laukkanen, Nagy, Hirvonen, Reijonen & Pasanen, 2013). As earlier stated, knowledge-based resources redefine discovery of ideas and exploitation of opportunities for innovation (Kaya & Patton, 2012). Knowledge allows to predict the appropriateness of strategic actions and the requisite defense mechanism while under threats of competitors reflecting the tenets of entrepreneurial orientation. Knowledge resources include knowledge created by the firm internally in form of entrepreneurial orientation which is a top management inherent knowledge.

Therefore, the theory supports entrepreneurial orientation as bundle of resources and capabilities, which are heterogeneous, rare, durable, and not easy to copy or buy. Entrepreneurial orientation is a bundle of resource as well as innovation capabilities. The bundle of resources and innovation capabilities drive organizational-level behavior to perform risk-taking (Trott, 2008) and engagement in innovation which is a multi-stage process in which ideas are generated and transformed by organizations into new or improved products, services, technologies and processes that benefit the firm and its stakeholders through increasing its competitive position and differentiation in the marketplace.

2.3 Conceptual Framework

A conceptual framework is a concise description of the phenomena under study accompanied by graphic or visual depiction of the major variables of the study (Mugenda, 2008). It is a basic structure that consists of certain abstract blocks which represent the observational, experimental and the analytical/ synthetically aspects of a process being conceived (Bogdan & Biklen, 2007). The conceptual framework thus

explains the possible connection between the variables and answers the why question.

In this study conceptual framework was informed by the Schumpeterian theory of innovation. The theory highlights innovation in four key dimensions which are: process innovation, product innovation, market innovation and technological innovation. According to Schumpeter, these dimensions are integral in enhancing firm performance by enabling the firm differentiate its products and services for better customer satisfaction, increased sales and profitability. Moreover, Schumpeter addresses roots for entrepreneurship that is ready to take risks, anticipate future trends by being proactive as well as being competitively aggressive in mobilizing resources to support innovation strategies. Therefore, as informed by Schumpeter, the conceptual framework as shown in Figure 2.1 envisages a conceptual adoption of innovation strategies with integrated entrepreneurial orientation in stimulating performance.

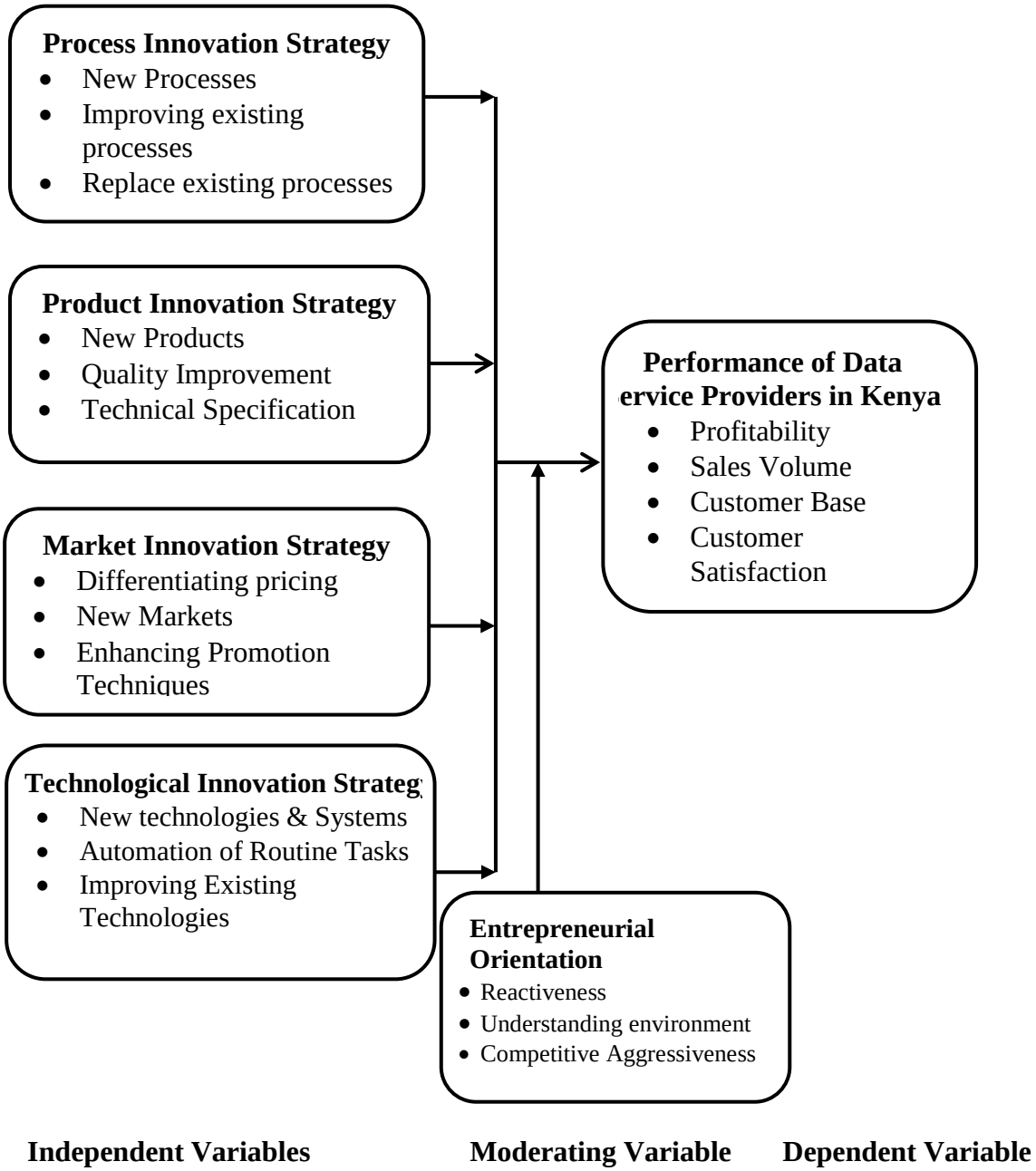

Figure 2.1: Conceptual Framework

2.4 Variables Review

2.4.1 Process Innovation Strategies

Innovation can take different directions as it impacts products and processes. This includes changing the method that a process takes and how it is delivered to the end-user, changing what services are offered and this might include discontinuing outdated services or support, changes that are conceptual as to how end-users perceive use of the product as it relates to the larger organization (Genc & De Giovanni, 2017). In a continuously evolving business world, firms are asked to repeatedly improve their processes and products to accommodate demand without sacrificing time, quality and cost (De Giovanni, 2013). A process innovation strategy increases production process efficiency, reduces waste and lowers marginal production costs (Handfield, 2015). These developments are accompanied by a change in routines and industrial standards, which are firmly established and influence the relationship with the firms' consumers. To this end, Gotschol (2014) insist that improvements in the production system have a positive influence on the relationship because they show a firms' willingness to make progress in new innovations.

Cozzarin (2017) view process innovation as a process improving the production and logistic methods significantly in an enterprise, or bringing significant improvements in the supporting activities such as purchasing, accounting, and maintenance and computing. Felin (2014) congruence that process innovation is the introduction of a new method of production; one that is yet to be tested by experience in the branch of manufacture concerned. Tavassoli and Karlsson (2015) add that process innovation is the implementation of a new or significantly improved production or delivery method and can be intended to diminish unit expenses of generation or conveyance to increment/enhance efficiency or administration conveyance quality. This may include significant changes in techniques, or equipment as suggested (Cozzarin,2017). Process innovation strategies may include execution of new or essentially enhanced techniques (Tidd & Bessant,2018), basic process advancement procedures, changes in strategies or hardware (Nguyen & Harrison, 2019). Process

innovation strategies may include; adopting the supply chain concept, and implementation of the global reference model (GRM) (Kumar & Harshitha, 2019).

The value of process innovation is seen in the argument of Medda (2020): Firms bring novelties in the production and delivery method to bring efficiency in the business. According to Phung et al. (2021), the new method must be at least new to the organization where organization had never implemented it before (Sein & Prokop, 2021). The firm can develop new process either by itself or with the help of another firm. There is general consensus in the literature that process innovation is mainly production oriented and performance consequences are measured using the production process indicators of cost reduction, flexibility and capacity improvement, avoiding traditional measures based on sales, which are more product oriented (Tavassoli & Karlsson, 2015) This helps shape conclusion that process innovation strategy is much more closely related to technological change, rather than to intangible investment in R&D (Sein & Prokop,2021). In this way, process innovation is mainly led by embodied technology, while disembodied technology affects product innovation (Sjödin, 2019). Argument in this study however deviates from universality of such a conclusion. The study sees research and development efforts as also related to skills and other forms of tacit knowledge applied to production. Firms obtain competitive advantage from knowledge that is rare valuable, imitable and sustainable. When firms have resources that are valuable, rare and not easily copied, they achieve a sustainable competitive advantage (Radnejad & Vredenburg 2019). Organizational resources provide the input that is combined and transformed by capabilities to produce innovation (Kranich & Wald, 2018). It can be concluded therefore that process innovation is equally a development of efforts related to skills and other forms of tacit knowledge than just change of production process.

As viewed by Suwignjo et al. (2022), successful process innovation itself contains new production model tactics or new technology to create new or improved products or services for the market to use. Additionally, skills and knowledge resources help firms to decide the utilization of technology (Şimşek & Yıldırım, 2016) and how to maximize its usability and performance to achieve a specific goal. Adopting and

implementing process innovation may help firms to understand on how to organize and control technology-based innovation.

West, et al. (2014) analyzed successful companies that implemented process innovation and the evolution in industry which trigger the modification of the production process itself. Their findings agree with for example, (Felin, 2014) and collaborated by (Herzog & Leker, 2010), that firms should exploit their internal and external ideas path to market as they look to advance production process. Firms adopt process innovation as a part of overall organization strategy so as to decrease the production cost and hence reflect the level of process innovation in product costs (Olson, 2013). Process innovation, especially in the data service providers can have significant impact on the productivity and profitability.

2.4.2 Product Innovation Strategies

Tavassoli (2018) define product innovation as the introduction of a new item or service; one in which consumers are not yet familiar with or the introduction of new functions, enhanced performance or the addition of new features into the existing products. Expanding on this, Medda (2020) reiterate that product innovation incorporates both physical product and service changes or newness. Tavassoli and Karlsson (2015) add that product/service innovation strategies involve the presentation of a product or a service that is new to the market or has been altogether enhanced in connection to its attributes or employments. These attributes may incorporate critical enhancements in mechanical determinations, segments and materials, joined, or ease of use among different capacities (Wang et al.,2019). On the other hand, Polder (2010) argue that product innovations greatly influence businesses today and firms employ product innovation to bring efficiency in the business and reflect the nature of strategy adopted by the firm.

The flare of product innovation is traceable in prodigious profits reaped by businesses that are capable of differentiating their product from other businesses in the same industry (Wong, 2014). This can be linked on how data service providers can use product innovation to better differentiate their product from others. Product differentiation can be termed as marketing process that showcases the differences

between products (Yin, Ming & Zhang, 2020). As posited by Hoang and Paul (2010) product differentiation looks to make a product more attractive by contrasting its unique qualities with other competing products. Successful product differentiation creates a competitive advantage (Wong, 2014) for the seller, as customers view these products as unique or superior. Businesses that once again are able to successfully utilize product innovation will thus entice customers to switch brands from rival brands to buy its product instead as it becomes more attractive to the customer (Wong, 2014). It is therefore agreeable that businesses that are able to utilize product innovation effectively will be able to expand and thus grow into larger businesses, while gaining a competitive advantage over its competitors.

In a highly competitive environment as it is in the modern market, firms come up with strategies that are aimed towards developing new products that meet customer needs and enhance customer satisfaction (Tavassoli, 2018). As observed by De Giovanni (2013), product innovation strategies are majorly driven by advance in technologies, ever changing customer taste and preferences, shortening item cycles and expanding rivalry. To this end, Yusif (2012) concludes that changing customer taste and preferences requires service innovation which is seen as both product and process innovation. Unlike in manufacturing industry where there is continuous emphasis on physical products, service innovation has been linked to the creation of customer value (De Giovanni, 2013), which is a customer's perceived preference for a product's attributes and performances. Services are basically processes of interactions between the service provider and the consumers. The service firm's ability to reconfigure the service process and create innovation through interactions with the consumers remains core to the operational success and competitiveness of product innovation strategy (Yusif, 2012). Successful service firms always ensure a successful participation of the customer in the creation of value so desired by the customer. Genc and De Giovanni, (2017) opines that involvement of customers in organizational innovation teams is rapidly becoming more prevalent. Customer involvement is a kind of interactivity innovation, where service firms create the environment for the customer to direct the interaction and involve the customer in the service delivery process. In the particular case of data service providers, valuable

innovation possibilities can be achieved through interactions with consumers that often requires that firms anticipate future customer needs and the market dynamics.

2.4.3 Market Innovation Strategies

With globalization, the increased focus on the customer, high number of competitors, economic changes, interconnectivity between markets and technological changes, organizations are forced to rethink their traditional models and develop new market innovation strategies to gain competitive advantage (Tavassoli & Karlsson, 2015). Understanding the market dynamics, according to Sinfield, (2012), can lead to discover new market opportunities, to better attend the clients' needs, putting the company in a place ahead of their competitors. Focusing on market innovation strategies, Roper and Hewitt-Dundas (2017) argue that new or adapted strategies can result in cost reduction or enhance the value perception from the customer's perspective and, if not easily replicated, the strategy can generate high results for the pioneers.

Marketing innovation strategies involve the implementation of new marketing methods and models that would significantly change the product design or packaging, product placement or pricing (Tavassoli & Karlsson, 2015). Marketing innovation strategies are targeted at meeting the customer's needs and opening up new markets or giving the firm's products a new position in the market to increase the firm sales hence income (Siadou-Martin, 2021). Adding to this, Le Velly (2021) aver that common marketing innovation strategies include; market pricing strategies, product offers, design properties, product placements strategies and promotion activities. According to Hong (2015), innovative marketing strategies improve brand relationship and experiences with customers by exerting their influence on brand marketing efforts and allowing brands to be customer centric.

It follows that market innovation can improve the mix of target markets and facilitate how chosen markets are best served (Le Velly, 2021). In continuum, market innovation can help in identifying better (new) potential markets and better and new ways to serve target markets (Hong, 2015). Market segmentation, which involves dividing a total potential market into smaller more manageable parts, is critically

important if the aim is to develop the profitability of a business to the full (Geiger & Gross, 2018). Incomplete market segmentation will result in a less than optimal mix of target markets, meaning that revenues, which might have been earned, are misread (Puglisi & Celani, 2017).

As viewed by Ekman et al. (2021) market innovation is concerned with noting and adopting changing customer needs. As business environment changes, the components of customer value are likely to change. As a result, the firm's ability to reconfigure the market value chain and create innovation through interactions with customers remains core to the firms' operational success and competitiveness (Tavassoli & Karlsson, 2015). Further, Setyadi and Oetomo (2017) compliments the view by arguing that entrepreneurial alertness or recognition of opportunities is a propensity to notice and be sensitive to information about objects, incidents, and patterns of behavior in the environment, with special sensitivity to make and use problems, unmet needs and interests, and novel combinations of resources. In this case, the market needs and resources represent opportunity discovery for innovation.

2.4.4 Technological Innovation Strategies

Technological innovation is a key factor in a firm's competitiveness and therefore innovation is unavoidable for firms which want to develop and maintain a competitive advantage and gain entry in to new markets (Rip & Rip, 2018). In this sense, several studies for example, (Lui, 2016) point out that changes provided by the new technologies reflect positively on the performance of the companies, allowing competitive advantage through innovation and, consequently, their distinctiveness in relation to their competitors. Wang and Nie (2021) observe that innovation prevails in technology-based companies, since they are organizations that apply technical knowledge for the creation of innovative products. They make significant innovations based on technological efforts and develop new ideas for products, processes and services; consequently, they generate and depend on innovation (Sanches and Machado, 2013). It makes sense to suggest that firms in technology have benefited from the agility of new technologies, providing the development of

new ways of creating value for the market through an innovation process and generation of new business models (Faqih, 2022).

As suggested by Pacheco, (2016), studies that attempt to identify the sources of innovation point to technological innovation. Agreeably, organizations, in all sectors of operation, face proliferation of variety of new technologies, which end up generating business opportunities (Tongur & Engwall, 2014). Agreeing with this, Ekman et al. (2021) assert that there is evidence of tremendous organizational transformations through innovation fueled by agility of new technologies, providing the development of new ways of creating value for the market through innovation processes, that expand boundaries of organizations and contribute to the generation of new business strategies. New technologies introduced in the market present possibility to innovate in the offering of products and services (Pacheco, 2016)

The success of most firms majorly depends on efficient operational processes resultant from more investments in technologies that enhance firms' internal efficiencies (Munyoroku, 2014). Thus, organizations' mainly focus on emerging technologies to provide the steady supply of new products, services and processes, influencing business and market structures (Bashir & Verma, 2016). Therefore, technological innovation strategies adopted by firms should help identify and explore new revenue opportunities and improve customer satisfaction (Le Velly, 2021). It is agreeable then that internet based technology, presented by data service providers is driven by new ideas and advances in technology that can create new value for the overall business (Planko, et al.,2017). This may involve identifying and exploring emerging and existing nodes of internet based add value opportunities and working together with consumers to create new business innovations. Valacich and Schneider, (2012) aver that technological innovation may involve integration of specific technologies, including gaming, mobile technology, social media, and robotics Additionally, technological innovation can involve adoption of systems such as ERP systems that provide capabilities that support and enhance processes associated with producing. The systems should also help improve firm activities by automating routine tasks such as order management.

As Zwass, (2013) posit, E-commerce presents an avenue for technological innovation that involve and evolve to inter-organizational processes of market-based sell-buy relationships, collaboration and consumer-oriented activities (business-to-consumer and consumer-to-consumer), as well as the intra-organizational processes that supports them. Therefore, organizations are embracing e-commerce technology as a means of expanding markets, improving customer service, reducing costs, and enhancing productivity (Guo, Yang, & Han, 2019). In this technology, efficiencies are experienced in marketing and advertising in new technologies making disintermediation possible and eliminating the middleman (Kanda et al., 2019), In the end, better profit performance is near assured.

2.4.5 Entrepreneurial Orientation

Wales, Gupta, and Mousa (2013) portray entrepreneurial orientation as dissemination of entrepreneurial practices and the related shared values that originate with firms' top management. It can be stated that entrepreneurial orientation starts at the highest organizational levels and the objective is to disseminate practices for identification and exploitation of opportunities. Kiani et al. (2022) describe entrepreneurial orientation as business model applied to firms that regularly innovate in decisions, taking risks in their strategies, whether in product or market. Bernoster, Mukerjee, and Thurik (2020) reiterate that the entrepreneurial firm as "one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with 'proactive' innovations, beating competitors to the punch". A non-entrepreneurial firm is characterized by minimum level of innovations, low risk-taking behavior, and more of a follower than pioneer type of organization as compared to the competitors (Ibidunni et al., 2018). Elsewhere, Al Mamun and Fazal (2018) view entrepreneurial orientation as 'a firm's strategic orientation, capturing specific entrepreneurial aspects of decision-making styles, methods and practices'.

Entrepreneurial orientation is a firm-level strategic orientation which captures an organization's strategy-making practices, managerial philosophies, and firm behaviors that are entrepreneurial in nature (Laukkanen et al., 2013). About this, Mousa (2013) affirm that entrepreneurial orientation refers to the strategy making

processes that key decision makers of a firm use to enact their firm's organizational purpose, sustain its vision, and create competitive advantage(s). Entrepreneurial orientation has been conceptualized as the process and decision-making activities used by firms that leads to entry and support of business activities (Laukkanen et al., 2013) and as the strategy-making processes that provide organizations with a basis for entrepreneurial decisions and actions (Rezaei & Ortt, 2018). Further, entrepreneurial orientation has been conceptualized as comprising three dimensions namely; innovativeness, risk-taking and pro-activeness (Frank, Kessler, & Fink, 2010).

Entrepreneurial orientation has emerged as an important factor for investigating firms' entrepreneurial spirit and its influence on strategic processes (Hitt, Ireland, & Sirmon (2013) and a significant factor for a firm's success (Pittino, Visintin, & Lauto, 2017). Thus, managers must assume an entrepreneurial behavior and analyze the business beyond their traditional perspectives, looking for new ways of creating and capturing value through new business models (Wahyuni & Sara, 2020). In a dynamic business environment, future profit streams are uncertain and businesses need to continuously seek out new opportunities and efficiently exploit them (Rezaei & Ortt, 2018).). This is assured through entrepreneurial activities in a firm. Therefore, entrepreneurial orientation represents strategy making processes that provide organizations with a basis for entrepreneurial decisions and actions (Achtenhagen, 2020). Emphatically, it encompasses specific organizational-level behavior to perform risk-taking, self- directed activities, engage in innovation and react proactively and aggressively to out-perform the competitors in the marketplace (Pittino, Visintin, & Lauto, 2017).

According to Achtenhagen (2020), the practice of entrepreneurship focuses on the exploitation of opportunity through creativity and innovation to maximize on potential profits and growth. In entrepreneurially intense cultures, everyone seeks to find the best paths to take to innovate and to help the firm reach its full commercial potential while employees try to find ways to increase their knowledge (Ibidunni et al., 2018). Arguably, a firm with a high degree of entrepreneurial intensity, great value is placed on viewing change and the uncertainty it often creates as the

foundation for opportunities to innovate and improve an organization's performance (Solikahan & Mohammad, 2019). In congruence, Buli (2017) aver that, in an entrepreneurial culture, the focus is on the future rather than the past and the ability to develop and transfer knowledge is greatly valued. We can therefore agree that an organization culture influenced by entrepreneurial orientation place high importance on being able to empower people in ways that allow them to act creatively and to fulfill their innovation potential.

A firm's growth and profitability is fueled by entrepreneurial orientation. Certain studies relate high growth with a firm's entrepreneurial orientation (Kiani et al., 2022). High growth would be a result of innovativeness, pro-activeness and risk-taking orientation by the firm, the scopes which refer to an entrepreneurial orientation (Kiyabo & Isaga, 2020. In current business environments like in data service providers, where product and business model lifecycles are shortened entrepreneurial characteristics are positively associated with better performance. Risk-taking is connected with making decisions and taking actions without any knowledge of the possible outcomes (Bernoster, Mukerjee & Thurik, 2020) while considering proactiveness (Buli, 2017)). Proactiveness is treated as a forward-looking perspective as a result of which first-mover or market-leader advantages can be achieved (Wang et al., 2020). Proactiveness involves searching for market opportunities in order to introduce onto the market new products or services ahead of one's competitors, as well as anticipating future demand, (Lee & Chu, 2017), a facet of market innovation.

2.4.6 Firm Performance

Firm performance has recently become a critical concept in strategic management research. As cited by Ikpe et al. (2021), despite the fact that it is a widely held concept in academia, there is little agreement on how to define and quantify it. Granted, there is no operational definition of firm performance that invariably majority of experts agree on. Therefore, different interpretations will naturally be proposed by different persons based on their personal opinions. This concept's definitions can be abstract, generally defined: In the 1950s, firm performance was

equated to organizational efficiency, which refers to how well an organization, as a social structure with limited resources and means, achieves its objectives without requiring excessive effort from its members. Productivity, adaptability, and inter-organizational tensions were utilized to evaluate performance at the time (Omar and Issor, 2019). Organizations began to experiment with new approaches to evaluate their performance later in the 1960s and 1970s. Performance was characterized at the time as an organization's capacity to exploit its environment in order to access and use the limited resources. Omar and Issor (2019), views performance to be synonymous with organizational effectiveness, and specifies productivity, conformity, and institutionalization as appreciation criteria.

According to Alam (2011), external parties normally evaluate a firm's ability based on its performance. This implies why performance is like a mirror to a firm. The level of goal accomplishment generally defines a firm's performance (Tayeh, Al-Jarrah, & Tarhini (2015). Firm performance is the outcomes achieved in meeting internal and external goals of a firm (Rajapathirana & Hui, 2018). As a multidimensional construct, performance has several names, (Ahmad & Zabri (2016).) including growth, survival, success and competitiveness. Bayraktar et al. (2017), amplify this by asserting that firm performance is a multidimensional construct that consists of four elements, customer-focused performance, including customer satisfaction, and product or service performance; financial and market performance, including revenue, profits, market position, cash-to-cash cycle time, and earnings per share; human resource performance, including employee satisfaction; and organizational effectiveness.

In using organizational goal as a basis, different methods are adopted by different firms to measure their performance and this performance indicator can be measured in financial and non-financial terms (Otto, Szymanski & Varadarajan, 2020). Most firms, however, prefer to adopt financial indicators to measure their performance (García-Granero et al., 2018). However, financial elements are not the only indicator for measuring firm performance. There is a need to combine financial elements with non-financial measurement in order to adapt to the changes of internal and external environments (Anwar & Hasnu, 2017). Supporting this opinion, Bayraktar et al.

(2017) affirms that business performance can be divided into four dimensions: internal process, open system, rational goal and human relations, where each dimension is measured by any changes in its own variables.

Financial performance refers to the measurement of the results of a firm's strategies, policies and operations in monetary terms (Tayeh, Al-Jarrah, & Tarhini, 2015). These results are reflected in the firm's return on assets and return on investments (Burrus, Graham & Jones, 2018). As highlighted by Rachmadianti and Iswajuni (2020), financial performance provides a subjective measure of how well a company can use assets from its primary mode of business and generate revenues. Financial performance is measured by revenues from operations, operating income or cash flow from operations or total unit sales (Liu, Qu & Haman, 2018). The analyst or investor may wish to look deeper into financial statements and seek out margin growth rates.

Financial performance indicators in the form of ratios include profitability, liquidity, utilization financial structure and investment shareholder ratio (Philip, 2014). Measure of profitability is by gross profit margin; the amount of money made after direct costs of sales have been taken into account, operating margin; lies between the gross and net measures of profitability and net profit margin; takes all costs into account (Graham & Jones, 2018). Liquidity ratios indicate the ability to meet short-term obligations, efficiency ratios indicate how well the business assets are in use and financial leverage/gearing ratios indicate the sustainability to the exposure of long-term debt (Niemand et al., 2021). These ratios can be combined to determine the rate of return for a company and its owners and the rate at which the company can grow the sustainable rate of growth. By adding data about the company's stock market performance, the analyst can gain insight into how financial markets view the company's performance (Graham & Jones, 2018).

2.5 Empirical Review

This sub-section covers the review of previous studies, innovation strategies and firm performance.

2.5.1 Process Innovation Strategies

Goedhuys and Veugelers (2012), using World Bank ICS data from Brazilian manufacturing firms, identifies process innovation strategies of firms - in particular internal technology creation (make) and external technology acquisition (buy) and their effect on successful process and product innovations. The study also explored the importance of process innovations for firm growth. The findings affirmed that successful process and product innovations occur mostly through technology acquisition mostly embodied in machinery and equipment, either alone or in combination with internal technology development. The option of relying on internal development was found less performing. The results indicated that process innovative performance is an important driver for firm's growth. Borrowed from the findings, it is particularly the combination of product and process innovations that significantly improves firm growth.

Piening and Salge (2015) did a study on "Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective" The study examined one of the most important sources of competitiveness in dynamic industries, the capability of firms to introduce process innovations. The study aimed to investigate how firms become process innovators and why many firms fail to do so. In order to provide novel insights into the configuration of firms' process innovation activities and their performance implications, the study aimed to shed light on the antecedents, contingencies, and performance consequences of inter-firm differences in process innovation success, that is, firms' propensity and effectiveness of implementing new production, supply chain, or administrative processes. Particular emphasis was placed upon the analysis of potential complementarities or substitution effects between innovation activities such as internal and external research and development, prototyping, external knowledge acquisition, and employee training. The study findings suggested that by engaging in a broad range of different innovation activities, firms can indeed increase the likelihood of achieving process innovation success, which is in turn positively related to firm financial performance. Yet decreasing marginal returns to innovation

activities have to be considered as process innovation propensity was found to increase with the number of activities pursued simultaneously.

Muharam, Andria & Tosida (2020) sought to find out the effect of process innovation and market innovation on financial performance with moderating role of disruptive technology. This study examined the relationship between process innovation, market innovation and firm financial performance of Indonesian pharmaceutical firms. The study also investigated the moderating role of disruptive technology on the relationship of process innovation and market innovation with Indonesian pharmaceutical firms' financial performance. The result of the study highlighted that there is a positive relationship between process innovation, market innovation and financial performance of firms. While, results indicated that disruptive technology moderate the relationship of process innovation with financial performance, but it has no moderating role on the relationship of market innovation with financial performance

Nwankpa, Roumani and Datta (2022) did a study on process innovation in the digital age of business: the role of digital business intensity and knowledge management. The study examined the dynamic relationship between digital business intensity and process innovation through knowledge management. More specifically, the study investigated the mechanism through which knowledge management and process innovation jointly influence process innovation. The study argues for understanding the link between DBI and process innovation for various reasons such as prior research indicates that firms often struggle to realize process innovations' intended benefits. The results revealed a positive link between digital business intensity and process innovation.

A study by Maina (2016), sought to establish the effect of process innovation strategies adopted on the performance of insurance firms in Kenya. The study findings revealed that there is a strong relationship between insurance process innovation strategies and the performance of insurance firms in Kenya with e-procurement accounting for 35% of the total variance in the insurance firms' performance. The study recommended that the management of the insurance firms

should implement in full the process innovation strategies as this will lead to improved firm performance. Kariuki (2014) conducted a study on the effect of strategic innovation on performance of mobile telecommunication firms in Kenya. The study used descriptive research design in data collection and analysis. The study found out that strategic process innovation has positive effect on organizational performance. Adoption of superior process strategies relating to products, services, marketing processes and human resources led to superior organization performance. The study recommends that mobile telecommunication firms should invest more in research and development so as to be able to innovate more and adopt more process innovative strategies to improve performance. Ndungu, and Moturi (2020) aimed to identify the determinants that influence uptake of mobile financial technology (Fintech) and propose an appropriate model for uptake of mobile Fintech within the sector. This study established that technology factors, environmental characteristics and organizational factors have a strong influence on the uptake of mobile Fintech. These factors include technology availability, perceived technology benefits, organization size, resources availability, and competition, regulatory and legal environment. The uptake of mobile Fintech was found to reduce operation costs and improve business operations efficiency.

2.5.2 Product Innovation Strategies

Kuncoro and Suriani (2018) carried out a study on achieving sustainable competitive advantage through product innovation and market driving. The purpose of this study was to analyze and provide empirical evidence on; examining the relationship between product innovation and sustainable competitive advantage, examining the relationship between product innovation and market driving and examining the relationship between market driving and sustainable competitive advantage. The techniques of data collection were done by distributing a questionnaire to the respondent and made documentation or records of the sources of the requisite data. The analysis used in the study was the concept of Structural Equation Model (SEM) with Partial Least Square (PLS) program. The results of the study showed that the effect of Product innovation (PI) on sustainable competitive advantage (SCA) was positively significant, the effect of Product innovation (PI) on Market Driving (MD)

was found to be positively significant, on the other hand the effect of market driving (MD) on sustainable competitive advantage (SCA) was also found to positively significant. The study found that product innovation, market driving significantly affects sustainable competitive advantage.

Anning-Dorson (2016) studied Interactivity innovations, competitive intensity, customer demand and performance. The purpose of the study was to identify dimensions of interactivity service innovations and examine the moderating effect of external factors, i.e. customer demand and competitive intensity, on the relationship between such service innovations and service firm performance. Data were collected at two levels; the first for validation; and the second for confirmatory and relationship analyses. Structural equation modeling was used in analyzing the relationship between interactivity innovation and service firm performance and environmental moderating effects. The study found that high levels of interactivity innovations, in combination, drive superior performance. It was also found that deployment of high levels of interactivity innovations in high-demand periods is significantly related to high performance. The study also found that the relationship between high interactivity innovation and financial performance is dampened by intense competition.

Tavassoli and Bengtsson (2018) analyzed the effect of business model innovation (BMI) on the product innovation performance of firms, based on a dynamic capabilities theoretical framework. The empirical study was based on a large-scale representative sample of cross-industry Swedish firms participating in three waves of the Community Innovation Survey (CIS) from 2008 to 2012. The study hypothesized that business model innovation in the form of product innovations combined with different complementary and simultaneous innovations in processes, marketing and organization would act as isolating mechanisms towards replication by competitors, resulting in superior firm performance. The study findings provide support for such hypothesis. Business model innovation was found to be significantly and positively associated with superior product innovation performance. The study recommends that managers should frame and align product innovations in business model

innovation context, i.e., dynamically adapting product innovations with process, marketing and organization innovations.

Tavassoli and Karlsson (2015) analyzed innovation strategies of firms in Sweden for the period between 2002 and 2012 utilizing sixteen advancement techniques, which were made out of Schumpeterian 4 sorts of developments, (process, item, advertising, and authoritative). The study found that organizations are not homogenous in picking advancement systems; rather, they have an extensive variety of inclinations with regards to advancement procedure. Mabrouk and Mamoghli (2010), in their study on Dynamics of Financial Innovation and Performance of Banking Firms, Context of an Emerging Banking Industry, analyzed the effect of the adoption of two types of financial innovations namely; product innovation (telephone banking and SMS banking and so on) and process innovation (Magnetic strip card (debit, ATM and credit card), Automatic cash dispenser; (Automatic teller machine; Electronic payment terminal and so on), on the performance of banks. Their analysis included two adoption behaviors, first mover in adoption of the financial innovation and imitator of the first movers. They found out that first mover initiative in product innovation improves profitability while process initiative has a positive effect on profitability and efficiency. The study confirmed that banks that imitate are less profitable and less efficient than first mover.

Chege, Wang and Suntu (2020 carried out a study on the association between technology innovation and firm performance in Kenya by considering the impact of entrepreneur innovativeness on this association. The findings indicated that technology innovation influences firm performance positively. The study recommended that entrepreneurs should develop innovative strategies to actualize firm performance. Government policy should aim at improving ICT infrastructure; promoting small and medium-sized enterprises' (SMEs') technological externalities within the industry, and establishing ICT resource centers to support SME performance.

2.5.3 Market Innovation Strategies

Ndubisi and Nataraajan (2016) carried out a study on marketing relationships in the new millennium B2B sector. In highlighting the findings, the study echoed the role of marketing relationships as an appropriate response to the challenges of the new millennium business environment while an organization that has honed the skill of managing knowledge can respond successfully to the challenges of the new economy. For example, by forging strong and long-lasting relationships with suppliers and distributors, manufacturers can ensure a stable and sufficient flow of quality products in a timely manner at competitive prices. By doing the same, service providers can ensure not only a wider coverage and greater brand awareness, but also that quality support services are available to both internal and external customers of the firm.

Anning-Dorson, Hinson and Amidu (2018) carried out study on managing market innovation for competitive advantage and how external dynamics hold sway for financial services. Borrowed from the complexity theory, the study argued that external factors largely determine the effectiveness of firm-level strategies. Hence, firms must seek to align their strategies such as market innovation with the prevailing business environment to achieve competitive advantage. The study investigated the moderating effect of three environmental factors, regulatory regime, competitive intensity and customer demand, on the relationship between innovation and competitive advantage creation in financial services firms. Data were collected from the Ghana's financial services sector with a focus on banking and insurance institutions. Constructs were validated through confirmatory factor analysis while robust regressions estimates were run to test their hypothesized relationships. The study found that both competitive intensity and regulatory regime positively increase the effect of market innovation on competitive advantage. It was also found that the interaction between competitive intensity and regulatory regime has a positive effect while the interaction between customer demand and regulatory regime dampens the positive relationship between market innovation and competitive advantage creation. The concurrent occurrences of the three factors were found to have a negative moderating effect.

Feshchuk (2017) studied the effect of innovation strategies on the performance of ICT-industry's companies. The study focused on internal resources, experience on the market, investments and business environment innovations. The sample included 22 ICT companies from North America, EU and Asia region. The study examined data covering a period from 2011 to 2015. The study used the mixed research design and found that investments in R&D and business environment have significant impact on the performance of innovative activities. The results suggest that large established ICT companies are less efficient in studied categories than the smaller and younger ICT firms. Moreover, the younger and smaller companies showed higher efficiency in terms of such outcomes and in R&D intensity plus number of published patents.

Simiyu (2013) conducted a study on market innovations adoption by commercial banks in Kenya. The study findings revealed that commercial banks had adopted several market innovation strategies including creating and nurturing strong brands, aggressive anti-competitors marketing, creating value through pricing, environmental analysis and response to changes, customer satisfaction and retention. As an outcome the study found out that market innovations adoption had helped banks earn incremental profit, faster business growth, and improved firm's productivity. The study concluded that market innovations strategies adopted by the banks were successful market philosophies (way of doing things), vision, and performance evaluation, shared commitment by everyone in the organization and clear communication leading to successful strategies.

YuSheng and Ibrahim (2020) studied innovation capabilities, innovation types, and firm performance: evidence from the banking sector of Ghana. Findings from this study revealed that the innovation dimensions that contribute to bank innovation are organizational, product, process, and marketing innovations. In addition, findings from this study showed a positive relationship between innovation capability and the four dimensions of innovation (organizational, product, process, and market innovations). Also, the findings revealed a significant and positive relationship between the dimensions of innovation (market, process, and product innovations) and firm performance. On the other hand, Kingiri and Fu (2019) sought to

understand the diffusion and adoption of digital finance innovation in emerging economies: M-Pesa money mobile transfer service in Kenya. The analysis exposed key systemic functions that characterize M-Pesa rapid diffusion in Kenya. The study found that technological innovation system framework could be applied to explain the diffusion and uptake of a new technology. The study concluded with policy recommendations towards stimulation of key functions that may support diffusion of digital financial innovations in emerging economies.

2.5.4 Technological Innovation Strategies

Yunis, El-Kassar and Tarhini (2017) carried out a study on impact of ICT-based innovations on organizational performance and the role of corporate entrepreneurship. The purpose of the study was to develop and test a framework that would depict and examine the nature of the relationship between ICT use and organizational performance in the Lebanese market, taking into consideration the impact that innovation and corporate entrepreneurship may have on this relationship. The study hypothesized that ICT and ICT-based innovations present huge opportunities for organizations of all kinds. Corporate entrepreneurship is thus needed to take these opportunities and make use of them to respond to environmental changes and realize sustainable competitive advantage. To investigate the proposed model a survey targeting employees, department heads, and managers who adopted ICT applications in SMEs located in Lebanon was conducted. The findings of the study indicated that ICT and innovation are strategic resources. However, their contribution to sustainable competitive advantage vitally depends on the implicitness and entrepreneurial behaviors of those involved. It is through this capability that ICT and ICT based innovations could make a difference in organization's performance both present and future

Tajuddin, Iberahim and Ismail (2015) in their study explored the relationship between technological innovation and organizational performance in the construction industry in Malaysia. The instruments in measuring technological innovation and organizational performance specific to the construction industry were developed by adapting measures introduced by several scholars in these fields. Technological

innovation was represented by innovative design solutions, innovative project practices and advanced technology utilization. Organizational performance was represented by project and business performance. Contractors and consulting companies were the sampling frame of this study and the samples were selected based on a stratified sampling method to gauge representation of the different groups in the population. The results revealed that technological innovation is significantly positive in influencing organizational performance. Nevertheless, innovative design solution and advanced technology dimensions were insignificant in influencing project performance and business performance respectively.

Wason and Bichanga (2014) assessed the technological innovation practices embraced by small and medium ventures in Nairobi Region. They established that SMEs in Nairobi County use technological innovation as a strategy in global entrepreneurship. The study concluded that SMEs in Nairobi use technology management as a strategy in global entrepreneurship. Malhotra and Singh (2009), in their study on the impact of internet banking on bank performance and risks, found out that on average internet technology-savvy banks are larger, more profitable and are more operationally efficient. Additionally, it was found that internet-savvy banks have higher asset quality and are better managed in lowering expenses. They further found out that smaller banks that adopt internet banking have been negatively impacted on profitability.

Haabazoka (2019) did a study of the effects of technological innovations on the performance of commercial banks in developing countries-A case of the Zambian banking industry. The study looked at innovations in the area of Internet Banking, Mobile Banking and Automated Teller Machines (ATMs). The innovations were studied in relation to their effect on the commercial bank's performance as measured by the income. The study in general findings revealed that bank technological innovations had a positive effect on the financial performance of commercial banks in Zambia. Findings also established that mobile banking transactions had a strong positive influence on the financial performance of commercial banks while Internet banking transactions had a weak relationship with the financial performance with automated teller machine transactions having strong positive effect on the financial

performance of the financial performance of commercial banks in Zambia. Osano (2019) investigated the role of global market strategy on the global expansion of Kenyan firms. The key findings indicated existence of a functional relationship between global market strategy and global expansion of SMEs

Covin et al. (2020), studied Individual and team entrepreneurial orientation and scale development and configurations for success. While entrepreneurial orientation (EO) has traditionally been defined and operationalized as a firm-level phenomenon, recent studies extended the construct to the individual-level (IEO). The study theorized how teams might draw on the EO of their individual members, forming Team EO, and posed that EO would manifest in corollary attitudes and behaviors among employees to enable its organizational pervasiveness. Building on social exchange theory, of organizational citizenship and extra-role behavior, the study conceived and explored how risk-taking, proactiveness, and innovativeness within a team, in conjunction with its trust in the manager and commitment to company goals, affect performance. Results from an fsQCA analysis with 71 teams from a large service-sector company showed that proactiveness and innovativeness serve as substitutes and need to be combined with a commitment to company goals to achieve high performance.

Donbesuur, Boso, and Hultman (2020) studied the effect of entrepreneurial orientation on new venture performance, contingency roles of entrepreneurial actions. The study examined the EO–performance relationship by drawing insights from the intention–behavior model to argue that the effect of EO on new venture performance is contingent on entrepreneurs' actions (i.e., opportunity discovery, business networking, and institutional support seeking). This study tested this argument using structural equation modeling on a sample of 229 new ventures in a sub-Saharan African country. The findings show that entrepreneurial opportunity discovery fully mediates the relationship between EO and new venture performance and reveals how this indirect effect relationship is strengthened when business networking and institutional support increase. Elsewhere, Lomberg, et al. (2017) carried out a study on entrepreneurial orientation and the dimensions' shared effects in explaining firm performance. The study explored on the structure of the

relationship between entrepreneurial orientation (EO) and firm performance and how this relationship varies across contexts. Using commonality analysis, the study aimed to decompose the variance in performance in terms of the effects of innovativeness, proactiveness, and risk taking into parts that are attributable to unique variations in these dimensions (unique effects) and those attributable to covariation between these dimensions (shared effects). By demonstrating the empirical relevance of unique, bilaterally shared, and commonly shared effects in a heterogeneous sample of low tech, high tech, and multisector firms, the study consolidated existing conceptualizations of EO and proposed an extension of the extant theoretical views of the construct.

Meekaewkunchorn et al. (2021) did a study on entrepreneurial orientation and SME performance and the mediating role of learning orientation. The study aimed to address the mediating effects of learning orientation on the relationships between three dimensions (innovativeness, proactiveness, and risk-taking) of entrepreneurial orientation on SMEs' performance in Thailand. The study was based on a survey, utilizing a sample of 379 SME managers in the manufacturing sector of Thailand. The data collected were analyzed using the partial least square structural equation modeling (PLS-SEM) technique. The results of the proposed model proved that innovativeness, proactiveness, and risk-taking ability of SMEs have a significant positive influence on the learning orientation and business strategy of firms. Further, the results of indirect effects showed that learning orientation and business strategy mediates between the positive relationship of dimensions of entrepreneurial orientation and firm performance.

Martens et al. (2018) did a study based on linking entrepreneurial orientation to project success. The study developed and tested a model of the relationship between entrepreneurial orientation and project success in Brazilian context. As quantitative research, a survey was used to collect data. A sample of 100 valid answers from project practitioners was treated through the structural equation modeling method. As research implications, the main result pointed out the positive correlation between the entrepreneurial orientation and the project success. In practical terms, understanding that innovativeness, risk taking, proactiveness, autonomy and

competitive aggressiveness (the dimensions of the EO) can contribute to project success and can also indirectly impact on organizational performance, could help organizations get competitive advantage when developing correlate factors. Finally, the results suggest that practices of project management can be aligned to the firm's entrepreneurial orientation to enable firms to attain better results in their projects and generate a competitive advantage. Additionally, Donbesuur, Boso and Hultman (2020) Did a study on the effect of entrepreneurial orientation on new venture performance: Contingency roles of entrepreneurial actions. The study examined the EO performance relationship by drawing insights from the intention behavior model to argue that the effect of EO on new venture performance is contingent on entrepreneurs' actions (i.e., opportunity discovery, business networking, and institutional support seeking). The study tested this argument using structural equation modeling on a sample of 229 new ventures in a sub-Saharan African country. The findings showed that entrepreneurial opportunity discovery fully mediates the relationship between EO and new venture performance and reveals how this indirect effect relationship is strengthened when business networking and institutional support increase.

A study by Claudine and William (2017) examined how the relationship between entrepreneurial orientation and firm growth is shaped by learning orientation in technologically sophisticated environments. The study drew upon an information processing perspective that emphasized alignment between information processing demands and support mechanisms. Using data from 116 small to medium-sized enterprises in the Netherlands, the study observed that the ability of entrepreneurial orientation to drive firm growth greatly depends on the joint consideration of technological sophistication and learning orientation. Advancing on this, Anderson, Covin and Slevin (2009) explored the relationship between strategic learning capability, a firm's proficiency at generating, and then acting on, strategic knowledge and entrepreneurial orientation (EO). While theory posited the inevitability of building strategic learning capability from behaving entrepreneurially, there was found little empirical research to validate this proposition and even less understanding of how and why entrepreneurial orientation contributes to strategic learning capability. Empirical results from 110 manufacturing firms confirmed the

direct effect of entrepreneurial orientation on strategic learning capability, and support was found for three constructs, structural organicity, market responsiveness, and strategy formation mode that fully mediate the entrepreneurial orientation strategic learning capability relationship.

2.5.6 Firm Performance

Nowadays, continuous performance is the objective of any firm (Tomal & Jones,2015). This is because it is only through performance that companies are able to experience development and make progress. Most companies are seeking to improve their performance in any way possible. Firm performance is the single most important driver of a company's success, as it indicates the company's ability to implement plans that meet institutional goals (Almatrooshi et al., 2016).

According to Nyaega, Marangu and Chepkorir (2015) the environment of telecommunication industry, especially Data Service markets have experienced tremendous changes. Due to market competition, most Data Service providers (DSP) have seen their revenues drop over time. Up to fifty percent of this drop may be attributed to losing customers to competition or simply churn. Churn management has been a big concern for most DSP's which have put in place various measures to control churn including a dedicated department for Customer Relationship Management (CRM), whose focus is on containing customers. Many of the service providers are therefore facing a threat to profit sustainability. As market players' increase and diversify their products, the market share reduces causing decrease in profit (Nyaega, 2015). On the flip side, the growing number of service providers have led to many challenges to data service providers in Kenya (Ocharo, 2014). Since the year 2000 there have been seven major data service providers in Kenya; Safaricom, Airtel, Zuku, Orange, Faiba, Access Kenya and Kenya Data Networks which is now liquid telecom. Kenya Data Networks formerly known as KDN was bought by Liquid telecom based in South Africa. In late 2015, Orange network also expressed intention to leave the market (Wainaina, 2016). This shows that the level of competition in local calls and inter-exchange carriage has forced majority of the

data service providers to quit from the markets. Those who fortunately survived were forced to adopt competitive strategies so as to remain relevant in the market.

Focusing on industry environment for DSPs, Arasa, and Gathinji (2014). argues that there has also been a significant change in priority issues for data service providers in Kenya since the landing of the first optic fibre cable connecting the country to the international submarine network in 2009. Before then, the lack of bandwidth and high costs of connectivity resulting from dependence on satellite infrastructure were unquestionably the most significant issues in the country's data service environment. Since the arrival of competing submarine cables, priorities in access and infrastructure have shifted towards ensuring that the newly available connectivity is accessible countrywide and available at affordable prices, leading to infrastructure investment by the government and telecommunications operators and to steps by the regulator CAK to reduce end-user tariffs (Arasa & Gathinji, 2014).

According to the Communication Authority of Kenya Quarterly Sector Statistics Report, Second Quarter for the Financial Year 2020/2021, the data/internet market in the country continued to register remarkable growth. Data and Broadband Services for 2020/21 Financial Year, registered positive growth in the Internet/data market with rising dependence on digital platforms for work, learning, healthcare, shopping and entertainment. The total data/Internet subscriptions rose by 4.8 percent to 43.5 million, from 41.5 million subscriptions reported last quarter with mobile data subscriptions accounting for 98.5 per cent of the total subscriptions. During the period July to September 2020, Safaricom PLC lost 1.2 percentage points in market shares for mobile data subscriptions to record the highest share at 67.5 per cent. Similarly, Equitel lost 0.1 percentage point to post the least market share of 0.3 per cent. On the other hand, Airtel Networks Limited and Telkom Kenya Limited gained by 0.8 and 0.4 percentage points to record 26.8 and 5.4 per cent shares, respectively. This shows a continued trend in performance gaps among individual firms. On the other hand, the fibre-to-the-office/home data/Internet subscriptions recorded the highest number of broadband subscriptions, whereas fixed wireless recorded the highest number of narrowband subscriptions during the reference period. This reinforces the findings by Nyaega, Marangu and Chepkorir (2015), who observed

that the environment of telecommunication industry, especially Data Service markets have experienced tremendous changes due to market competition, resulting in many Data Service Providers (DSP) recording revenue drop over time (Oteri, Kibet, & Ndung'u, 2015).Thus, Taouab, and Issor (2019) state that, competing in a continuously changing environment is very necessary to comprehend and monitor performance and the winning card can be held by those who endeavor to innovate, to obtain and sustain performance.

In advancing knowledge on causal factors of firm performance, Taouab, and Issor (2019) carried out a study on Firm performance, Definition and measurement models. The study observed that, the changing environment which characterizes the global economy today, firms face severe competitive pressure to do things better, faster, and low-priced. Firms need to cope with a growing number of challenges arising from their environment, and also increase their ability to adapt. The winning card can be held by those who endeavor to innovate, to obtain and sustain performance.

The currency of internet-driven service delivery is key to successful business performance of service firms. This underscored by Šaković-Jovanović et al. (2020) who did a study on the relationship between E-commerce and firm performance and the mediating role of internet sales channels. The study postulated that the effect of e-commerce on firm performance is not direct and needs to be examined using mediating factors. The Ordinary Least-Squares (OLS) model was employed with the data of the Flash Eurobarometer 439 Survey entitled The Use of Online Marketplaces and Search Engines by small and medium enterprises. The obtained findings provided support for the mediating hypothesis. Precisely, the study found that while the relationship between e-commerce and firm performance is negative, it was positively mediated by certain types of internet sales channels. In particular, the benefits of e-commerce in terms of higher sales were more pronounced when firms use commercial websites and online marketplaces. On the other hand, the interaction between e-commerce and search engines was found to have insignificant effect on firm performance.

Confirming the impact of the internet on firm performance, a study by Fernandes et al. (2019) looked at the internet and Chinese exports in the pre-Ali Baba era, analyzing, the dramatic expansion of internet access in China, and the impact of the internet on firm performance. The study combined firm-level production data with province-level information on internet penetration, and examined how the internet rollout across Chinese provinces in 1999–2007 influenced firm export behavior. The study concluded that the internet rollout boosted firm manufacturing exports, even before the rise of major e-commerce platforms. The study took a closer look at why, addressing three questions: what aspects of firm performance were affected, what types of firm communication were facilitated, and what dimensions of the new communication medium were relevant. The study found that the internet did not just enhance trade but improved overall firm performance.

The studies as observed above highlight that innovation has been empirically linked with superior performance (Winand & Hoeber, 2017) as Crossan and Apaydin, (2010) have argued that highly innovative new products would lead to superior performance.

2.6 Critique of Existing Literature Relevant to the Study

Improving business performance is regarded as one of the most crucial objectives for organizations. One area that continues to generate great scrutiny is the impact of innovation strategies on a firm's performance. There is a rich body of literature on antecedent capabilities and causal effects on improved firm performance (Fernandes et al., 2019; Šaković-Jovanović et al., 2020; Nyaega, Marangu and Chepkorir 2015; Taouab, and Issor. 2019) While most of these studies have focused on strategies based on traditional product innovations, disruptions caused by digital technologies leading to positive business changes and new opportunities have not been comprehensively studied.

In understating the role of process innovations on firm growth, Goedhuys and Veugelers (2012), using World Bank ICS data from Brazilian manufacturing firms, identified process innovation strategies of firms in particular internal technology creation (make) and external technology acquisition (buy) and their effect on

successful process and product innovations. The findings reinforced that successful process and product innovations occur mostly through technology acquisition mostly embodied in machinery and equipment, either alone or in combination with internal technology development. The option of only relying on internal development was found less performing. The study did not consider internal process of entrepreneurial orientation capabilities that this study finds as the soul behind innovation expansion.

Piening and Salge (2015) did a study on "Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective". The study findings suggested that by engaging in a broad range of different innovation activities, firms can indeed increase the likelihood of achieving process innovation success, which is in turn positively related to firm financial performance. This study did not consider broader spectrum of technology, product and service innovations. Elsewhere, Muharam, Andria & Tosida (2020) carried out a study on effect of process innovation and market innovation on financial performance with moderating role of disruptive technology. The result of the study highlighted existence of a positive relationship between process innovation, market innovation and financial performance of firms. While, results indicated that disruptive technology moderate the relationship of process innovation with financial performance, the study did not consider other parameters of firm performance beyond financial performance. On the other hand, Nwankpa, Roumani and Datta (2022) did a study on process innovation in the digital age of business: the role of digital business intensity and knowledge management. While the study revealed a positive link between digital business intensity and process innovation, the study failed to consider, a linkage market management as an essential pull strategy for process innovation which this study considers pivotal for business intensity and growth. Other studies for example, (Maina, 2016, Kariuki ,2014 and Ndungu, and Moturi (2020) aimed to identify the determinants that influence uptake of mobile financial technology (Fintech) and propose an appropriate model for uptake of mobile Fintech within the sector. This study established that technology factors, environmental characteristics and organizational factors have a strong influence on the uptake of mobile Fintech. The situation study variables of these studies were however different from this study.

Anning-Dorson (2016) studied Interactivity innovations, competitive intensity, customer demand and performance. The study found that deployment of high levels of interactivity innovations in high-demand periods is significantly related to high performance. In addition, Kuncoro and Suriani (2018) carried out a study on achieving sustainable competitive advantage through product innovation and market driving. The study found that product innovation, market driving significantly affects sustainable competitive advantage. Tavassoli and Bengtsson (2018) analyzed the effect of business model innovation (BMI) on the product innovation performance of firms, based on a dynamic capabilities theoretical framework. Business model innovation was found to be significantly and positively associated with superior product innovation performance. The study recommended that managers should frame and align product innovations in business model innovation context, i.e., dynamically adapting product innovations with process, marketing and organization innovations. Tavassoli and Karlsson (2015) analyzed innovation strategies of firms in Sweden for the period between 2002 and 2012 utilizing sixteen advancement techniques, which were made out of Schumpeterian 4 sorts of developments, (process, item, advertising, and authoritative). The study found that organizations are not homogenous in picking advancement systems; rather, they have an extensive variety of inclinations with regards to advancement procedure. Ibekwe (2021) carried out a study on the effect of financial innovations on the performance of deposit money banks in Nigeria. The results of the study indicated that automated teller machine, mobile banking and point of sales had positive and significant effect on return on asset while internet banking had negative and insignificant effect in return on asset. The study thus concluded that financial innovation had positive effect on the profitability of commercial banks in Nigeria. These studies failed to extend focus on other digital avenues and possibilities of innovations derivable in digital technology.

Ndubisi and Nataraajan (2016) carried out a study on marketing relationships in the new millennium B2B sector. In highlighting the findings, the study echoed the role of marketing relationships as an appropriate response to the challenges of the new millennium business environment while an organization that has honed the skill of managing knowledge can respond successfully to the challenges of the new

economy. Further, Anning-Dorson, Hinson and Amidu (2018) carried out study on managing market innovation for competitive advantage and how external dynamics hold sway for financial services. It was also found that the interaction between competitive intensity and regulatory regime has a positive effect while the interaction between customer demand and regulatory regime dampens the positive relationship between market innovation and competitive advantage creation. These studies were done outside the context of this study therefore different in scope and perspective.

Feshchuk (2017) studied the effect of innovation strategies on the performance of ICT-industry's companies. The study focused on internal resources, experience on the market, investments and business environment innovations. As an outcome, the study found out that market innovations adoption had helped banks earn incremental profit, faster business growth, and improved firm's productivity. YuSheng and Ibrahim (2020) studied innovation capabilities, innovation types, and firm performance: evidence from the banking sector of Ghana. Findings from this study revealed that the innovation dimensions that contribute to bank innovation are organizational, product, process, and marketing innovations. On the other hand, Kingiri and Fu (2019sought to understand the diffusion and adoption of digital finance innovation in emerging economies: M-Pesa money mobile transfer service in Kenya. The analysis exposed key systemic functions that characterize M-Pesa rapid diffusion in Kenya. The study found that technological innovation system framework could be applied to explain the diffusion and uptake of a new technology. The study concluded with policy recommendations towards stimulation of key functions that may support diffusion of digital financial innovations in emerging economies. These studies however focused largely on ICT-industry's companies, and banks and not on data provision service based firms where contemporary digital technologies such as e-commerce have become critical for a firm's competitiveness and survival (Benitez et al., 2018).

Yunis, El-Kassar and Tarhini (2017) carried out a study on impact of ICT-based innovations on organizational performance and the role of corporate entrepreneurship. The findings of the study indicated that ICT and innovation are strategic resources. Tajuddin, Iberahim and Ismail (2015) in their study explored the

relationship between technological innovation and organizational performance in the construction industry in Malaysia. The results revealed that technological innovation is significantly positive in influencing organizational performance. Mallinguh, Wasike and Zoltan (2020), examined the effect of technology acquisition and SMEs performance and the role of innovation, export and the perception of owner-managers. The study found that the proportion of the capital budget allocated for the acquisition of technology positively and significantly influences sales. On the other hand, moderated mediation suggested that the perception of firm owner-managers towards the availability of formal credit moderates the mediated relationship between the capital budget's portion spent on technology and sales as mediated by innovation activities. Haabazoka (2019) did a study of the effects of technological innovations on the performance of commercial banks in developing countries-A case of the Zambian banking industry. The study findings revealed that bank technological innovations had a positive effect on the financial performance of commercial banks in Zambia. Osano (2019) investigated the role of global market strategy on the global expansion of Kenyan firms. The key findings indicated existence of a functional relationship between global market strategy and global expansion of SMEs the study results are notable when considering the organizational context in which they were acquired. However, the majority of research on technological innovations have been conducted outside, the industry of data service providers' context and subsequently the importance of studying technological innovations and performance antecedents of data service providers in Kenyan context is essential as it allows researchers to compare and examine innovations in similar environmental contexts

In extending research on entrepreneurial orientation, Covin et al. (2020), studied Individual and team entrepreneurial orientation and scale development and configurations for success. The study results showed that proactiveness and innovativeness serve as substitutes and need to be combined with a commitment to company goals to achieve high performance. Donbesuur, Boso, and Hultman (2020) studied the effect of entrepreneurial orientation on new venture performance, contingency roles of entrepreneurial actions. The study consolidated existing conceptualizations of entrepreneurial orientation. Meekaewkunchorn et al. (2021) did a study on entrepreneurial orientation and SME performance and the mediating role

of learning orientation. The results of indirect effects showed that learning orientation and business strategy mediates between the positive relationship of dimensions of entrepreneurial orientation and firm performance. Martens et al. (2018) did a study based on linking entrepreneurial orientation to project success. The study developed and tested a model of the relationship between entrepreneurial orientation and project success in Brazilian context. As research implications, the main result pointed out the positive correlation between the entrepreneurial orientation and the project success. A study by Claudine and William (2017) examined how the relationship between entrepreneurial orientation and firm growth is shaped by learning orientation in technologically sophisticated environments. The study observed that the ability of entrepreneurial orientation to drive firm growth greatly depends on the joint consideration of technological sophistication and learning orientation. The performance and effect implication of entrepreneurial orientation (EO) has been the subject of extensive scholarly discussions. However, the studies failed to consider the interwoven nature of entrepreneurship and innovation that are dynamic and holistic processes where individual behaviors and organizational factors are crucial factors affecting the development of entrepreneurial and innovation behavior in an organization (García-Villaverde, 2013). This means that entrepreneurship can provide direction to the company's entire operation, serving as an integral component of a firm's strategy, and possibly as the core component of corporate strategy (De Jong, 2013)

2.7 Research Gap

Review of previous literature reveals several research gaps. (Goedhuys & Veugelers, 2012, Piening & Salge, 2015, Muharam, Andria & Tosida, 2020, Tavassoli & Karlsson 2015, Tajuddin, Iberahim & Ismail 2015, Feshchuk, 2017, Nwankpa, Roumani & Datta 2022) focused on innovations and performance by firms in different geographical contexts and the factors that promote this development. The above studies reveal a geographical gap since they were conducted in different countries and different sectors.

Despite the profusion of innovation reviews, there is lack of reviews on how Data Service Providers can enable service innovations, ushering in digital based technologies for transformational processes whereby a company can shift from a product-centric to a service-centric business model. Digitization of services is dramatically affecting firms' strategies. In particular, technologies in the internet are offering firms the possibility to manage product functions, remotely and globally, enabling the design of innovative business models. Firms presented with an array of opportunities through provision of data services can harness the evolution of a new internet-based business model in parallel with its extant one.

Much of the research work on strategic innovations for improving firm performance focuses on introduction of new products and processes separately and not how they interrelate to achieve a positive effect on firm performance (Camisón & Villar-López, 2014). Additionally, most of these studies do not consider a wider scope of constructs in explaining firm performance. Whilst its widely accepted that causal effect of innovations is improved performance, multifaceted constructs would explain it more strongly. There exist contextual and objective gaps on studied effects of innovation strategies for organization performance for example, (Ndungu & Moturi, 2020, Maina, 2016, Kuncoro & Suriani, 2018, Tavassoli & Bengtsson,2018, Tajuddin, Iberahim & Ismail, 2015). This study will comprehensively analyze and consolidates the effects of the process, product, technological and market innovations strategies on performance of data service providers with entrepreneurial orientation as a moderator. By identifying the relationships between innovations strategies, entrepreneurial orientation and performance, of Data Service Providers in Kenya, the research seeks to find the place of internet based innovations in influencing performance. Moreover, the study will try to explain why data service providers' offerings should transcend mere data provision.

2.8 Summary of the Literature Reviewed

The chapter elaborates on the theoretical background and conceptual framework through extensive literature review. The literature highlights the theories relevant to innovation strategies and firm performance; Schumpeter Theory of Innovation,

Diffusion of Innovation Theory, Open Innovation Theory, Disruptive Innovation Theory, Resource Based View (RBV) all point to how innovation strategies influence firm performance. The said theories relate to tenets of literature on innovation strategies, entrepreneurial orientation and performance of Data Service Providers (DSP) in Kenya. The empirical review highlights studies that have been done by other scholars in the field. From the literature, it is evident that innovation is a key strategic element in most organizations and is considered to have a direct effect on organization performance. Reviewed literature avers the importance of continuous innovation in the world of hyper-competition characterized by changing markets that can significantly induce improved firm performance and sustained competitive advantage.

The empirical review explores facets of innovation strategies and consequent influence on firms' performance. The proceedings point to innovation process taking various forms: Process innovation that denotes improving the production and logistic methods or bringing significant improvements in the supporting activities, Product innovation strategies that involve the presentation of a product or a service that is new to the market or has been altogether enhanced in connection to its attributes and market innovation strategies that involve the implementation of new marketing methods and models that would, significantly change the product design or packaging, product placement, offering or pricing. On the other hand, technological innovation is viewed as the conduit of changes that reflect positively on the performance of the companies.

Concisely, this study has been one of broadening this discussion and take into account changes in the firm's marketing strategy processes in delivery of services as forms of innovation strategies (Process Innovation) that link to products offerings (Product innovation) and use of digital technology innovations (Technological innovations) where emergence of major e-commerce platforms can further opportunities for innovations and create a market pull for service products. Ultimately markets (constituting market innovation) are viewed as informing innovation opportunities to make them acceptable and profitable. Entrepreneurial orientation has been conceptualized as comprising three dimensions namely;

innovativeness, risk-taking and pro-activeness (Frank, Kessler, & Fink, 2010). There is synthesis perspective with innovation in the sense, numerous studies have confirmed that there was a significant relationship between proactiveness and various aspects of innovation (Gudda, 2017).

The literature covers on how each independent variable; innovation strategies and how they affect performance of Data Service Providers in Kenya. This led to the suggestions that firms intending to achieve high performance should pursue effective innovation strategies. The next chapter outlines the methodology to be used in this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter sought to describe the methodology and procedures which was adopted in carrying out the study. It set out various stages and phases that were followed in completing the study and the overall scheme and plan conceived to aid the study in answering the research question. In the chapter, the research identified the research design, research location, target population, sampling and sampling technique, data collection, pilot test, reliability and validity of instruments, data collection procedures and data analysis and presentation.

3.2 Research Design

Research design is the blue print for the collection, measurement and analysis of data (Zikmund, Babin & Griffin, 2010). It is a plan and structure of investment conceived so as to obtain answers to research questions (Kothari, 2014). This study utilized a descriptive research design. According to Creswell (2013), descriptive research design is a method of collecting data by interviewing or administering a questionnaire to a sample of individuals which can be used when collecting information about peoples' attitudes, opinions, habits or any other social issues. Sekaran and Bougie (2011) point out that descriptive research is critically important in the understanding of the characteristics of a group in a given situation, assisting in systematic thinking about aspects in a given situation and offering ideas for further probe and research and moreover helps in making certain simple decisions.

Descriptive research design is an efficient method of for systematically collecting data from broad spectrum of population (Kothari, 2014). Descriptive survey makes use of collection of data through questionnaires administered to a sample quickly and efficiently, (Dörnyei & Dewaele, 2022). Descriptive survey is widely used non-experimental research designs across disciplines to collect large amounts of data from a sample population (Erickson, 2017). In essence, Shields and Rangarajan

(2013) reiterate that descriptive research design is useful in describing the features of a population that has been earmarked for study and to provide answers to research questions. The descriptive research design focuses on the frequency with which something occurs or the relationship between variables (Erickson, 2017).

The descriptive research helped to probe the effect of innovation strategies on performance of Data Service Providers by collecting the information of a set of parameters known beforehand that was desirable to collect data about (Rahi, 2017). This study benefited from descriptive design because it involves; formulation of objectives of the study, design of methods of data collection, selection of sample, collection of data and analysis of results.

3.2.1 Research Philosophy

Research philosophy refers to the assumptions and beliefs that govern the way we view the world (Saunders, Lewis & Thornhill, 2015) and can be said to be a belief about the way in which data about a phenomenon should be gathered, analyzed and used (Wang, 2012). It is the foundation of knowledge, and the nature of that knowledge contains important assumptions about view of the world.

There are two extreme philosophical views regarding knowledge and reality (schools of thought). These are Positivism Interpretivism, and Pragmatism. Positivism relates to the philosophical stance of the quantitative research and entails working with an observable social reality to produce law-like generalizations. It promises unambiguous and accurate knowledge (Elkjaer & Simpson 2011). Interpretivism, like critical realism, developed as a critique of positivism but from a subjectivist perspective. Interpretivism emphasizes that humans are different from physical phenomena because they create meanings. Pragmatism on the other hand, involves research designs that incorporate operational decisions based on 'what will work best' in finding answers for the questions under investigation (Halfpenny, 2015). Pragmatism argues that the most important determinant of the research philosophy adopted is the research question, one approach may be better than the other for answering particular questions (Saunders, Lewis & Thornhill, 2012). Pragmatism is a philosophical stance toward the formation of concepts, hypotheses, and theories and

their justification (Collis & Hussey, 2014). According to pragmatism research philosophy, research question is the most important determinant of the research philosophy. Pragmatics can combine both, positivist and interpretivism positions within the scope of a single research according to the nature of the research question (Matta, 2015).

This study is guided by pragmatism philosophy. The choice of pragmatism stance in this study was informed by the fact that pragmatism paradigm provides a philosophical standpoint compatible with methodological characteristics of both qualitative and quantitative research. Pragmatism asserts that concepts are only relevant where they support action (Kelemen & Rumens 2008). It strives to reconcile both objectivism and subjectivism, facts and values, accurate and rigorous knowledge and different contextualized experiences. It does this by considering theories, concepts, ideas, hypotheses and research findings not in an abstract form, but in terms of the roles they play as instruments of thought and action, and in terms of their practical consequences in specific contexts (Elkjaer & Simpson 2011). This argument, thematically informs the basis of the current study.

The choice of pragmatism stance in this study was reinforced by Simpson and den Hond (2020) who studied the contemporary resonances of classical pragmatism for studying organization and organizing. The study affirmed pragmatism as process philosophy and its positioning of experience as both the start and end of inquiry, arguing that in the philosophy lay invaluable groundwork for the study of organization and organizing.

Creswell (2008) affirm that pragmatism is best suited for mixed methods research approach in that the paradigm balances between quantitative research and qualitative research. The pragmatic paradigm in line with the research problem applies all approaches to understanding the problem (Creswell, 2009). The paradigm balances between deductive logic used in quantitative research and inductive logic used in qualitative research (Teddlie & Tashakkori, 2010) To this end, with the research question central to this current study, pragmatism emerges as the best philosophical stance most likely to provide insights into the research question with no

philosophical loyalty to any alternative paradigm in guiding the research methodology of this study,

3.3 Target Population

Population is the total collection of elements about which inference is made to all possible cases which are of interest in the study (Sekeran & Bougie, 2010). A target population is the totality of cases conforming to the designated specifications as required by the study (Orodho & Kombo, 2002). The target population for this study comprised of 35 data service providers in Kenya. These were the units of analysis. The target respondents (units of observation) were the 316 departmental managers of Data Service Providers in Kenya. These are the head of departments involved in the day-to-day running of Data Service provider firms and makes most of the decisions including the innovation-related decisions. The managers were selected since they had a clear and comprehensive understanding of their firms' innovation strategies. Table 3.1 outlines the distribution of the managers in the respective companies.

Table 3.1: Distribution of the Target Population

	DATA SERVICE PROVIDERS	MANAGERS
1	Wananchi Telecom Limited	15
2	Liquid Telecommunications Kenya Limited	14
3	Access Kenya Limited	10
4	Safaricom Limited	21
5	Jamii Telecommunication Limited	14
6	Swift Global	8
7	Call Key Networks Limited	7
8	Tangerine Limited Pwani Telecomms	8
9	Bidii Dot Com	8
10	Mobile Pay	6
11	Africa Online	11
12	Habarinet	5
13	Inter connect	10
14	internet Solutions	6
15	ISP Kenya	11
16	ItNet East Africa	9
17	iwayAfrica	11
18	Karibu Networks	7
19	KenyaWeb.com	10
20	SimbaNet	9
21	Mawingu Networks Limited	7
22	Argon Telecom Services Limited	8
23	Telkom Kenya Limited	15
24	Mobile Telephone Networks Business Limited	6
25	Sema Mobile Services	10
26	Airtel Kenya	14
27	Dotsavvy Ltd	5
28	Fireside Communications Ltd	5
29	Insight Technologies Ltd	6
30	C Hear (K) Ltd	5
31	Aster Global services Kenya Ltd (AGSKL)	6
32	Fibre Link Ltd	5
33	Geotel Internet Services	6
34	Enterprise Data Freedom Limited	5
35	Zuku Kenya Ltd	13
Total		**316**

3.4 Sample Size and Sampling Techniques

3.4.1 Sampling Frame

Cooper and Schindler (2011) describe sampling frame as the list of all population units from which a sample can be selected. The sampling frame of this study comprised head of departmental (HOD) managers from all the 35 Data service providers. The varied choice of different HODs was important in entrenching understating of the firms' organization strategies. In particular, the choice of HOD managers was justified as the sampling units because they had a clear and comprehensive understanding of their firms' innovation strategies.

3.4.2 Sampling Techniques and Sample Size

A sampling frame describes the list of all the units in population from which the sample was selected (Zhengdong, 2011). Polit and Beck (2009) define sampling frame as the technical name for the list of the elements from which the sample is chosen from. Therefore, sampling frame in this study is the sampling range or the list of all sampling units in the survey population. It can further be described as the source material or device from which a sample is drawn.

Sampling technique on the other hand refers to the method of selecting a sample from the population. According to Kothari (2012), sampling refers to the process of obtaining information about an entire population by examining only a part of it. Kothari (2012) further add that a formula should be used for calculating the sample size from a population. It's a random sampling technique formula to estimate sampling size (n). It is the procedure the researcher used in selecting items for the sample. Yamane (1967) provides a simplified formula to calculate sample size where n is the sample size, N is the population size and e is the level of precision at 95% confidence level. n is computed as follows:

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

N = Target population, (316)

e = the level of precision, 5%

Where n is the sample size,

$$n = \frac{316}{1 + 316(0.05)^2}$$

n = 177; Therefore, the sample size was 177

The sample size distribution is as shown in Table 3.2

Table 3.2: Sample Size

	DATA SERVICE PROVIDERS	MANAGERS	SAMPLE SIZE
1	Wananchi Telecom Limited	15	8
2	Liquid Telecommunications Kenya Limited	14	8
3	Access Kenya Limited	10	6
4	Safaricom Limited	21	12
5	Jamii Telecommunication Limited	14	8
6	Swift Global	8	4
7	Call Key Networks Limited	7	4
8	Tangerine Limited Pwani Telecomms	8	4
9	Bidii Dot Com	8	4
10	Mobile Pay	6	3
11	Africa Online	11	6
12	Habarinet	5	3
13	Inter connect	10	6
14	Internet Solutions	6	3
15	ISP Kenya	11	6
16	ItNet East Africa	9	5
17	iwayAfrica	11	6
18	Karibu Networks	7	4
19	KenyaWeb.com	10	6
20	SimbaNet	9	5
21	Mawingu Networks Limited	7	4
22	Argon Telecom Services Limited	8	4
23	Telkom Kenya Limited	15	8
24	Mobile Telephone Networks Business Limited	6	3
25	Sema Mobile Services	10	6
26	Airtel Kenya	14	8
27	Dotsavvy Ltd	5	3
28	Fireside Communications Ltd	5	3
29	Insight Technologies Ltd	6	3
30	C Hear (K) Ltd	5	3
31	Aster Global services Kenya Ltd (AGSKL)	6	3
32	Fibre Link Ltd	5	3
33	Geotel Internet Services	6	3
34	Enterprise Data Freedom Limited	5	3
35	Zuku Kenya Ltd	13	7
Total		**316**	**177**

3.5 Data Collection Instruments

As Zohrabi (2013) puts it, data collection is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes. The study used both primary and secondary data. Mkandawire (2019) emphasize that when assenting results are being sought, studies must create tightly aligned and structured instruments; present the construct in a simple, concrete, and highly contextualized manner; collect the two types of data with a minimal time gap; and estimate agreement between the approaches using consistency statistics. According to Groenland & Dana (2020), primary data is the data collected directly from first hand occurrence which has not been exposed to processing or any other handling while Zohrabi (2013) emphasize that secondary data is data collected by someone other than the user.

A questionnaire was used to collect the primary data for the study. As expounded by Kothari (2014), a questionnaire, which is a systematic tool with set questions addressing the research area, is an essential data collection tool that enables the researcher to obtain a wide range of data in a short period of time, while allowing the respondents adequate time to interact with the question sand give appropriate answers. On the other hand, Heap and Waters (2019) argue that a questionnaire is appropriate in collecting primary data due to its effectiveness in assessing diverse response and giving the respondents the autonomy to contribute to the study without biasness from the researcher. The choice of the questionnaire in this study was influenced by the nature of the problem in the Data Service Providers and dictated by the availability of time and budget just as observed by Cooper and Schindler (2011).

The questionnaire was structured in seven sections, with both open-ended and close-ended questions. The close-ended questions allowed the researcher to obtain straightforward answers to the research questions while the open-ended questions allowed the respondents to give their diverse opinions in regard to the role played by innovation strategies on the performance of data service providers. The first section of the questionnaire covered the background information of the companies and the

respondents, while sections two (2) to five (5) covered information regarding the four innovation strategies each (process innovation, product innovation, market innovation and technological innovation). The sixth section covered information regarding the moderating effect of entrepreneurial innovation while the last section had information in regard to the performance of the data service providers which was the dependent variable.

3.6 Data Collection Procedures

Data collection procedure chosen by the study was determined by the study objectives. HR and Aithal (2022) observed that the type of data collected through an appropriate instrument is informed by the purposes of the study. The questions addressed by questionnaires sought to identify the effect of innovation strategies on Data Service Providers in Kenya. Questionnaires were distributed to the target population. Prior to administering questionnaire to the selected respondents, requisite legal license was obtained from the National Commission of Science Technology and Innovation Kenya, (NACOSTI), and requisite letters requesting for permission were distributed to respondents.

Through the help of research assistants, a total of 177 questionnaires were administered to the selected respondents. Questionnaires were self-completion questionnaire administered by researcher with the help of research assistants. Respondents were asked to anonymously complete the questionnaire for immediate collection. In order to obtain information from the respondents, the study sought to address the purpose of the study and allay any fears by assuring them that the information given was strictly used for academic purposes only. The study employed the help of two research assistants, to help in administering the questionnaires to the target respondents and used drop and pick later technique.

3.7 Pilot Testing

Cooper and Schindler (2011) aver that a pilot test is a preliminary study conducted to give credence to the final study by detecting flaws, weaknesses and limitations in design and instrumentation of a data collection instrument. Apart from testing and

detecting weaknesses in design and implementation, a pilot test enables validity and reliability of research instruments to be determined (Cooper & Schindler, 2011). Kothari (2004) reiterates that a pilot test is the replica and rehearsal of the main study and brings to the light the weakness of the questionnaire and sampling technics as well. Groenland & Dana (2020) agree that the purpose of pilot testing is to establish the accuracy and appropriateness of the research design and instruments. HR and Aithal (2022) observe that the importance of the pilot test cannot be overemphasized as one will always find unambiguous questions and questions which turn out not to be relevant for eliciting the sort information.

It is therefore agreeable that the benefits of pre-testing include an opportunity to test the hypothesis, allowance for checking statistical and analytical procedures, a chance to reduce problems and mistakes in the study and the reduction of costs incurred by inaccurate instruments. To this end, Cooper and Schindler (2011) and Mugenda and Mugenda (2008) aver that a sample of at least 10% of the population is usually acceptable in a pilot study. This study therefore used 10% of the sample size which is 18 respondents (10/100*177) for the pilot study. The respondents were picked randomly from data service providers but were not included in the main study.

3.7.1 Reliability of Research Instruments

Reliability is an assessment of the degree of consistency between multiple measurements of a variable (Mkandawire, 2019). Mugenda and Mugenda (2008) affirm that reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. The greater the ability of the instrument to produce consistent results, again and again, or rather the repeatability of the measure, the greater is its reliability. The measurement of reliability provides consistency in the measurement of variables. Internal consistency reliability is the most commonly used psychometric measure assessing survey instruments and scales. Cronbach's alpha is the basic formula for determining the reliability based on internal consistency (Yin, 2013).

Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals and by using uniform testing procedures. The

following commonly accepted rules of thumb as provided by George and Mallery (2010) provided the guidance: $\alpha \geq 0.9$ – Excellent; $0.9 > \alpha \geq 0.8$ – Good; $0.8 > \alpha \geq 0.7$ – Acceptable; $0.7 > \alpha \geq 0.6$ – Questionable; $0.6 > \alpha \geq 0.5$ – Poor and $0.5 > \alpha$ – Unacceptable.

In order to test the reliability of the instruments, internal consistency techniques were applied using Cronbach's Alpha. The reliability of the study measures was assessed by computing Cronbach's Alpha coefficients for all items in the questionnaire and the overall assessment was provided for inference and interpretation. Sekaran and Bougie (2010) highlighted that Cronbach's Alpha coefficient ranges between 0 and 1 with higher alpha coefficient values of 0.7 and above being more reliable. The recommended value of 0.7 was used as a cut–off of reliability for the study. Any sub-variable with a reliability value above 0.7 was accepted while any sub-variable with a reliability value below 0.7 was discarded.

Reliability was tested using questionnaire duly completed by 18 randomly selected respondents. In order to control response biasness these respondents were not included in the final study sample. The questionnaire responses were captured into statistical package for social sciences (SPSS) and Cronbach's Alpha coefficient generated to assess reliability.

3.7.2 Validity of the Research Instrument

Validity is the ability of an instrument to measure what it is designed to measure (Yin, 2013). According to Heap and Waters (2019) validity is the correctness or credibility of a description, conclusion, explanation, interpretation, or other sorts of account. Validity requires that an instrument is reliable, but an instrument can be reliable without being valid. Heap, and Waters (2019) expands the view by suggesting that there are two approaches to establishing the validity of a research instrument: logic and statistical evidence. The study established validity by a logical link between questions and the objectives. Quintão, Andrade and Almeida (2020) add that there are dimensions from which validity can be examined. These include, content, and construct. In essence, these two dimensions were of interest to this study.

Content validity measures the inclusiveness and representativeness of the data collection instrument. The questionnaire was tested against content validity. Content validity was achieved therefore by designing instrument according to the study variables and their respective indicators of measurement. construct validity, was maintained through restricting the questions to the conceptualizations of the variables while ensuring that the indicators of a particular variable fall within the same construct. The research adopted content validity which refers to the extent to which a measuring instrument provides adequate coverage of the topic under study. This was done using the content validity index (CVI). The scale level CVI (S-CVI) was obtained by taking the average of all the item level CVI. The recommended S-CVI is 0.90 or higher. This was used to test for the internal consistency of the instrument (Orodho, 2009).

3.8 Data Analysis and Presentation

In this study, data collected using questionnaires was coded, verified for completeness and accuracy and then analyzed using quantitative approaches to derive descriptive statistics/outputs. This study used the Statistical Package for Social Scientists (SPSS version 26) to process the data. The software was used to produce frequencies, descriptive and inferential statistics which were used to derive generalizations and conclusions regarding the population. Qualitative data was analysed using content analysis, where the explanations and opinions by the respondents were thematically sorted and presented to support the quantitative data. This allowed the study to make inferences by objectively and systematically identifying specified characteristics of data flow.

3.8.1 Correlation Analysis

Correlation analysis was carried out to establish the extent to which the independent variables related with the dependent variable. According to Gogtay and Thatte (2017), correlation analysis enables the researcher to identify the overview of the existence of a relationship between variables. In this study, a bivariate correlation analysis was used where Pearson correlation coefficients and leaves of significance were used to establish how the innovation strategies related with the performance of

data service providers. Bivariate correlation tells whether and how two variables covary linearly, that is, whether the variance of one changes in a linear fashion as the variance of the other changes (Sandilands, 2014).

3.8.2 Univariate Regression Models

The univariate regression models were derived to enable testing the individual hypotheses of the study. The models were systematically presented based on the specific research hypotheses.

H_{01}: Process innovation does not have a significant effect on the performance of data service providers in Kenya

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \varepsilon} \quad \textbf{(i)}$$

Where:

Y = performance of data service providers in Kenya

β_0 = Constant

β_1 = Regression coefficient

X_1 = Process Innovation

ε = Error Term

H_{02}: Product innovation does not have a significant effect on the performance of data service providers in Kenya

$$\mathbf{Y = \beta_0 + \beta_2 X_2 + \varepsilon} \quad \textbf{(ii)}$$

Where:

Y = performance of data service providers in Kenya

β_0 = Constant

β_2 = Regression coefficient

X_2 = Product Innovation

ε = Error Term

H_{03}: Market innovation does not have a significant effect on the performance of data service providers in Kenya

$$Y = \beta_0 + \beta_3 X_3 + \varepsilon \quad \text{..... (iii)}$$

Where:

Y = performance of data service providers in Kenya

β_0 = Constant

β_3 = Regression coefficient

X_3 = Market Innovation

ε = Error Term

H_{04}: Technological innovation does not have a significant effect on the performance of data service providers in Kenya

$$Y = \beta_0 + \beta_4 X_4 + \varepsilon \quad \text{..... (iv)}$$

Where:

Y = performance of data service providers in Kenya

β_0 = Constant

β_4 = Regression coefficient

X_4 = Technological innovation

ε = Error Term

3.8.3 Overall Multivariate Regression Model

A multiple linear regression model was used to measure the relationship between the independent variables and the dependent variable. Multi-linear regression model is a statistical tool which allows for the prediction of response variables based on a set of independent variables. As opined by (Petterle et al. 2020) multi-linear regression model is a reliable statistical tool, that helps in estimating (or predicting) the unknown values of one variable from known values of another variable. The definition is in agreement with that of Kothari (2009) who describe multi-linear regression as the determination of a statistical relationship between two or more variables where one variable (defined as independent variable) is the cause of behavior of another one (defined as dependent variable).

$$\mathbf{Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon} \text{ .... } \mathbf{(v)}$$

Where:

Y = Performance

X_1 = Process Innovation

X_2 = Product Innovation

X_3 = Market innovation

X_4 = Technological Innovation

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$, = Regression coefficients of changes included in Y by each X value

ε = Error term which is normally distributed with a mean and variance of zero.

3.8.4 Testing for the Moderating Effect

The moderating variable in this study was entrepreneurial orientation. Heap and Waters, (2019). argue that estimating interaction effects using moderated multiple regression usually consists of creating an Ordinary Least Squares (OLS) model and a Moderated Multiple Regression (MMR) model equations involving scores for a continuous predictor variable Y, scores for a predictor variable X, and scores for a second predictor variable Z hypothesized to be a moderator. To determine the presence of moderating effect, the OLS model will be then compared with the MMR model. Equation (vi) shows the Ordinary Least Squares (OLS) regression equation model predicting Y scores from the first-order effects of X and Z observed scores.

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + Z + \varepsilon} \text{ ..... (vi)}$$

Equation (vii), the Moderated Multiple Regression (MMR) model is formed by creating a new set of scores for the two predictors (i.e. X, Z), and including it as a third term in the equation, which yields the following model:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 * Z + \beta_2 X_2 * Z + \beta_3 X_3 * Z + \beta_4 X_4 * \beta_5 Z + \varepsilon} \text{ ..... (vii)}$$

3.8.5 Structural Equation Modelling

To test for the specific measures of the study variables, Structural Equation Modelling (SEM) was used. According to Kline (2016), SEM is used to analyze the structural relationship between measured or observable variables and latent (unobservable) constructs. For the purposes of this study, AMOS (a statistical analysis tool) was used as the primary tool to carry out the specification of the SEM model. AMOS (Analysis of Moment Structures) is a visual statistical software embedded within SPSS, and is specially used for Structural Equation Modelling, path

analysis, and confirmatory factor analysis. It is also known as analysis of covariance or causal modelling software.

3.9 Diagnostic Tests

Okeh and Ogbonna, (2013) confirm that diagnostic tests in research are essential to address the various forms of bias that may occur in research aiming to evaluate the accuracy of the final results. To this end, diagnostic tests were conducted in this study to ensure that the assumptions of Classical Linear Regression Model (CLRM) were not violated and data was well distributed. The study tested for validity, reliability, normality, multi collinearity homoscedasticity and autocorrelation.

In conducting diagnostics tests in SPSS for the model, residual analysis was undertaken generating descriptive statistics. Residuals were plotted to generate histograms and the normal probability plot as well as residual scatterplots. In running the analysis, SPSS generated variables for each of these statistics and appended them to the existing SPSS dataset. SPSS also generated variable labels that were used for reference while differentiating the influence statistics. The researcher computed all the residuals at once by simply selecting all the boxes of interest.

3.9.1 Test for Multicollinearity

As emphasized by Groenland and Dana (2020), linear regression analysis assumes that the independent variables are not correlated with each other meaning there is no linear relationship among the explanatory variables.Thus, multicollinearity in statistics presents spectacle where there is existence of a perfect or exact relationship between independent variables hence complicating reliable estimates of their individual coefficients (Joshi, Kulkarni & Deshpande, 2012). The use of variance inflation factor (VIF), can be used to estimate multicollinearity variance by assessing how much the variance of an estimated regression coefficient increases when independent variables are correlated and the tolerance value, which is simply the reciprocal of VIF.

To test for multicollinearity this study used Variance Inflation Factor (VIF), which was calculated using SPSS. A VIF for all the independent and dependent less than 3 (VIF $\leq$ 3) indicate no Multicollinearity while a VIF of more than 10 (VIF $\geq$ 10) indicates a problem of Multicollinearity. Graphical representation was used to test the normality of the residuals. There was no multi-collinearity between the independent variables and the dependent variable as the VIF values were between 1 and 10.

3.9.2 Test for Normality

According to Moore and McCabe, (2014), Normality tests are critical in determining whether or not the data set was properly modeled by normal distribution. The assumption of normality is the supposition that the underlying random variable of interest is distributed normally, or approximately so. Intuitively, normality may be understood as the result of the sum of a large number of independent random events. The assumption of normality is often not about the variables under study, but about the error, which is estimated by the residuals.

3.9.3 Test for Linearity

Scatter plots were used to test the linear assumption in the study. There exists a linear relationship between the dependent variable (Performance) and the independent variables (Process Innovation Strategy, Product Innovation Strategy, Market Innovation Strategy and Technological Innovation Strategy). The scatter graph indicated that the residual trend was centered on zero and the variance around zero was scattered uniformly and randomly. Hence the linearity assumption was satisfied.

3.9.4 Test for Heteroscedasticity

Gujarati and Porter (2009) consider heteroscedasticity as a situation in which there is variance of the dependent variable across the data set. Test for heteroskedasticity was done using Breush-pagan/Cook-Weisberg Test. The null hypothesis in the test is that error terms have a constant variance (i.e. should be Homoscedastic). The error terms are said to be Homoscedastic, if the p value is greater than the conventional p value

0.05, otherwise the errors terms are said to be heteroskedastic. Homoscedasticity implies the relationship under investigation is the same for the entire range of the dependent variable. Homoscedasticity tests whether the variables in the study have the same finite variance also known as homogeneity of variance. Heteroscedasticity can pose a threat to the constant error term as several methods in regression analysis are based on assumption of equal variance as posited by Groenland and Dana (2020). To test for heteroscedasticity, squared residuals were used i.e. a plot of squared residuals versus any independent variable, the rule of the thumb being, when the homoscedasticity assumption is met, residuals form a pattern-less cloud of dots. Lack of homoscedasticity thereof can easily be seen in a standardized scatterplot. As pointed by David, (2012), when a scatterplot of the standardized predicted dependent variable is regressed against the standardized residuals in a scatter plot, it should clearly depict a random pattern across the entire range of the dependent variable. Visual inspection of the scatter plot confirmed homoscedasticity or heteroscedasticity as the variance around zero was scattered uniformly.

3.9.6 Test for Autocorrelation

Autocorrelation test was conducted to establish whether or not the residuals are serially correlated, Durbin-Watson test for autocorrelation was conducted. The Durbin Watson test reports a test-statistics, with a value from 0 to 4, where: 2 denotes no autocorrelation; 0 to 2<2 denotes a positive autocorrelation; while >2 denotes a negative autocorrelation. The decision rule was that test statistic values in the range of 1.5 to 2.5 were relatively normal. The DW coefficient ranged from1.574 to 1.795.

3.10 Operationalization of Study Variables

The variables of this study were operationalized as shown in Table 3.3 below.

Table 3.3: Operationalization of Study Variables

Variable	Nature	Operationalization/Indicators	Measurement Scale
Process Innovation Strategy	Independent Variable	• New Processes • Improving existing processes • Replace existing processes	Five theme Likert's ranking scale and Interval Scale
Product Innovation Strategy	Independent Variable	• New Products • Quality Improvement • Technical Specification	Five theme Likert's ranking scale and Interval Scale
Market Innovation Strategy	Independent Variable	• Differentiating pricing • New Markets • Enhancing Promotion Techniques	Five theme Likert's ranking scale and Interval Scale
Technological Innovation Strategy	Independent Variable	• New technologies & Systems • Automation of Routine Tasks • Improving Existing Technologies	Five theme Likert's ranking scale and Interval Scale
Entrepreneurial Orientation	Moderating	• Proactiveness • Understanding environment • Competitive Aggressiveness	Five theme Likert's ranking scale and Interval Scale
Performance of Data Service Providers	Dependent Variable	• Profitability • Sales Volume • Customer Base • Customer Satisfaction	Five theme Likert's ranking scale and Interval Scale

3.11 Ethical Considerations

The researcher undertook various fundamental precautions to ensure ethical standards were adhered to in the research's conduct. An authorization from the Board of Post-Graduate Studies (BPS) at Jomo Kenyatta University of Agriculture and Technology was sought and NACOSTI letter obtained to ensure authorization of the research. Later, consent for collecting information and data was sought from the owners or managers of the DSPs and the respondents through the consent form. Confidentiality of participants was guaranteed throughout the study by proper coding which encouraged a higher response rate. The online questionnaire was well

structured to gather information directly associated with the study queries. Further, acknowledgment of textbooks and journals used in the study was prudently done.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter describes the methods that were used to achieve the research objectives and moreover to provide the results of the study performed in testing the conceptual framework and research hypotheses. The broad objective of the current study was to determine the effect of innovation strategies on performance of Data Service Providers in Kenya. The research findings evaluate and summarize the response rate, reliability and validity of the survey constructs, while amalgamating the general background information of the respondents and descriptive analysis of the study variables. In summary, the chapter comprises data analysis, findings and interpretation. Results are presented in tables and diagrams. The analyzed data was arranged under themes that reflect the research objectives.

4.2 Response Rate

According to Cooper & Schindler (2011), response rate is the extent to which the final data sets include all sampled members and is calculated as the number of respondents with whom interviews are completed and divided by the total number of respondents of the entire sample including non-respondents. The sample size for the study consisted of 177 respondents from 316 managers of Data Service Providers in Kenya. Out of 177 respondents that formed the sample size, 120 questionnaires were returned correctly filled, representing a response rate of 68%. To this end, Mugenda and Mugenda (2008) argues that 50% response rate is adequate, 60% good while above 70% is rated very good. Thus, a response rate of 68% was appropriately good for drawing conclusions in the study. In congruence, Kothari (2009) opines that a response rate of 50% is considered average, 60-70% is considered adequate while anything above 70% is considered to be excellent response rate. This response rate was, therefore, appropriate representation of respondents in providing information for analysis and conclusions. The summary of the results is as shown in Table 4.1

Table 4.1: Summary of the Response Rate

Response	Frequency	Percent
Returned	120	68
Unreturned	57	32
Total	177	100

4.3 Results of Pilot Study

To test the reliability of research instruments and the validity of the study, a pilot study was done. This is in line with Mugenda and Mugenda (2008) and by expansion Cooper and Schindler (2011) who aver that 10% of the target population is appropriate for determining the reliability, validity and adequacy of the data collection instrument.

4.3.1 Reliability of Research Instruments

To test the reliability of the instruments, internal consistency techniques were applied using Cronbach's Alpha. The reliability of the study measures was assessed by computing Cronbach's Alpha coefficients for all items in the questionnaire and the overall assessment was provided for inference and interpretation. Sekaran and Bougie (2010) highlighted that Cronbach's Alpha coefficient ranges between 0 and 1 with higher alpha coefficient values of 0.7 and above being more reliable. The recommended value of 0.7 was used as a cut–off of reliability for the study. Any sub-variable with a reliability value above 0.7 was accepted while any sub-variable with a reliability value below 0.7 was discarded.

The pilot study targeted 17 respondents (about 10% of the sample size of 177 objects). The respondents were not included in the final sample. Cronbach's alpha coefficients were used to check on the reliability among multiple measures and the internal consistency of the variables of the study. Cronbach's alpha as a reliability coefficient that indicates how well the items in a set are positively correlated to one another, was computed in terms of inter-correlation among the items measuring the concept. With Cronbach's alpha above 0.7 the instrument was found reliable. The

study measures were found to be highly reliable in that they all had alpha coefficient greater than the minimum accepted Cronbach's alpha coefficient of 0.7.

Process Innovation Strategies had a coefficient of 0.826, Product Innovation Strategies had a coefficient of 0.809, while Market Innovation Strategies had a coefficient of 0.788 and finally Technological Innovation Strategies had a coefficient of 0.852. Entrepreneurial Orientation had a coefficient of 0.905 and finally Performance of Data Service Providers had a coefficient of 0.786. All the constructs depicted that the value of Cronbach's Alpha which was above the recommended value of 0.7. The results are in line with the findings of previous studies which opined that Alpha scales that are equal or greater than 0.7 indicates satisfactory reliability (Sekaran & Bougie, 2010). This in effect therefore shows that the research instrument of this study was reliable.

Table 4.2: Reliability of Test Results

Variable Description	Nature of Variable	Cronbach's Alpha	No. of Items	Verdict
Process Innovation Strategies	Independent	.826	7	Accepted
Product Innovation Strategies	Independent	.809	7	Accepted
Market Innovation Strategies	Independent	.788	7	Accepted
Technological Innovation Strategies	Independent	.852	7	Accepted
Entrepreneurial Orientation	Independent	.905	7	Accepted
Performance of Data Service Providers	Dependent	.786	6	Accepted

4.3.2 Validity of Research Instruments

Validity is concerned with whether the findings are truly about what they seem to be all about (Cooper & Schindler, 2011). According to White (2010), Content validity should be established prior to any theoretical testing. The study used Factor Analysis to validate data collected. According to Mugenda and Mugenda (2012) factor analysis is a statistical data exploration technique which is used in reducing a set of

correlated variables to a smaller number of unobserved, uncorrelated factors (Cooper & Schindler, 2011; Mugenda & Mugenda, 2012; White, 2010). Before proceeding for the field, the data collected from the pilot study was subjected to factor analysis; appropriateness of factor analysis needed to be assessed.

While it is generally agreed that loadings from factor analysis of 0.7 and above are preferable for analysis, Keraro (2014) and Leech (2011) explained that studies use 0.4 as a realistic measure if they are consistent with the theoretical labels given that 0.7 can be high for real life data to meet this threshold. To examine whether the data collected was adequate and appropriate for statistical tests, two tests were conducted. This included Kaiser-Mayor-Oklin measures of sampling adequacy (KMO) and Bartlett's Test of Sphericity. The obtained Kaiser-Meyer-Olkin measures of sampling adequacy shows that the value of test statistic is 0.617 which is greater than 0.5 (see table 4.3) implying that factor analysis should yield distinct and reliable factors. Bartlett's test of sphericity was used to test whether the data is statistically significant or not. With the value of test statistic and the associated significance level, it shows that there is a relationship among variables.

Table 4.3: Validity of Test Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.617
Bartlett's Test of Sphericity	Approx. Chi-Square	3260.590
	df	22
	Sig.	.000

Additionally, content validity index (CVI) was used to test for the validity of the data collection instrument and the results are as shown in Table 4.4. As the findings portray, scale level CVI (S-CVI) was obtained by taking the average of all the item level CVI. The S-CVI obtained for the 6 variables was 0.906 which is more than the recommended S-CVI of between 0.80 and 0.90. This implies that the instrument passed the test for the internal consistency.

Table 4.4: Content Validity Index

Variable	Number of Items	Valid Items	Content Validity Index
Process Innovation Strategies	8	7	0.875
Product Innovation Strategies	9	8	0.889
Market Innovation Strategies	8	8	1.000
Technological Innovation Strategies	8	7	0.875
Entrepreneurial Orientation	9	8	0.889
Performance of Data Service Providers	11	10	0.909
Average			0.906

4.4 Demographic Characteristics

This section analyzes the demographic characteristics of the respondents. The section presents the descriptions of the respondents in terms of their gender, level of education, age and number of years worked in respective firms. Demographic information is necessary for the determination of whether the individuals in a particular study are a representative sample of the target population for generalization purposes as posited by Connelly (2013). They help to eliminate false positives. Vogt and Johnson (2011) add that quantitative and qualitative research samples of populations ideally are collected by selecting participants randomly from the larger populations. As such, a random sample generally would have the characteristics in the same proportions as the population (Mohajan, 2020). This can produce a sampling bias or error in which some members of the population are less likely to be included than others (Vogt & Johnson, 2011).

4.4.1 Duration of Firms' Operations in Kenya

The respondents were asked to indicate the number of years the firm has been operating in Kenya. Results in figure 4.1 reveal that majority (60.8%) of the firms providing data services have been operating in Kenya for 1-5 years, 21.7% of the firms have been operating in Kenya for 5-10 years while only 16.7% of the firms have been operating in Kenya for 10-20 years. The findings imply that most of the Data Service providers have existed long enough to have an anchor on market

dynamics and thus being less myopic on requisite innovations for strategic advantage.

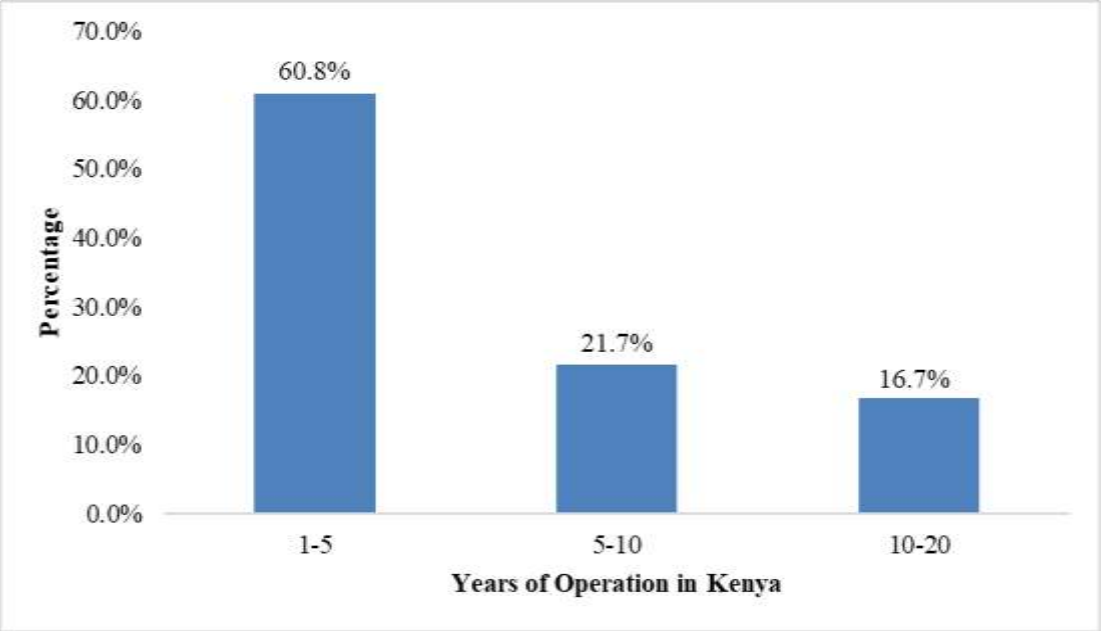

Figure 4.1: Years of operation in Kenya

4.4.2 Portfolio of Products offered by the Firms

The study sought to establish the number of products that Data Service Providers offered in the market. The findings as shown in Figure 4.2 revealed that 37.1% of the firms had only one product in the market, 41.35 had between 2 and 3 products, 13.5% of the Data Service Provider firms had between 4 and 6 products while 8.1% of the companies had more than 6 products. According to Mongkol (2021), a higher number of products is an indication of how well a firm is strategically innovating to be more diverse and have a wider market share. Moreover, Fibitz and Ulrich (2018) indicated that many service firms strengthen their sustainability in the market by having more number of products that attract a larger pool of customers.

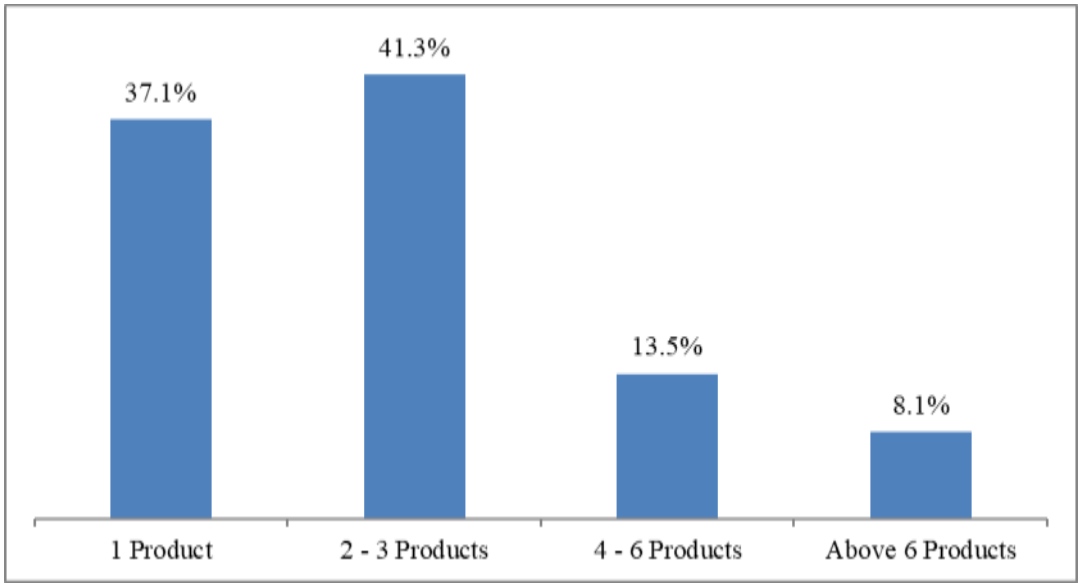

Figure 4.2: Portfolio of Products offered by the Firms

4.4.3 Capacity of DSPs' Operations in Multiple Market Segments

The study sought to establish whether Data Service Providers operated in different data service market segments. As the results on Figure 4.3 portray, 57.4% of the firms operated in only one market segment, 22.6% of the firms operated in between 2 and 3 market segments, 9.2% of the firms were in between 4 and 6 markets while 10.8% were operating in more than 6 market segments. The findings imply that few Data Service Providers have extended their operations into multiple markets, an essential opportunity for firms to have a wider knowledge on the diverse innovations that can strengthen their continued performance. According to Geiger and Gross (2018), companies operating in a larger geographic markets have the advantage of diverse experience in the market needs, and this can stimulate innovation capabilities.

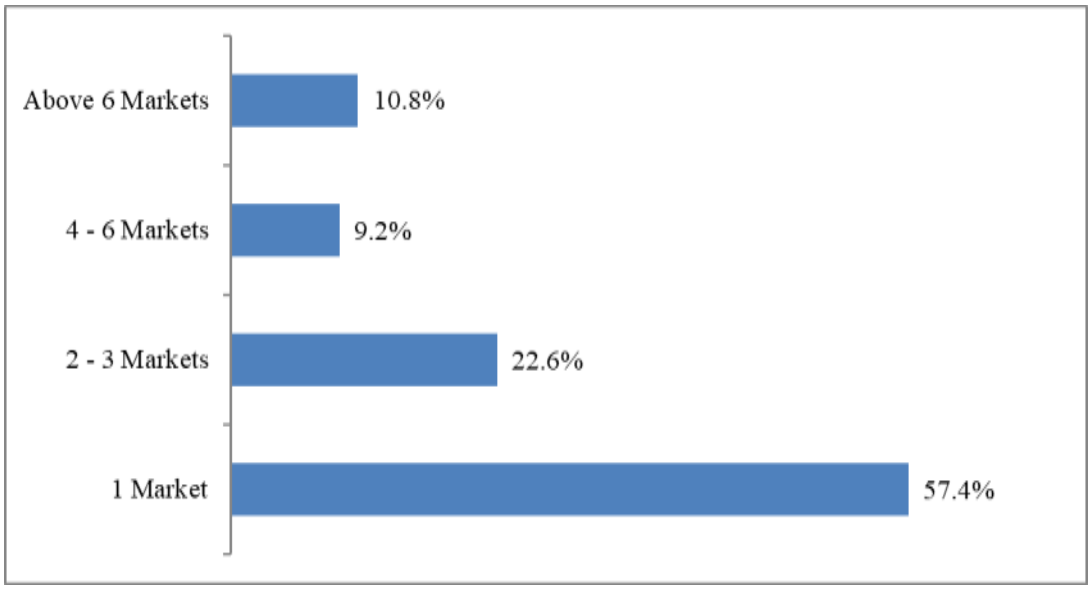

Figure 4.3: Number of Market Segments

4.4.4 Respondents' Work Experience

The study sought to investigate the number of years the respondents have been in the current job group position. Results in Figure 4.4 reveal that 53.3% of the respondents had been in the current job group position for less than 1 year, 41.7% of the respondents indicated that they had been in the current position between 1-5 years while 5% of the respondents indicated that had been in the current position for 6-10 years. The findings imply that the respondents had worked and gathered considerable experience in their respective firms to understand the firms' strategic and organizational dynamics and therefore to provide reliable information on the issues relevant to the study.

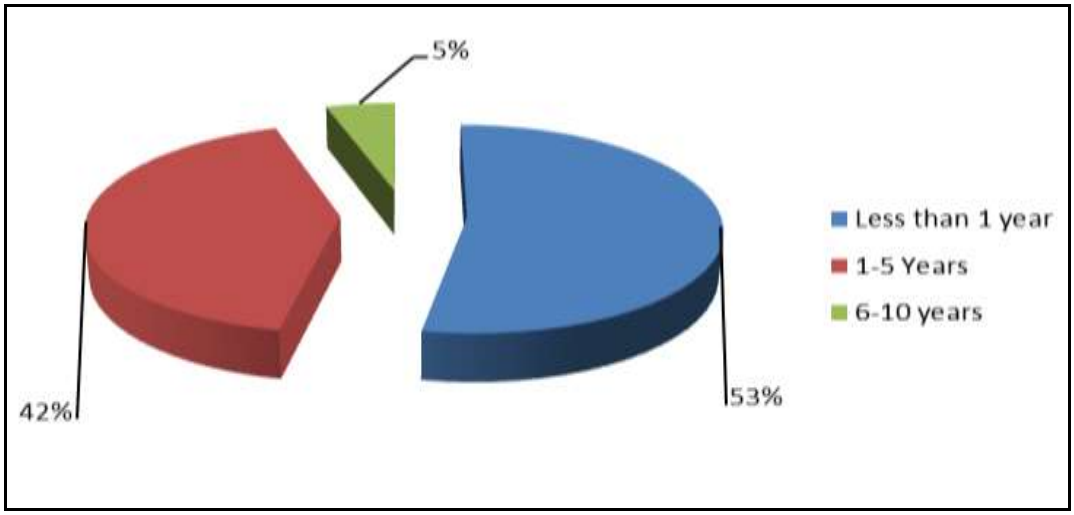

Figure 4.4: Number of years in the current position

4.5 Descriptive Analysis

Quantitative analysis provides a means of describing and explaining a phenomenon through a numerical system (Allan, 2020). Given that analysis is not based on subjective interpretation but on the objective analysis of the numerical findings derived from observations, the analysis in this study began by descriptive statistics, which helped to show or summarize data in a meaningful way, and allow a simpler interpretation of data. The study used two normally general types of statistics that are used to describe data. These include measures of central tendency and measures of spread. A measure of central tendency describes the central position of a frequency distribution for a group of data for example the mode, median and mean. On the other hand, a measure of spread is a way of summarizing data to describe how the scores are spread out. To describe this, the study used range, absolute deviation, variance and standard deviation to investigate how innovation strategies influence performance of Data Service providers.

4.5.1 Influence of Process Innovation Strategies

The study sought to investigate how process innovation strategies influence performance of Data Service Providers. The respondents were asked to indicate whether process innovation strategies influence performance of Data Service Providers based on specific statements in a five-point Likert's scale. The study

further sought to establish to what extent process innovation strategies influence performance of Data Service Providers in Kenya. The findings are presented in figure 4.5 below. From the findings, majority of the respondents (63%) said that process innovation strategies influence firm performance to a great extent, 31% said that process innovation strategies influenced firm performance to a small extent while 6% of the respondents said that process innovation strategies influence firm performance to a moderate extent.

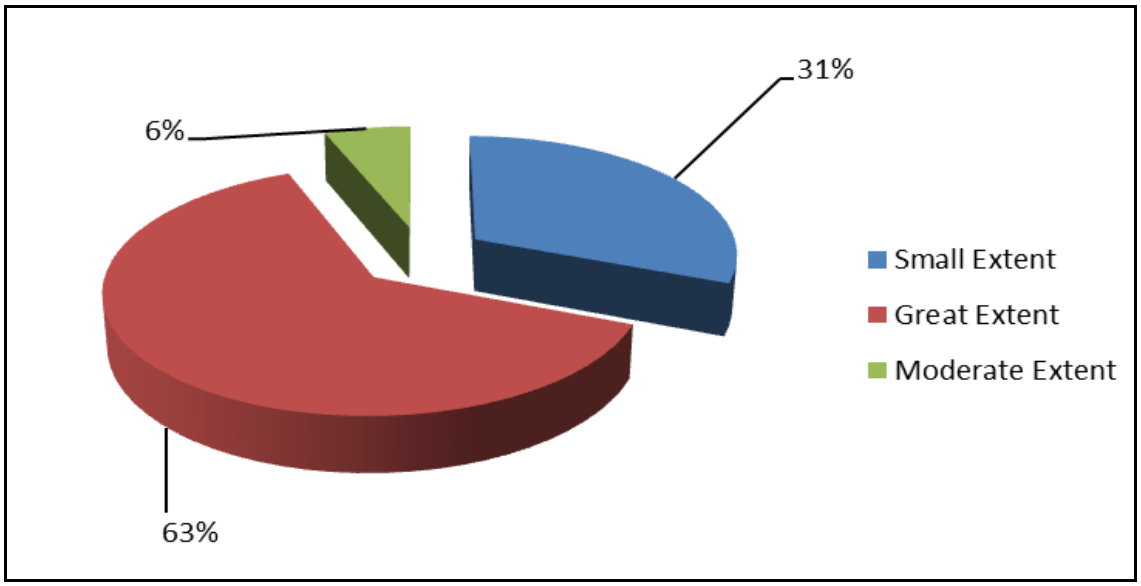

Figure 4.5: Influence of Process Innovation Strategies

The study further sought to determine the influence of process innovation strategies on the performance of Data Service Providers. The response was rated on a scale of 1-5 on which: 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree and 5= strongly agree. Table 4.5 below shows the descriptive statistics describing the data in details. From the findings, majority of the respondents in the study agreed with the statement that the firm's technical team develops new programs and process from time to time as shown by a mean score of 3.64. Respondents indicated that organization updates and improves its programs and process on regular intervals as shown by a mean score of 4.01. A majority of the respondents agreed and widely held the opinion that the organization does not hesitate to replace existing programs and processes in case of failure as shown by a mean score of 3.93.

The level of agreement was also extended to the following statements: The organization adopts modern technology in the development of new processes as shown by a mean score of 4.19. Process innovations are key to effective operation as shown by a mean score of 4.19. Organizations undertakes regular changes in their organizational structures as shown by a mean score of 4.13 and majority of the respondents in the study agreed with the statement that one of the process innovation strategies that firms adopt is changing in organizational culture.

These findings imply that process innovation is one of the major aspects of innovation that play a critical role in enhancing the performance of data service providers in Kenya. Through enhanced process and promoting efficiency and effectiveness, more sales are recorded thus promoting performance. The findings are in line with those by Herzog, Piening and Salge (2015) who found out that process innovation plays a key role in enhancing the integration of new ways of doing things in an organization. On the other hand, the study findings agree with Muharam, Andria and Tosida (2020) that there is a positive relationship between process innovation, market innovation and financial performance of firms. As stretched in the Schumpeter theory of innovation, enhancing the processes and operation procedures in a modern business creates a platform to enhance effectiveness and efficiency in service delivery and production (Schumpeter, 1934).

Table 4.5: Influence of Process Innovation Strategies and Performance

Statement	SD	D	N	A	SA	Mean	Std. Dev
Developing programs in consistence	1.7%	3.3%	38.3%	42.5%	14.2%	3.64	.828
Updates and improves programs on regular intervals	1.7%	4.2%	15.0%	50.0%	29.2%	4.01	.874
Replaces existing programs and processes when fails	3.3%	1.7%	23.3%	41.7%	30.0%	3.93	.950
Adopts modern technology in process development	1.7%	1.7%	15.8%	37.5%	43.3%	4.19	.882
Innovations strategies are key to effective operation of the organization	1.7%	5.0%	11.7%	35.8%	45.8%	4.19	.946
Regular changes in its organizational structures	1.7%	3.3%	13.3%	43.3%	38.3%	4.13	.888
Innovation strategies that firms adopt is changes in organization culture	4.2%	1.7%	8.3%	36.7%	49.2%	4.25	.981

The respondents were further asked to expound on the need for product innovation in their respective firms. From the explanations given, it was revealed that most of them perceived product innovation to be integral in promoting the continued performance of Data Service Providers. Responses from open-ended questions, affirmed that it is through innovations in delivery of services that firms were able to capture more customers and enhance firms' performance.

The findings compare with those by Tavassoli and Karlsson (2015), the process used in an organization determine the effectiveness of customer service and delivery of services or products. Agreeably, process innovation is a way of ensuring that the available processes are improved while bringing in new processes that replace those that are costlier or hectic to promote efficiency, reliability and effectiveness.

4.5.2 Influence of Product Innovation Strategies

The second objective of the study was to assess the influence of product innovation strategies on performance of Data Service Providers in Kenya. The product innovation strategies focused in the study included technical specification, improved quality and introduction of new products. The respondents were asked to indicate their opinions based on a five-point Likert's scale. The study also sought to understand to what extent product innovation strategies influenced firms' performance. The findings are presented in figure 4.6 below. From the findings, majority of the respondents (57.5%) observed that product innovation strategies influenced firm's performance to a moderate extent, while 40% indicated that product innovation strategies influenced firm's performance to a great extent and 2.5% of the respondents indicated that product innovation strategies influenced firm's performance to a small extent. The findings imply that product innovation strategies influence performance of most of the data service providers in Kenya. This compares to the findings from a study by Feshchuk (2017) who found out that product innovation paved way for new products that met the customer needs thus enhancing firm performance. In continuum, (Kuncoro & Suriani, 2018, Anning-Dorson, 2016, Tavassoli & Bengtsson, 2018, Tavassoli & Karlsson 2015) found empirical support in influence of process innovations to firm performance.

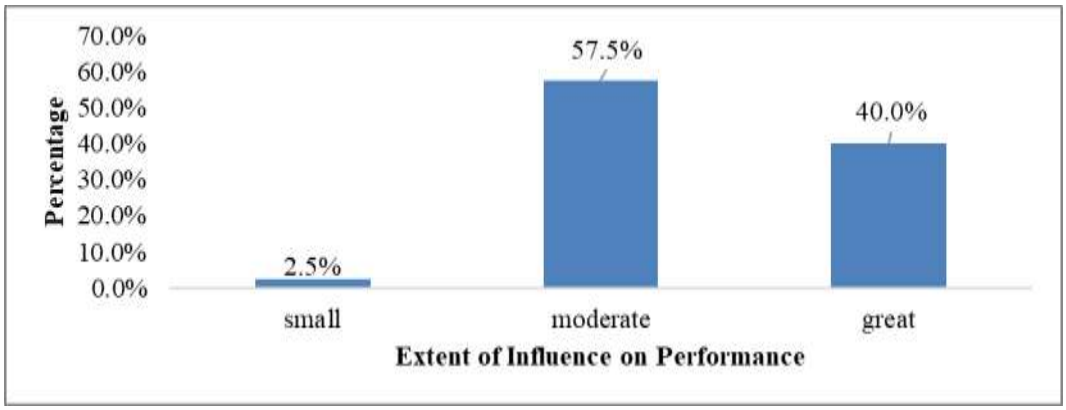

Figure 4.6: Influence of Product Innovation Strategies

The respondents were further asked to indicate their respective level of agreements on specific statements drone from the aspects of product innovation strategies. The responses were rated on a Likert's scale of 1-5 where 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree and 5= strongly agree. Table 4.6 below shows the descriptive statistics describing the data in details. From the findings, respondents in the study agreed with the statement that development of new products is essential for the growth of data service providers in Kenya. A majority of the respondents agreed that product innovation involves improvement of existing products as shown by a mean score of 4.09. The level of agreement was also extended to other statements as follows: Quality improvement is one of the ways an organization should achieve product innovation as shown by a mean score of 4.34. Product innovation involves enhanced technical specification as shown by a mean score of 4.23. The respondents indicated that product innovation could be achieved in their respective companies through creation of customer friendly products and increasing product portfolio.

The findings concur with those by Ganter and Hecker (2013) who contemplated that organizational innovation is mainly seen through the eyes of product innovation which mainly describe the brand and existence of the organization. The findings are also in line with the arguments by Rogers (1995) on his diffusion innovation theory that innovation in a modern world is mainstreamed by techno-based enhancement of products as a way of meeting new needs and tastes from the customers. Rogers describes product innovation as a branch of innovation that strengthens the continued existence of a product in the market through coming up with new designs that are aligned to the changing market. This is also emphasized by Pantano and Viassone (2014) who also contend that product innovation stands for other forms of innovation that drives the organization to come up with new markets, processes and technologies to support the new or improved products.

Table 4.6: Influence of Product Innovation Strategies and Performance

Statement	SD	D	N	A	SA	Mean	Std. Dev
Development of new product is essential for growth	0%	0%	26.7%	40.0%	33.3%	4.07	.775
Product innovation involves development of new products	0%	0%	18.3%	39.2%	42.5%	4.24	.745
Product innovation involves improvement of existing products	0.8%	1.7%	19.2%	44.2%	34.2%	4.09	.820
Quality improvement can achieve product innovation	0%	0%	9.2%	47.5%	43.3%	4.34	.642
Product innovation involves enhanced technical specification	0%	2.5%	12.5%	44.2%	40.8%	4.23	.764
Product innovation can be achieved through creation of customer friendly products	0%	0%	9.2%	35.0%	55.8%	4.47	.660
Increasing product portfolio is an important innovation strategy	0%	1.7%	9.2%	30.0%	59.2%	4.47	.733

The respondents were further asked to indicate other ways they had integrated product innovation in their respective firms. The respondents commented that they had embraced product innovation through coming up with improvements of the existing products as a way of meeting the needs and expectations of the customers. Respondents' comments further affirmed that continued improved performance could be attributed to the company's commitment to promote product innovations by increasing untapped demand in new product attributes and delivery of services.

4.5.3 Influence of Market Innovation Strategies

The third objective of the study was to establish the influence of market innovation strategies on performance of Data Service Providers in Kenya. The respondents were asked to indicate whether market innovation strategies influenced performance through giving their opinions on given statements based on a 5-point Likert's scale. The study sought to understand the extent to which market innovation strategies influence firm performance. The findings as shown in figure 4.7, majority of the respondents (50.8%) indicated that market innovation strategies influenced firm performance to a moderate extent, 46.7% indicated that market innovation strategies influenced firm performance to a great extent while 2.5% of the respondents said that

market innovation strategies influenced firm performance to a small extent. The findings concur with those by Tavassoli and Karlsson (2015) who established that market innovation played a key role in enhancing the ability of the firm to steer its market strength and enhance performance.

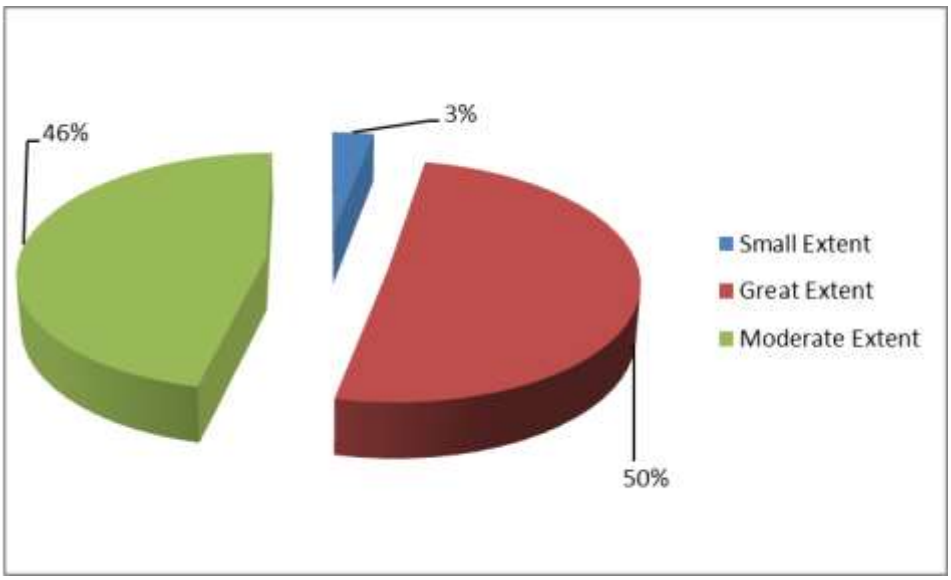

Figure 4.7: Influence of Market Innovation Strategies

The study also sought to determine the influence of market innovation strategies on performance of Data Service Providers. The response was rated on a scale of 1-5 on which: 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree and 5= strongly agree. Table 4.7 below shows the descriptive statistics describing the data in details. From the findings, majority of the respondents in the study agreed with the statement that listening to customers' opinion is key to effective market innovation strategies as shown by a mean score of 4.08. On the other hand, respondents agreed that new product pricing is important in the realization of effective market innovation strategies as shown by a mean score of 4.29. A majority of the respondents widely held the opinion that new product design is important in the realization of effective market innovation strategies as shown by a mean score of 4.25. The level of agreement was also extended to other statements as follows: The Company focuses on the market in which it has competitive strength as shown by a

mean score of 4.24. New product promotion techniques are important in realization of effective marketing strategies as shown by a mean score of 4.35. The respondents agreed that product replacement was an important aspect in the realization of effective marketing strategies and that application of changing market orientation contribute to better market penetration as a market innovation strategy.

The findings are in line with those by Saeed (2015) who found out that market innovation is a gear towards enhancing the ability of a firm to enlarge its existing market and gain more penetration strength through new designs and pricing as well as new ways of product promotion. According to De Clercq (2014), innovation is about capturing new attention which in this case means new customers through establishing the existing gaps and innovating towards feeling those gaps. Market innovation strategy therefore creates the ability of the modern organizations to come up with new ways of capturing new customers in their already existing market while at the same time entering new markets (Bogers et al., 2017. The findings are also in support of Schumpeter theory of innovation that argue that anyone seeking profits must innovate since innovation can cause the different employment of economic system's existing supplies of productive means. The findings revealed that most of the respondents consider listening to the customers and focusing on their needs as one way towards enhancing market innovation which is also stipulated in the open innovation theory that encapsulate the integration of customers into the innovation process permitting a firm to capture potential customers' latent requirements.

Table 4.7: Influence of Market Innovation Strategies and Performance

Statement	SD	D	N	A	SA	Mean	Std. Dev.
Listening to customers opinion is key to effective market innovation strategies	0%	0.8%	21.7%	45.8 %	31.7 %	4.08	.751
New product pricing is important to effective market innovation	0%	3.3%	13.3%	34.2 %	49.2 %	4.29	.824
New product design is important to realize effective market innovation strategy.	0%	0%	15.8%	43.3 %	40.8 %	4.25	.713
Company focuses on market which has competitive strength	0%	0.8%	15.0%	43.3 %	40.8 %	4.24	.733
New product promotion techniques are important in realization of effective marketing strategies	0%	0%	14.2%	36.7 %	49.2 %	4.35	.718
Product replacement is important to market strategy	1.7 %	2.5%	15.0%	34.2 %	46.7 %	4.22	.909
Application of changing market orientation	0%	1.7%	11.7%	30.0 %	56.7 %	4.42	.762

The respondents were further asked to expound on other ways that their respective companies explored market innovation strategies. The respondents indicated that their firms explored new markets as part of their market innovation while expanding their coverage of the existing markets through increasingly bringing new products and services that had a larger pool of the customers. From open-ended questions, findings revealed that market expansion was integrally achieved through co-designing new products and services through continuous investments in customer feedback that would feed into designing solutions that match customer expectations.

The findings concur with those by Branstad, and Solem (2020) who established that companies utilize their knowledge on what the customers need to not only develop products that suit such needs but also create more delivery avenues for the products. According to D'Attoma and Ieva (2020), through expanding markets orchestrated by

market innovations, modern organizations strengthen their competitive advantage and this enables them to have more sustainable revenues.

4.5.4 Influence of Technological Innovation Strategies

The study sought to investigate how technological innovation strategies influenced performance of Data Service Providers in Kenya as the fourth objective. The respondents were asked to indicate whether technological innovation strategies influenced performance of Data Service Providers based on a Likert's scale. The study sought to understand to what extent technological innovation strategies influence firm performance. The findings as shown in figure 4.8 revealed that majority of the respondents (59.2%) indicated that technological innovation strategies influence firm performance to a great extent, 39.2% said that technological innovation strategies influence firm performance to a moderate extent while 1.7% of the respondents said that technological innovation strategies influence firm performance to a small extent. According to Yunis, El-Kassar and Tarhini (2017) technological innovation is a key element of innovation that drives the entire innovation process in influencing firm performance. Through new technologies, the organizations develop a motive and framework of enhancing other forms of innovations such as market, product and process.

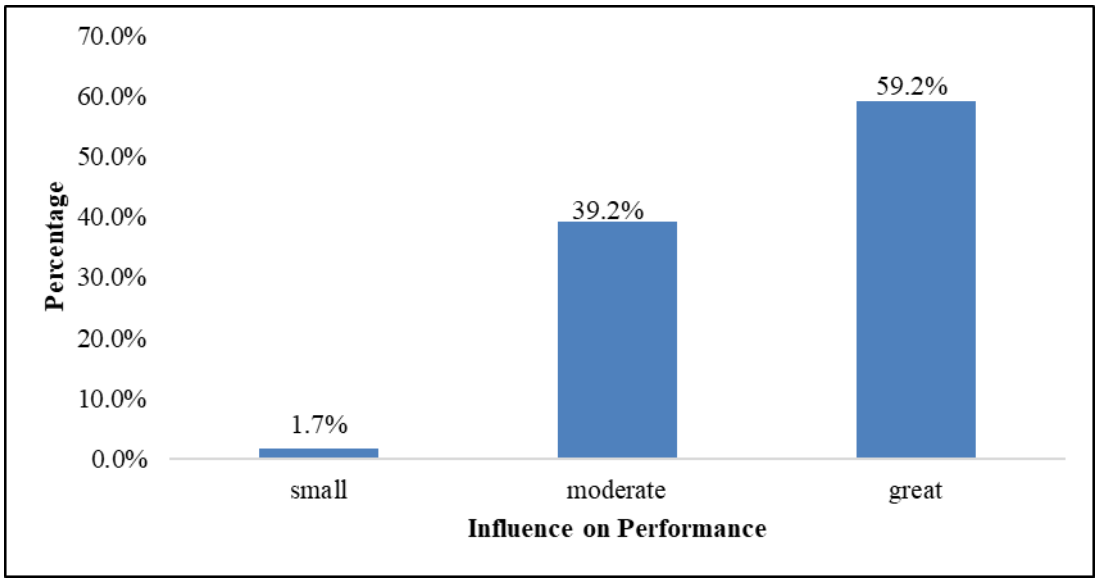

Figure 4.8: Influence of Technological Innovation Strategies

The study further sought to determine the influence of technological innovation strategies on performance of Data Service Providers. The response was rated on a scale of 1-5 on which: 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree and 5= strongly agree. Table 4.8 below shows the descriptive statistics describing the data in details. From the findings, majority of the respondents in the study agreed with the statement that technological innovation strategy involves adoption of new technology as shown by a mean score of 4.02. Further, respondents in the study agreed that process innovation is key in achieving technology innovation as shown by a mean score of 4.33. A majority of the respondents agreed that technological innovation strategy involves adoption of new systems such as ERP by the firm as shown by a mean score of 4.35. The level of agreement was also extended to other statements as follows: Technological innovation strategy is achieved by increasing investments in innovation technology as shown by a mean score of 4.37. Technological innovation strategy is realized through automation of routine tasks produced a higher value as shown by a mean score of 4.23. The respondents stated that technological innovation strategy promoted inter-organization processes and collaboration.

The findings imply that technological innovation influences firm performance through enhanced automation, new systems and new technologies. According to the findings by Tajuddin, Iberahim and Ismail (2015), technological innovation stands at the helm of innovation strategy in that it streamlines the plan and execution of innovations through opening other new sources of information, communication and highways of turning plans into actions. The findings gain support from the Christensen (1997) theory of disruptive innovation who allude that innovation is a process of changing the way of doing things by coming up with techno-assisted frameworks to close the existing gaps and tap the untapped spots thus steering performance. Tajuddin (2015) describe technological innovation as a pathway towards achieving strategic goals of an organization through which the viability and effectiveness of other forms of technology are framed towards an achievable line.

Table 4.8: Influence of Technological Innovation Strategies and Performance

Statement	SD	D	N	A	SA	Mean	Std. Dev.
Technological innovation strategy involves adoption of new technology	0%	0%	26.7%	45.0%	28.3%	4.02	.745
Process innovation is key in achieving technology innovation	0%	0%	17.5%	31.7%	50.8%	4.33	.760
Adoption of new system such as ERP	0%	0%	10.8%	43.3%	45.8%	4.35	.669
Technological innovation strategy is achieved by increasing investments in innovation technology	0%	0%	10.8%	41.7%	47.5%	4.37	.673
Technological innovation strategy is realized through automation of routine tasks	0%	0%	17.5%	35.0%	45.0%	4.23	.825
Technological innovation strategy promotes inter-organization processes and collaboration	0%	1.7%	10.0%	40.0%	48.3%	4.35	.729
Technological innovation strategies promote intra-organization processes and collaboration	0%	1.7%	4.2%	34.2%	60.0%	4.53	.661

The respondents were further asked to indicate other was that their respective companies achieved technological innovation. From the findings, it was revealed that most of the respondents opined that technological innovation was achieved by ensuring new technologies were put on board in their operations and that they streamlined the ability of the Data Service Providers to offer unique products and compete with the rest of the industry. Respondents noted that embracing technological innovations by embracing gaps in technology from competition has catapulted their firms to offer services that are noted and sought after by consumers.

The findings compare with those by Pacheco (2016) who established that technological innovation is instrumental in enabling smaller companies to catch-up with their large counterparts in order to enhance their competitive advantage and performance. According to Aljanabi (2018), companies need to be concerned with the adequacy of their business innovation strategies in relation to the new technologies. This is because recognizing the possibilities or threats of new technologies introduced in the market for the business model allows the company to react by realigning its products or services and processes.

4.5.5 Moderating Effect of Entrepreneurial Orientation

The study sought to investigate how entrepreneurial orientation moderates the relationship between innovation strategies and performance of Data Service Providers. The study sought to understand the extent to which entrepreneurial orientation had been embraced in the DSPs. The respondents were asked to indicate the extent to which they had embraced entrepreneurial orientation in their respective firms. The findings as presented in figure 4.9 show that majority of the respondents (60.8%) agreed that entrepreneurial orientation was embraced in their respective firms to a moderate extent, 31.7% said that entrepreneurial orientation was embraced to a great extent while 7.5% of the respondents said entrepreneurial orientation was embraced to a small extent. As indicated by Covin *et al.* (2020), entrepreneurial orientation creates a pathway for organizations through the management and the employees to be creative, innovative and proactive in order to take advantage of new innovations and open-minded for more opportunities.

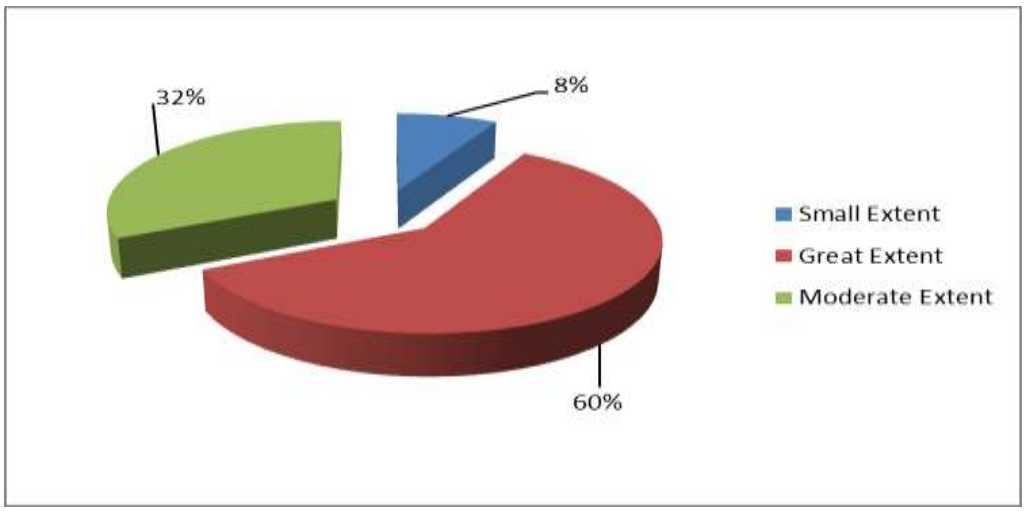

Figure 4.9: Extent of Embrace of Entrepreneurial Orientation

The study sought to determine the respondents' level of agreement or disagreement with key statements on entrepreneurial orientation. This was based on a 5-point's Likert's scale of 1-5 on which: 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree and 5= strongly agree. Table 4.9 below shows the descriptive statistics describing the data in details. From the findings, majority of the respondents in the study agreed with the following statements: Through entrepreneurial orientation, the firm is able to introduce new products/services ahead of the competitors as shown by a mean score of 3.95. Through entrepreneurial orientation, the firm is able to anticipate for future demand as shown by a mean score of 4.12. Through entrepreneurial orientation, the firm is able to influence market environment as shown by a mean score of 4.12. Further, majority of the respondents in the study agreed with the following statements: Entrepreneurial orientation facilitates the firm to penetrate into new ventures as shown by a mean score of 4.11. Entrepreneurial orientation enables the firm to source for external finances produced s shown by a mean score of 4.10. The respondents agreed that through entrepreneurial orientation their respective firms were able to adopt new technologies as well as introduce new processes.

The findings imply that continued entrepreneurial activities support innovation strategies such as market innovation, technological, process and product innovations with the totality of such strategies supporting overall firm performance. The findings

concur with those by Ibidunni (2018) who found that through entrepreneurial orientation, modern business enhance their ability to come up with new ways of doing things thus gaining competitiveness and performance. Laukkanen (2013) found out that among the aspects of entrepreneurial orientation, innovativeness was more critical to firm performance. The scholars highlighted that entrepreneurial orientation was a basis of innovation through which creativity is stimulated. Buli (2017) also established that entrepreneurial orientation has both a direct and moderating effect on firm performance in relation to innovation strategies.

Table 4.9: Descriptive Statistics on Entrepreneurial Orientation

Statement	SD	D	N	A	SA	Mean	Std. Dev.
Introduce new product or service through orientation	1.7%	2.5%	19.2%	52.5%	24.2%	3.95	.829
Anticipate the future through orientation	0%	1.7%	20.8%	40.0%	37.5%	4.12	.852
Influence the market environment	1.7%	1.7%	17.5%	41.7%	37.5%	4.12	.871
Penetration into new ventures	0%	1.7%	20.0%	42.5%	35.8%	4.11	.838
Source for external finances	3.3%	1.7%	13.3%	45.0%	36.7%	4.10	.929
Adopt new technologies	1.7%	0.0%	16.7%	33.3%	48.3%	4.27	.857
Introduce new processes	1.7%	3.3%	10.0%	30.8%	54.2%	4.33	.909

4.5.6 Performance of Data Service Providers

The researcher sought to assess the performance of the Data Service Providers. The respondents were asked to indicate the effectiveness of the process innovation, product innovation, market innovation and technological innovation strategies in influencing performance of the Data Service Providers. From the findings as shown in table 4.10, 45.8% of the respondents indicated that process innovation strategies were most effective in influencing performance, 42.5% of the respondents said that product innovation strategies were most effective in influencing performance, 35.8% of the respondents said that market innovation strategies were most effective in influencing performance and 46.7% of the respondents said that technological innovation strategies were most effective in influencing performance.

Table 4.10: Effectiveness of Innovation Strategies

Aspect	Most effective	Effective	Neutral	Least effective
Process innovation	45.8%	27.5%	11.7%	15.0%
Product innovation	42.5%	20.8%	17.5%	19.2%
Market innovation	35.8%	18.3%	15.8%	30.0%
Technological innovation	46.7%	12.5%	14.2%	26.7%

The study sought to evaluate the performance of Data Service Providers. The response was rated on a scale of 1-5 on which: 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree and 5= strongly agree. Table 4.11 below shows the descriptive statistics describing the data in details. From the findings, majority of the respondents in the study agreed with the statement that product innovation strategies result in improved profitability of the organizations as shown by a mean score of 4.07, while process innovation strategies result to improved profitability of the organizations as shown by a mean score of 4.23. A majority of the respondents agreed and widely held the opinion that increase in the firm sales volume has been caused by improvement in innovation strategies as shown by a mean score of 4.09. The level of agreement was also extended to other statements, as follows: there is an overall improvement in service delivery over time due to adoption of innovation strategies such as use of modern technology as shown by a mean score of 4.23. The respondents stated that through adoption of innovation strategies their respective firms were able to achieve their customer satisfaction goal as well as enhance the efficiency in service delivery. The findings affirm the critical role of innovation strategies in enhancing the performance of data service providers.

The findings are in line with those by Qamruzzaman and Jianguo (2018) who found out that innovation through introduction of new products, processes and markets creates a framework for organizations to derive their full potential and take advantage of the always-changing business world to enhance their competitiveness and performance. Bakar and Ahmad (2010) contemplate that innovation is one of the measures of desire to performance by modern business in that it is the avenue

through which businesses gain more diverse ways to enhance competitiveness and meet customer needs.

Table 4.11: Performance of Data Service Providers

Statements	SD	D	N	A	SA	Mean	Std. Dev.
Product innovation Improve profitability	0%	2.5%	16.7%	52.5%	28.3%	4.07	.742
Process innovation Improve profitability	0%	0%	20.8%	35.0%	44.2%	4.23	.775
Improvement in innovation increase sales	0.8%	3.3%	11.7%	54.2%	30.0%	4.09	.789
Modern technology service delivery	0%	0%	20.8%	35.8%	43.3%	4.23	.772
Customer satisfaction goal adoption of innovation	0%	1.7%	10.8%	42.5%	45.0%	4.31	.731
Efficiency in service delivery	0%	2.5%	5.0%	27.5%	65.0%	4.55	.708

4.6 Diagnostic Tests

The study performed tests on statistical assumptions of regression and statistics used. These included tests of normality, linearity, independence, and homogeneity and multi-co linearity. When the assumptions of the linear regression model are correct, ordinary least squares (OLS) provide efficient and unbiased estimates of the parameters (Kaiser, 1974).

4.6.1 Normality Test

Normality tests were done to determine whether sample data was drawn from a normally distributed population. Normality assessment was done by use of a graphical or numerical procedure. The numerical procedures included inferential statistics such as Kolmogorov-Smirnov and Shapiro-Wilk. The Kolmogorov-Smirnov test is considered appropriate for samples larger than 2000 while Shapiro-Wilk test is deemed appropriate for samples ranging from 50 to 2000. In this study, the usable response rate was 120 and hence Shapiro-Wilk test was used. Normality was tested using Shapiro-Wilk test, which has power to detect departure from

normality due to either skewness or kurtosis or both. If statistic ranges from zero to one and figures higher than 0.05, this indicates the data is normal (Razali & Wah, 2011). Shapiro-Wilk test assesses whether data is normally distributed against hypothesis in that:

H_0: Sample follows a Normal distribution.

H_a: Sample does not follow a Normal distribution.

Table 4.12: Shapiro-Wilk

	Statistic	**Df**	**Sig.**
Process Innovation Strategies	.833	120	.058
Product Innovation Strategies	.754	120	.071
Market Innovation Strategies	.947	120	.069
Technological Innovation Strategies	.963	120	.103
Entrepreneurial Orientation	.935	120	.112
Performance	.927	120	.091

When the p-value is greater than the alpha value, then we fail to reject the null hypothesis. Table 4.11 shows the results of the Shapiro-Wilk normality test. From the table 4.17, we could not reject the null hypothesis as Process Innovation Strategies (p = .833), Product Innovation Strategies (p = .754), Market Innovation Strategies (p = .947), Technological Innovation Strategies (p = .963), Entrepreneurial Orientation (.935) and performance (0.927). This leads to p-values higher than 0.05 hence we conclude that the variables are normally distributed.

4.6.2 Auto Correlation Test

Durbin-Watson (DW) statistic was used to test for autocorrelation in line with Field (2009). Based on the recommendation by Field (2009), null hypothesis is where there is no autocorrelation which can only be accepted when DW test shows a value between the range of 1.5 to 2.5. Findings in this study showed DW coefficient ranging from 1.574 to 1.795 which indicate that autocorrelation was not a problem as shown in Table 4.12.

Table 4.13: Auto Correlation

Independent Variable	DW Coefficient
Process Innovation Strategies	1.683
Product Innovation Strategies	1.574
Market Innovation Strategies	1.597
Technological Innovation Strategies	1.693
Entrepreneurial Orientation	1.795

4.6.3 Test for Heteroscedasticity

Test for heteroscedasticity was done using Breush-pagan/Cook-Weisberg Test. The null hypothesis in the test is when error terms have a constant variance (i.e. should be homoscedastic). The error terms are said to be Homoscedastic, if the p value is greater than the conventional p value 0.05, otherwise the errors terms are said to be heteroskedastic. In regression analysis for instance, heteroscedasticity can void statistical tests of significance that assume that data set errors are normally distributed and uncorrelated and whose variance do not vary after being modelled. Hamsici and Martinez (2007) reiterated the fact that any residual table and correlation results generated through SPSS that are to be used for testing for collinearity can also be used to check the existence or absence of heteroscedasticity. In this study, the assumption of heteroscedasticity was apparent that there was no violation. The findings as shown in Table 4.13 have small chi-square value and insignificant p-value meaning that heteroscedasticity did not pose a problem.

Table 4.14: Heteroscedasticity Test

Variable	Chi Square	P value
Process Innovation Strategies	1.23	0.762
Product Innovation Strategies	0.67	0.567
Market Innovation Strategies	2.34	0.089
Technological Innovation Strategies	1.56	0.093
Entrepreneurial Orientation	0.53	0.123
Over all model	0.98	0.224

4.6.4 Multi-Collinearity Test

According to William (2013), multi-collinearity refers to the presence of correlations between the predictor variables. In severe cases of perfect correlations between predictor variables, multi-collinearity can imply that a unique least squares solution to a regression analysis cannot be computed, (Field, 2009). Multi-collinearity inflates the standard errors and confidence intervals leading to unstable estimates of the coefficients for individual predictors (Belsley, 2008). Collinearity tests were used to conduct the multi-collinearity test. The rule of the thumb is that if the VIF value lies between 1-10 then there is no multi-collinearity and if the VIF value is <1 or > 10, there is multi-collinearity.

Preliminary results in table 4.14 indicate that there was no multi-collinearity between the independent variables and the dependent variable as the VIF values lies between 1 and 10. This was supported by the fact that the Pearson correlation coefficient for all the variables was less than 0.8. The Pearson correlation coefficient for process innovation strategies, product innovation strategies, market innovation strategies, technological innovation strategies and entrepreneurial orientation was 0.752, 0.703, 0.652, 0.784 and 0.707 respectively all the values were less than 0.8 as shown in table 4.14.

Table 4.15: Multi-Collinearity Test

	Tolerance	**VIF**
Process Innovation Strategies	.752	1.330
Product Innovation Strategies	.703	1.422
Market Innovation Strategies	.652	1.533
Technological Innovation Strategies	.784	1.275
Entrepreneurial Orientation	.707	1.413

4.6.5 Linearity Test

When performing multiple regressions, we assume that the relationship between the response variable and the predictors is linear. If this assumption is violated, the multiple regressions will try to fit a straight line to data that do not follow a straight line. To assess linearity, the primary concern is to observe the scatterplot of the standardized residuals with the standardized predicted values. From the Figure 4.10 and Figure 4.11 it appears that the relationship of standardized predicted to residuals is roughly linear around zero. We can conclude that the relationship between the response variable and predictors is zero since the residuals seem to be randomly scattered around zero. From the graph the residual trend is centered around zero while the variance around zero is scattered uniformly and randomly. We conclude that the linearity assumption is satisfied if we run the fully specified predictive model.

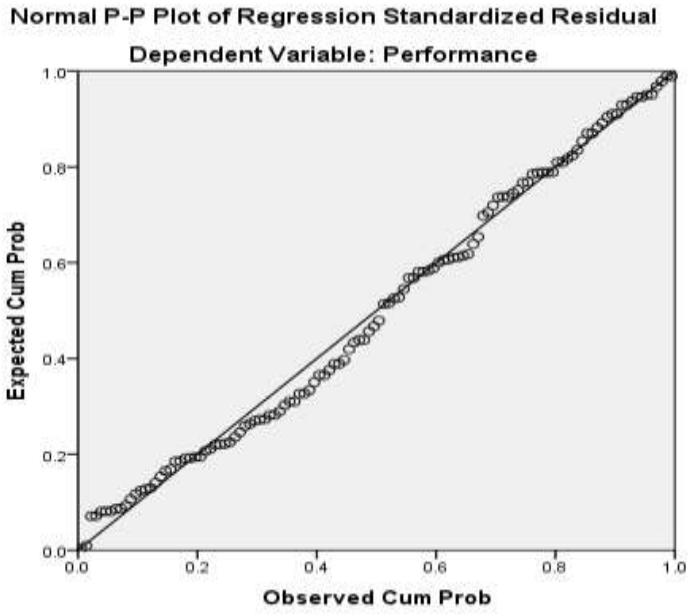

Figure 4.10: Linearity Scatterplot

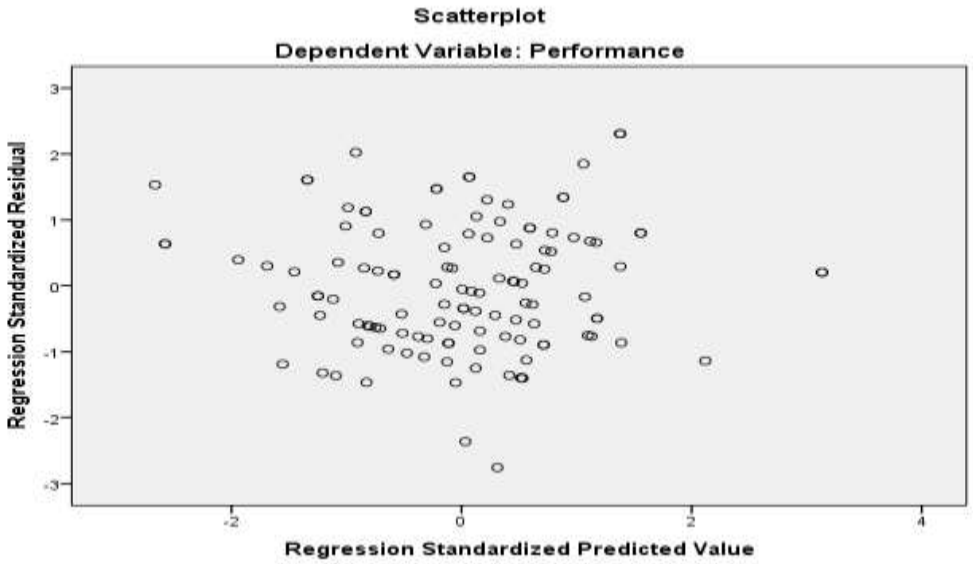

Figure 4.11: Residual Scatterplot

4.7 Correlation Analysis

Siedlecki (2020) states that Pearson's correlation is used when one is working with two quantitative variables in a population to establish the magnitude and direction of the relationship. The possible research hypotheses are that the variables will show a positive linear relationship, a negative linear relationship, or no linear relationship at all (Amrhein, Trafimow & Greenland, 2019). These authors argue that Pearson's correlation coefficients indicate the extent of interdependence between two variables. The Pearson correlation coefficient, ***r***, can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association; that is, as the value of one variable increases, so does the value of the other variable (Siedlecki, 2020). A value less than 0 indicates a negative association; that is, as the value of one variable increases, the value of the other variable decreases. In this study the Pearson correlation coefficient, ***r***, was used to show the degree and significance of the relationship between variables.

4.7.1 Correlation between Process Innovation Strategies and Performance

This study sought to establish whether there was any form of correlation between process innovation strategies and performance of Data Service Providers in Kenya. The findings are summarized in Table 4.15. From the table, a positive correlation coefficient of 0.718 (or 71.80%) exist between process innovation strategies and performance of Data Service Providers

.Table 4.16:Correlation between Process Innovation Strategies and Performance

		Process innovation strategies	**Performance**
Process innovation strategies	Pearson Correlation	1	.613
	Sig. (2-tailed)		.000
	N	120	120
Performance	Pearson Correlation	.718	1
	Sig. (2-tailed)	.000	
	N	120	120

With the existence of a positive correlation between process innovation strategies and performance of Data Service Providers, the study findings support literature reviewed in a study by Muharam, Andria & Tosida (2020) that highlighted the highlighted that there is a positive relationship between process innovation, market innovation and financial performance of firms.

4.7.2 Correlation between Product Innovation Strategies and Performance

This study sought to establish whether there was any form of correlation between product innovation strategies and performance of Data Service Providers in Kenya. The findings are summarized in Table 4.16. From the findings, a positive correlation coefficient of .801 (or 80.10%) exist between product innovation strategies and performance of Data Service Providers. The existence of a positive correlation coefficient between product innovation strategies and performance affirms that product innovation strategies contribute significant value to performance of Data Service Providers.

Table 4.17: Correlation between Product Innovation Strategies and Performance

		Product Innovation Strategies	Performance
Product Innovation Strategies	Pearson Correlation	1	0.704
	Sig. (2-tailed)		.005
	N	120	120
Performance	Pearson Correlation	0.801	1
	Sig. (2-tailed)	.005	
	N	120	120

4.7.3 Correlation between Market Innovation Strategies and Performance

This study sought to establish whether there was any form of correlation between market innovation strategies and performance of Data Service Providers in Kenya. The findings are summarized in Table 4.17. From the table, a positive correlation coefficient of .670 (or 67.0%) existed between market innovation strategies and performance of Data Service Providers. The existence of positive correlation highlights the importance of market innovation strategies contribution in influencing performance of Data Service Providers. This is in line with study findings by Hong (2015), who observe that innovative marketing strategies improve brand relationship and experiences with customers by exerting their influence on brand marketing efforts and allowing brands to be customer centric which is critical in developing a profitable business.

Table 4.18: Correlation between Market Innovation Strategies and Performance

		Market Innovation Strategies	Performance
Market Innovation Strategies	Pearson Correlation	1	0.521
	Sig. (2-tailed)		.000
	N	120	120
Performance	Pearson Correlation	0.670	1
	Sig. (2-tailed)	.000	
	N	120	120

4.7.4 Correlation between Technological Innovation Strategies and Performance

This study sought to establish whether there was any form of correlation between technological innovation strategies and performance of Data Service Providers in Kenya. The findings are summarized in Table 4.18. From the table, a positive correlation coefficient of .716 (or 71.60%) existed between technological innovation strategies and performance of Data Service Providers. The existence of a positive correlation expounds the role of technology as a key driver in influencing performance of Data Service Providers.

Table 4.19: Correlation between Technological Innovation Strategies and Performance

		Technological Innovation Strategies	Performance
Technological Innovation Strategies	Pearson Correlation	1	0.716
	Sig. (2-tailed)		.000
	N	120	120
Performance	Pearson Correlation	0.716	1
	Sig. (2-tailed)	.000	
	N	120	120

4.7.5 Correlation between Entrepreneurial Orientation and Performance

This study sought to establish whether there was any form of correlation between entrepreneurial orientation and performance of Data Service Providers in Kenya. The findings are summarized in Table 4.19. From the table, a positive correlation coefficient of .708 (or 70.80%) existed between entrepreneurial orientation and performance of Data Service Providers. This confirms that not only are entrepreneurship and innovation complementary, but a combination of the two is vital to organizational success. These findings agree with those of Martens et al. (2018) who affirmed existence of a positive correlation between the entrepreneurial orientation and the project success and reiterated that a firm's entrepreneurial processes might help the chase of new entries opportunities that enhance its performance, the adoption of a strong entrepreneurial orientation (EO) is considered necessary but insufficient for wealth creation by new ventures.

Table 4.20: Correlation between Entrepreneurial Orientation and Performance

		Entrepreneurial Orientation	Performance
Entrepreneurial Orientation	Pearson Correlation	1	.618
	Sig. (2-tailed)		.000
	N	120	120
Performance	Pearson Correlation	.708	1
	Sig. (2-tailed)	.000	
	N	120	120

4.8 Regression Analysis and Hypothesis Testing

At the inferential stage of analysis, the researcher sought to explore the nature of relationship between innovation strategies and performance of Data Service Providers in Kenya. Statistical techniques were adopted to determine the relationship between the independent variables and the dependent variable and further determined the levels of influence that process innovation strategies, product innovation strategies, market innovation strategies, technological innovation strategies and entrepreneurial orientation have effect on the performance Data Service Providers in

Kenya. The analysis adopted for inferential analysis involved parametric estimations that require the variables used to be measured on a continuous scale. The indicators were measured on an ordinal categorical scale and the descriptive analysis used non-parametric techniques to measure central tendency. The latent variables that are for the study variable that resulted from the computation of total scores from factor analysis were resulting continuous measures of the constructs and therefore were used for parametric estimation.

4.8.1 Process Innovation Strategies and Performance

H_{o1}: There is no significant relationship between process innovation strategies and performance of Data Service providers in Kenya.

The results presented in table 4.20 present the fitness of model used by the regression model in explaining the study phenomena. Process innovation strategies explain 70.8% of the performance of data service providers in Kenya.

Table 4.20 provides the results on the analysis of the variance (ANOVA). The results indicate that the model was statistically significant as supported by a p value of 0.001 which is less than the critical P-value of 0.05. This implying that process innovation strategies is a good predictor of the performance of Data Service Providers.

Table 4.21: Regression Model Results on Process Innovation Strategies and Performance of Data Service Providers

Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.841	.708	.705	.32245

Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	29.701	1	29.701	285.655	.000[b]
	Residual	12.269	118	.104		
	Total	41.970	119			

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.181	.113		1.604	.111
	Process innovation strategies	.873	.052	.841	16.901	.001

a Dependent Variable: Performance of Data Service Providers

The outcome resonates with Piening and Salge (2015), who found that process innovation is an aspect crucial to the success of any business. It is an integrated concept that involves changes in the production process which is aimed at reducing the costs, wastes and lead time or at improving production efficiency. The results further agree with Branscomb and Aueswald (2006) who opined that a successful process innovation itself contains new production model tactics or business models to create new or improved products or services for the market to use, adopting and implementing process innovation may help firms to understand on how to organize and control innovation.

The study further assessed the structural relationship between the parameters of process innovation and performance of data service providers. This was done using AMOS and the pathway diagram is as shown in Figure 4.12. As the findings portray, all the three parameters of process innovation had positive contribution to the overall variance of the variable. Improvement of the existing programmes had however the highest impact with a coefficient of 0.417. Process innovation had a significant

influence on performance of the data service providers as shown by a coefficient of 0.819. This is an implication that the performance of data service providers is influenced by process innovation through new programmes and processes in service offerings. Anning-Dorson (2016) reiterate that process innovation point to pursuing new activities, routines and processes in service to enhance the delivery of significant benefits to customer, and the release of capabilities within the service firm. The process innovation as a process could result in the creation of new delivery systems (i.e. means), facilitators for service delivery (catalysts) and/or a service product.

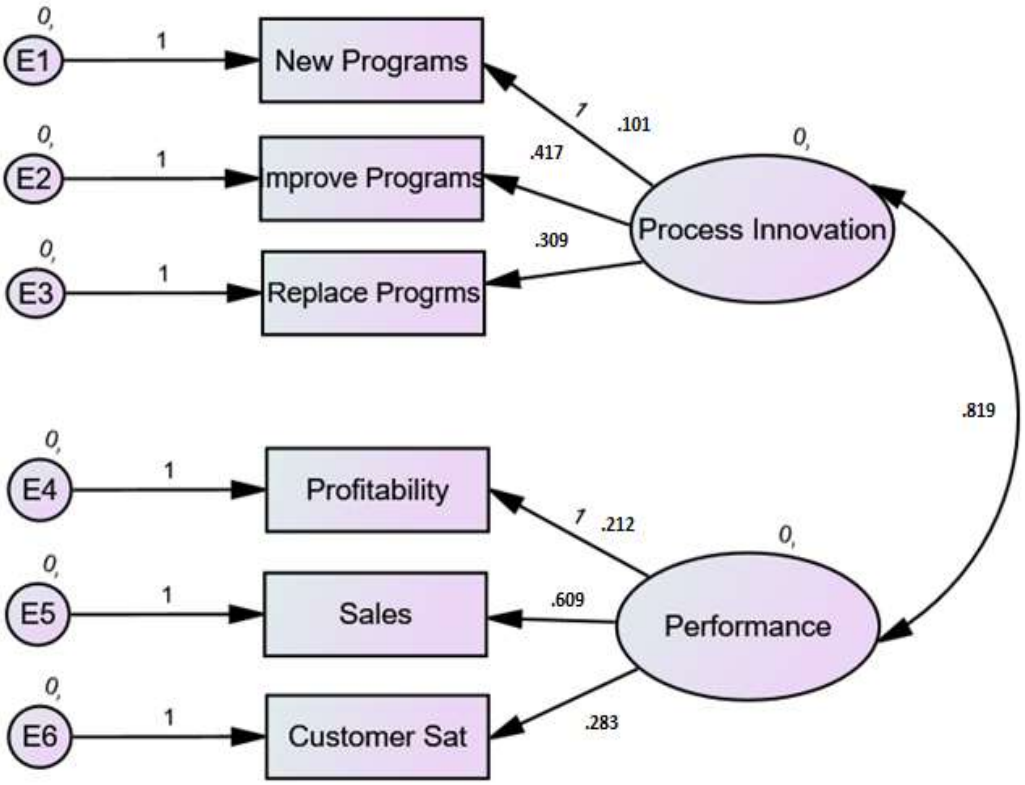

Figure 4.12: Pathway Diagram for Process Innovation Strategies

4.8.2 Product Innovation Strategies and Performance

H_{o2}: There is no significant relationship between product innovation strategies and performance of Data Service providers in Kenya.

The results presented in table 4.21 present the fitness of model used by the regression model in explaining the study phenomena. Product innovation strategies explained 62.7% of the performance of Data Service Providers in Kenya.

Table 4.21 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant as supported by a p value of 0.000 which is less than the critical p value of 0.05. The model demonstrate that product innovation strategies are a good predictor of the performance of Data Service Providers.

Regression of coefficients results in table 4.21 shows that there is a positive significant relationship between product innovation strategies and the performance of Data Service Providers as shown by a p value of 0.001 which is less than the critical p value of 0.05. This was supported by the t values whereby t cal=14.070 > t critical =1.96 at a 95 percent confidence level which depicts that we reject the null hypothesis and accept the alternative hypothesis. The model demonstrates that product innovation strategies influence the performance of Data Service Providers.

Table 4.22: Regression Model Results on Product Innovation Strategies and Performance of Data Service Providers

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.627	.623	.36446

Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.296	1	26.296	197.964	.000[b]
	Residual	15.674	118	.133		
	Total	41.970	119			

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.150	.137		1.092	.277
	Product Innovation Strategies	.907	.064	.792	14.070	.001

a. Dependent Variable: Performance of Data Service Providers

These findings augment findings by Kuncoro and Suriani (2018) who carried out a study on achieving sustainable competitive advantage through product innovation and market driving. The study found that product innovation, market driving significantly affects sustainable competitive advantage. The findings agree with the study of Anning-Dorson (2016) on interactivity innovations, competitive intensity, customer demand and performance. The study found that high levels of interactivity innovations, in combination, drive superior performance. The findings reinforce support from several empirical reviews for example (Tavassoli &Bengtsson, 2018, Tavassoli & Karlsson, 2015, Mabrouk & Mamoghli, 2010, Ibekwe, 2021) where significant improvement of business performance was found to be positively associated with superior product innovation performance.

The study further carried out a structured equation model to establish the pathway relationship between the parameters of product innovation and performance of data service providers. The findings are as shown in Figure 4.13. As the findings portray, the three parameters of product innovation positively contributed to the overall influence of product innovation. Product innovation had a coefficient of 0.914 with performance of the data service providers, an indication that product innovation strategies positively contribute to the performance of the data service providers. A similar analysis by Boso, Story and Cadogan (2013) revealed that product innovation was a major aspect of innovation and mainly steered by improvement of the existing products and coming up with new products.

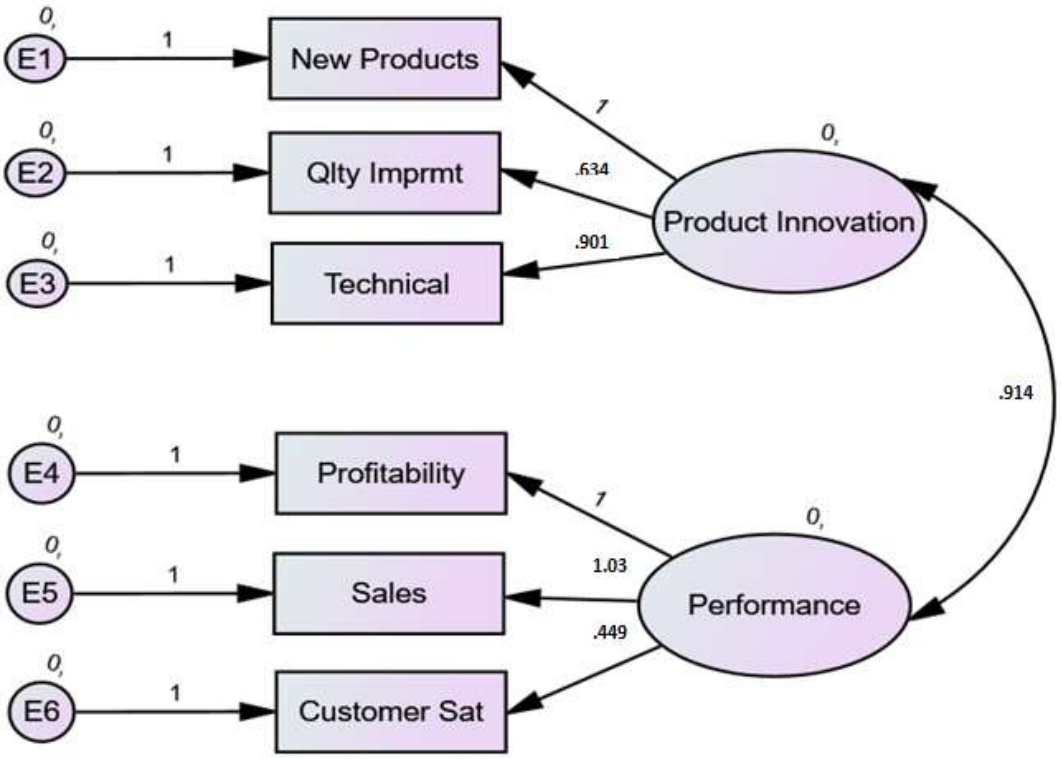

Figure 4.13: Structural Diagram on Product Innovation Strategies

4.8.3 Market Innovation Strategies and Performance

Ho_3: There is no significant relationship between market innovation strategies and performance of Data Service providers in Kenya.

The results presented in table 4.22 present the fitness of model used of the regression model in explaining the study phenomena. Market innovation strategies explained 69.4% of the performance of Data Service Providers in Kenya.

Table 4.22 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant as supported by a p value of 0.001, which is less than the critical p value of 0.05. This implying that market innovation strategies is a good predictor of the performance of Data Service Providers.

Regression of coefficients results in table 4.22 shows that there is a positive significant relationship between market innovation strategies and the performance of

Data Service Providers. The results indicate that the overall model was statistically significant as supported by a p value of 0.000, which is less than the critical p value of 0.05. This therefore imply that product innovation strategies are a good predictor of the performance of Data Service Providers as shown by a P-value of 0.001 which is less than the critical p value of 0.05. This was supported by the t values whereby t cal=16.370 > t critical =1.96 at a 95 percent confidence level which depicts that we reject the null hypothesis and accept the alternative hypothesis. This implies that market innovation strategies influence performance of Data Service Providers.

Table 4.23: Regression Model Results on Market Innovation Strategies and Performance of Data Service Providers

Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.833[a]	.694	.692	.32976

Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.139	1	29.139	267.968	.000[b]
	Residual	12.831	118	.109		
	Total	41.970	119			

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.434	.102		4.259	.000
	Market Innovation Strategies	.837	.051	.833	16.370	.000

a. Dependent Variable: Performance of Data Service Providers

The findings are in congruence with the study by Simiyu (2013) on market innovations adoption by commercial banks in Kenya. The study findings revealed that commercial banks had adopted several market innovation strategies including creating and nurturing strong brands, aggressive anti-competitors marketing, creating value through pricing, environmental analysis and response to changes, customer satisfaction and retention. Additionally, the findings agree with study by Ndubisi and Nataraajan (2016) on marketing relationships in the new millennium B2B sector. In

highlighting the findings, the study echoed the role of marketing relationships as an appropriate response to the challenges of the new millennium business environment. The findings find support in (Anning-Dorson, Hinson & Amidu, 2018, Feshchuk, 2017) who found existence of customer loyalty through innovations in marketing relationships whose end result was improved business performance.

A Structural Equation Model (SEM) was used to further establish the relationship between market innovation parameters and performance of data service providers in Kenya. The findings as shown in Figure 4.14 revealed that the three parameters of market innovation; product design, product pricing and product promotion had a positive impact on overall contribution of market innovation with product promotion with the strongest impact with a coefficient of 0.622. This is to imply that product promotion contributes up to 62.2% of the effect of market innovation on firm performance. The findings further show that market innovation had a positive impact on the performance of data service providers as shown by a coefficient of 0.738. The Findings compare with those by Felin and Zenger (2014) who established that market innovation was a major aspect of innovation that enhanced firm performance while identifying promotion of key products and services as a major boast towards market innovation.

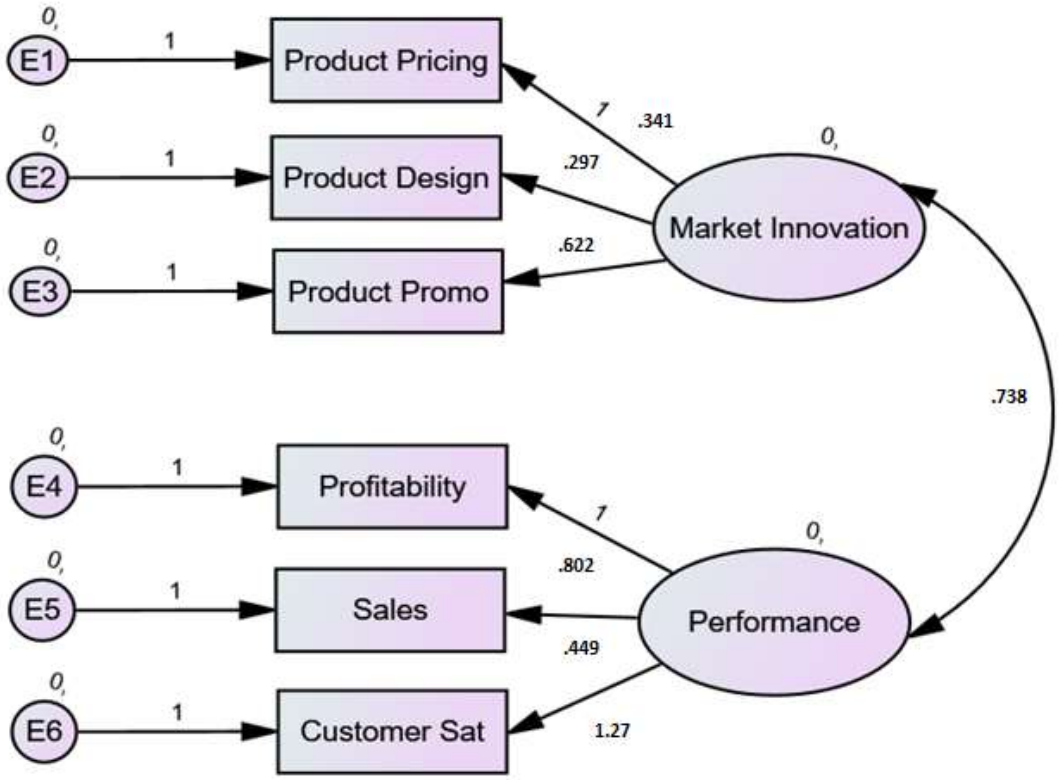

Figure 4.14: Structural Model Diagram on Market Innovation

4.8.4 Technological Innovation Strategies and Performance

H_{o4}: There is no significant relationship between technological innovation strategies and performance of Data Service providers in Kenya.

The results presented in table 4.23 present the fitness of model used of the regression model in explaining the study phenomena. Technological innovation strategies explained 69.6% of the performance of Data Service Providers in Kenya.

Table 4.23 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant as supported by a p value of 0.000 which is less than the critical p value of 0.05. This implying that technological innovation strategies is a good predictor of the performance of Data Service Providers.

Regression of coefficients results in table 4.23 shows that there is a positive significant relationship between technological innovation strategies and the performance of Data Service Providers as shown by a p value of 0.001 which is less than the critical p value of 0.05. This was supported by the t values whereby t cal=16.422 > t critical =1.96 at a 95 percent confidence level which depicts that we reject the null hypothesis and accept the alternative hypothesis. This implies that technological innovation strategies influence performance of Data Service Providers.

Table 4.24: Regression Model Results on Technological Innovation Strategies and Performance of Data Service Providers

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834[a]	.696	.693	.32903

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.195	1	29.195	269.682	.000[b]
	Residual	12.775	118	.108		
	Total	41.970	119			

Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.165	.117		1.404	.163
Technological Innovation Strategies	.891	.054	.834	16.422	.001

a. Dependent Variable: Performance of Data Service Providers

The model outcome embraces Tajuddin, Iberahim and Ismail (2015) who explored the relationship between technological innovation and organizational performance in the construction industry in Malaysia. The results revealed that technological innovation is significantly positive in influencing organizational performance. Additionally, the findings connect with Haabazoka (2019) who did a study of the effects of technological innovations on the performance of commercial banks in

developing countries-A case of the Zambian banking industry. The study looked at innovations in the area of Internet Banking, Mobile Banking and Automated Teller Machines (ATMs). The study in general revealed that bank technological innovations had a positive effect on the financial performance of commercial banks in Zambia.

An analysis of the Structural Equation Model was carried out to further establish the relationship between the parameters of technological innovation and performance of Data Service Providers in Kenya. The findings as shown in Figure 4.15 revealed that all the three parameters of technological innovation had a positive contribution on the overall impact of technological innovation. Automation of process had a coefficient of 0.645 thus being the parameter with the strongest impact on the technological innovation. Overall, technological innovation had a positive and strong influence on performance of Data Service Providers in Kenya. This agrees with Ganter and Hecker (2013) that technological innovation is a dimension of innovation that can support further innovations.

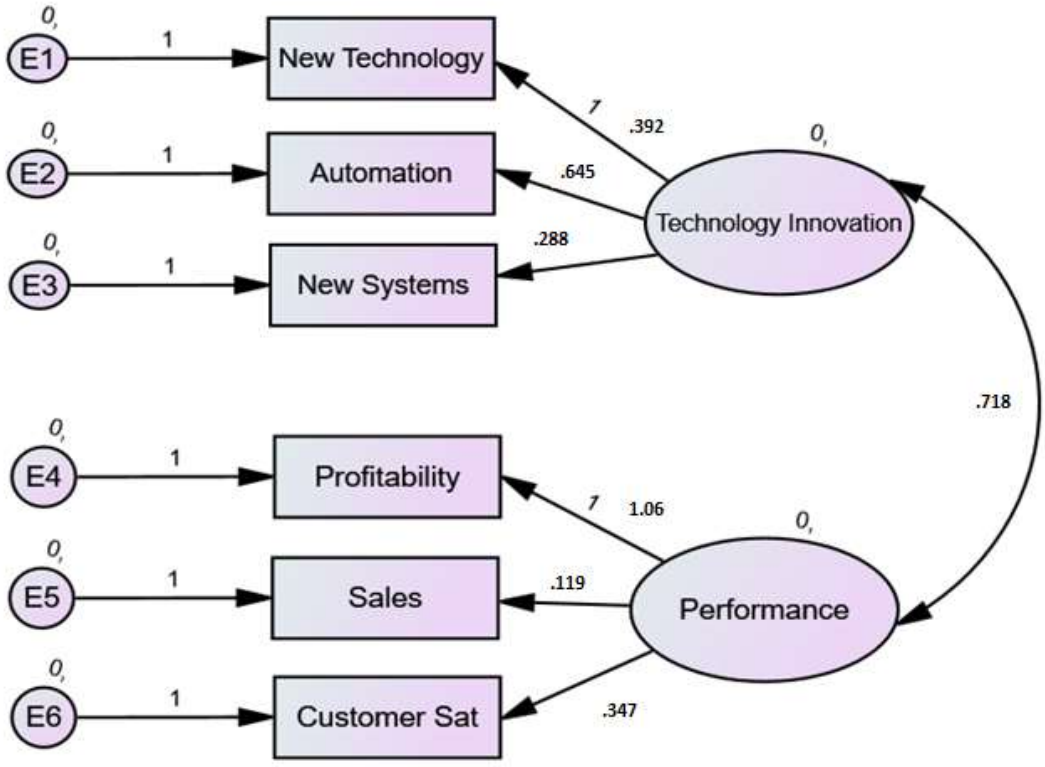

Figure 4.15: SEM on Technological Innovation Strategies

4.8.6 Overall Regression Model

The results presented in table 4.35 present the fitness of the regression model in explaining the study phenomena. The innovation strategies explained 81.4% of the performance of Data Service Providers in Kenya.

Table 4.36 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant as supported by F-statistic of 125.897 and a P-value of 0.000<0.05. This implies that innovation strategies (process innovation strategies, product innovation strategies, market innovation strategies, and technology innovation strategies) are good predictors of the performance of Data Service Providers.

Regression of coefficients results in table 4.37 shows that there is a positive and significant relationship between innovation strategies (process innovation strategies, product innovation strategies, market innovation strategies, and technology innovation strategies) and the performance of data service providers as supported by beta coefficient of 0.244, 0.234, 0.264 and 0.301 respectively. This was also supported by the t values whereby t-cal =2.750, 3.004, 3.364, and 3.618 > t critical =1.96 at a 95% confidence level which depicts that we reject the null hypothesis and accept the alternative.

Table 4.25: Regression Analysis Results on Overall Unmoderated Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.902[a]	.814	.808	.26048

Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.167	4	8.542	125.897	.000[b]
	Residual	7.803	115	.068		
	Total	41.970	119			

Regression of Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.106	.104		1.027	.307
	Process innovation strategies	.244	.089	.235	2.750	.007
	Product Innovation Strategies	.234	.078	.205	3.004	.003
	Market Innovation Strategies	.264	.079	.263	3.364	.001
	Technological Innovation Strategies	.301	.083	.282	3.618	.000

This implies that increase in process innovation strategies would increase the performance of Data Service Providers by 0.244 units. This also implies that increase in product innovation strategies would increase the performance of Data Service Providers by 0.234 units. An increase in market innovation strategies would increase the performance of Data Service Providers by 0.264 units. Further, this implies that increase in technological innovation strategies would increase the performance of Data Service Providers by 0.301 units.

4.8.7 The Optimal Model

The study sought to investigate the moderating effect of entrepreneurial orientation on performance of Data Service Providers in Kenya. To draw conclusions on the

objective regarding the moderating effect of entrepreneurial orientation on the relationship between innovation strategies on the performance of Data Service Providers in Kenya, the Moderated Multiple Regression model was adopted. This model involved generating a transformation variable as an interaction variable between entrepreneurial orientation and the performance of Data Service Providers in Kenya. The effect of a moderating variable is characterized statistically as an interaction that affects the direction and/or strength of the relationship between dependent and independent variables (Fakhrul & Selvamalar, 2014). The interaction variables were generated as intersections between the independent variables and entrepreneurial orientation. The interaction variables were then used in the hierarchical moderated multiple regressions.

Table 4.38 presents the analysis of moderating affect from the moderated multiple regression analysis of innovation strategies and performance of Data Service Providers in Kenya. Hierarchical regression was used as a stepwise regression analysis that produced and tested three models. Model one only constituted of the innovation strategies without considering the moderating variable. Model two was fitted including the moderating variable (entrepreneurial orientation) and model 3 included the interaction variables between the innovation strategies and the moderator entrepreneurial orientation. The fitness of all the three models were tested using, R^2 and ANOVA (F) and the coefficients of the models tested using T statistics. Model 1 results produced an R-square of 0.563 implying that the variation in the independent variable in the model explains 56.3% of the variation in performance of Data Service Providers in Kenya. The second model was found to have an R-square of 0.565. This shows that the variance of performance explained in the 2^{nd} model is 56.5%, with an R-square change of 0.002. The R-square change in the second step is however insignificant as shown by the change in F that has a p-value of 0.298 which is greater than 0.05. the P-value of the change in F being greater than 0.05 implies that the direct inclusion of the moderating variable entrepreneurial orientation has no significant change in the R-square and no significant improvement on the model from model one to model 2. The third model was fitted adding the interaction variables of the moderator and other independent variables. The third step of the MMR modeling had an R-square of 0.588 implying

that the variation in performance of data service providers explained in the 3rd model is 58.8%. Model three is an improvement of the first two models with a significant positive change in the R-square. The change in R-square for model three is 0.023, which is significant as shown by the P-value of the F-change, which was found to be less than 0.05. The p-value of the F-change is 0.001. This implies that inclusion of the interaction variables significantly improves the model. This further implies that the moderating variable entrepreneurial orientation has a moderating influence on the relationship between innovation strategies and performance of Data Service Providers in Kenya.

Table 4.26: Optimal Model

	Model 1			Model 2			Model 3		
	Beta	t	P-value	Beta	T	P-value	Beta	t	P-value
Independent variable									
(Constant)	.106	1.027	.307	.236	2.309	.063	.034	1.426	.160
Process Innovation Strategy	.244	2.750	.007	.186	4.771	.000	.280	5.522	.000
Product Innovation	.234	3.004	.003	.288	6.890	.000	.340	7.093	.000
Market Innovation Strategy	.264	3.364	.001	.229	6.515	.000	.317	6.640	.000
Tech. innovation strategy	.301	3.618	.000	.388	7.050	.000	.565	11.23	.000
Entrepreneurial Orientation				.103	2.043	0.008	.046	1.108	.022
Interaction Effect									
Process Innovation Strategy and Entrepreneurial Orientation							.092	1.745	.078
Product Innovation and Entrepreneurial Orientation							.308	5.175	.021
Market Innovation Strategy and Entrepreneurial Orientation							.284	3.707	.030
Tech. innovation strategy and Entrepreneurial Orientation							.458	6.056	.009
Model fitness									
R	0.902			0.752			0.767		
R Square	0.814			0.565			0.588		
Adjusted R Square	0.808			0.555			0.576		
ANOVA F	125.897		0.000	54.033		0.000	49.261		0.000
R Square Change	0.563			0.002			0.023		
Change in F			0.000	1.087		0.298	11.63		0.001

Model 1:

The first model in the moderation analysis is the overall model without the moderator as shown below:

$$\mathbf{Y = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Where:

Y = Performance

X_1 = Process Innovation

X_2 = Product Innovation

X_3 = Market innovation

X_4 = Technological Innovation

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4,$ = Regression coefficients of changes included in Y by each X value

ε = Error term which is normally distributed with a mean and variance of zero.

From the results on Table 4.38, all the innovation strategies (independent variables) had a significant influence on performance of Data Service Providers in Kenya based on the first model where only the independent variables (process innovation, products innovation, market innovation and technological innovation) are regressed against the dependent variable. The coefficients showed a positive relationship between all the variables and performance of Data Service Providers in Kenya. This is according to the significance values and the coefficients obtained against each variable. The result of the model generates an equation given as:

$$\mathbf{Y = 0.106 + 0.244X_1 + 0.234X_2 + 0.264X_3 + 0.301X_4.}$$

Model 2:

The second model is where the independent variables (process innovation, products innovation, market innovation and technological innovation) and the moderating variable (entrepreneurial orientation) are regressed against the dependent variable, with the moderator as an independent variable. This is meant to assess whether the moderator has any direct relationship with the dependent variable. The initial model was as shown below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 Z + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots \textbf{(vi)}$$

Where:

Z is the moderating variable (Entrepreneurial Orientation)

β_5 is the Regression coefficient for the moderator (now as a fifth independent variable)

The results as shown in Table 4.38 revealed that the inclusion of entrepreneurial orientation as an independent variable had a P-value of 0.008<0.05 and a Beta coefficient of 0.103, implying that entrepreneurial orientation had a direct significant influence on performance of the data service providers. This is an indication that when data service providers include entrepreneurial orientation in conjunction with the innovation strategies, they are likely to enhance performance by 10.3. The result of the 2nd model generates an equation given as:

$$Y = 0.236 + 0.186X_1 + 0.288X_2 + 0.229X_3 + 0.388X_4 + 0.103Z.$$

Model 3:

The results for model 3 show that addition of the interaction variables significantly improves the model on the influence of the innovation strategies on performance of

data service providers in Kenya. The change statistics show a p-value of 0.000, which is less than 0.05, which imply an improvement on the explanatory power by the moderating effect. The individual interaction variables were also found to all have significant influence on performance. The interaction variables between process innovation strategies, product innovation strategies, market innovation strategies, technological innovation strategies and entrepreneurial orientation were found to be have p-values of 0.007, 0.006 and 0.031 which are both less than 0.05 implying significance at 0.05 level of significance. The final model generated an equation given by;

$$Y = 0.034 + 0.250X_1 + 0.340X_2 + 0.317X_3 + 0.565X_4 + 0.046Z + 0.192X_1 * Z + 0.308X_2 * Z + 0.284X_3 * Z + 0.458X_4 * Z$$

The outcomes for model 3 demonstrate that expansion of the collaboration factors fundamentally improves the model because of the advancement procedures on execution of information specialist organizations. The change insights demonstrate a p-estimation of 0.078, which is more prominent than 0.05, which suggest noteworthy connection between procedure advancement technique and execution information specialist organizations with a mediator (innovative introduction).

From the investigation results, enterprising introduction has noteworthy impact on execution of Data Service Providers as far as supporting development and advancement advances new section or new pursuit creation which thusly can be a method for commercialization of advancements. The extension among business and advancement recommends that enterprise when coordinated with market-arranged culture contributes essentially to effective development. Likewise, Entrepreneurial introduction can give guidance to the company's whole task, filling in as an essential segment of an association's system.

An overall SEM model was carried out to establish the structural relationship between the innovation strategies and performance of Data Service Providers in Kenya. As the findings on Figure 4.16 portray, all the innovation strategies (process innovation, product innovation, market innovation and technological innovation) had

a positive influence on the performance of data service providers in Kenya. Entrepreneurial orientation on the other had had a positive impact on firm performance as well while it positively moderated the relationship between the innovation strategies and firm performance.

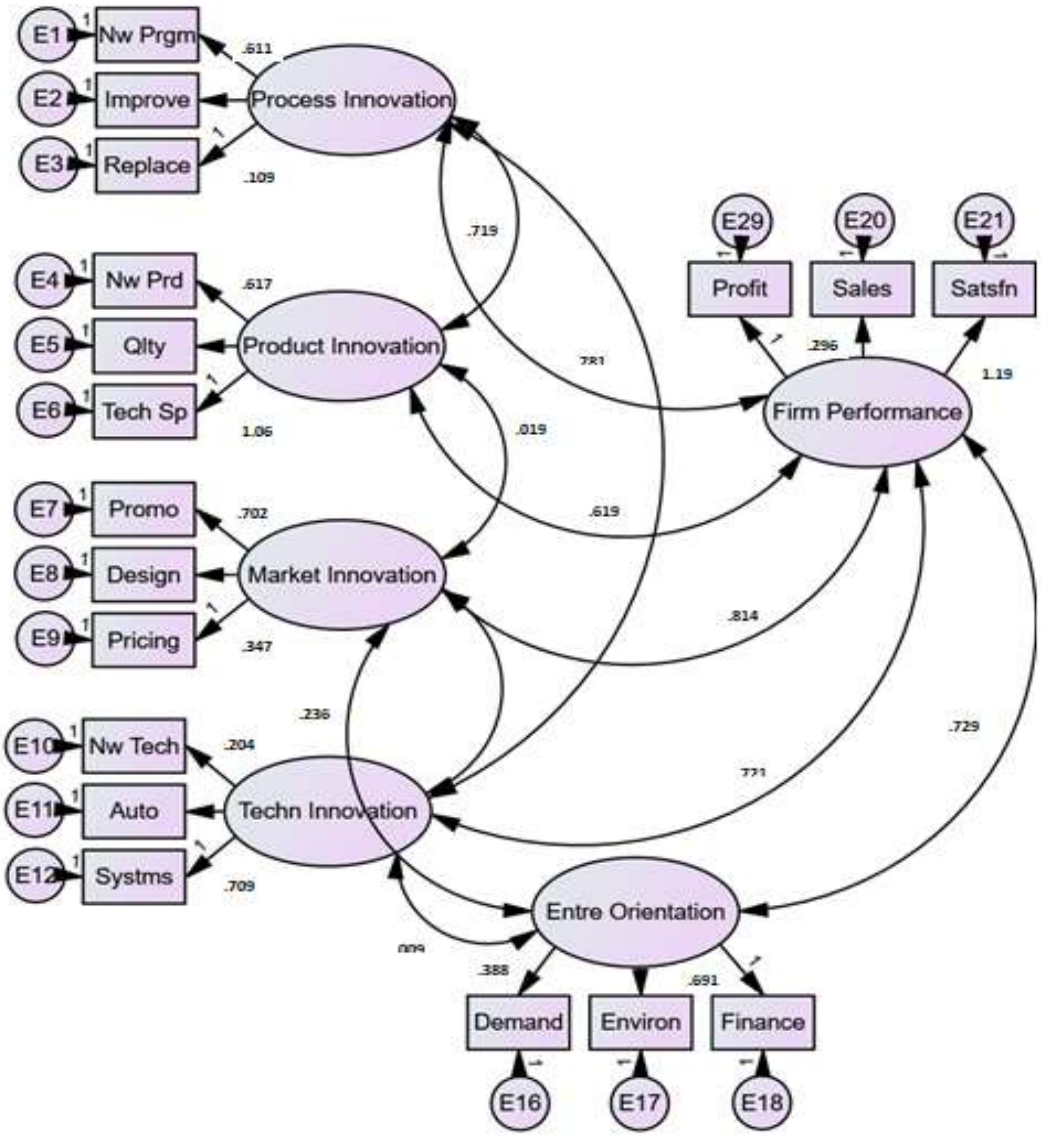

Figure 4.16: SEM Diagram for the Overall Model

4.8.8 Revised Conceptual Framework

From the overall model, it was established that the four independent variables (technological innovation strategies, process innovation strategies, product innovation strategies and market innovation strategies) had varied levels of

significance to the performance of data service providers in Kenya. While the previous conceptual framework had a "hypothesized" flow of the variables, the revised conceptual framework shows the actual flow of the variables based on the findings from the optimal model. The results also showed that entrepreneurial orientation had a significant moderating effect on the relationship between innovation strategies and performance of data service providers. This implies that the role of the variable cannot be dismissed in in promoting organizational-level behavior to perform risk-taking and engage in innovation.

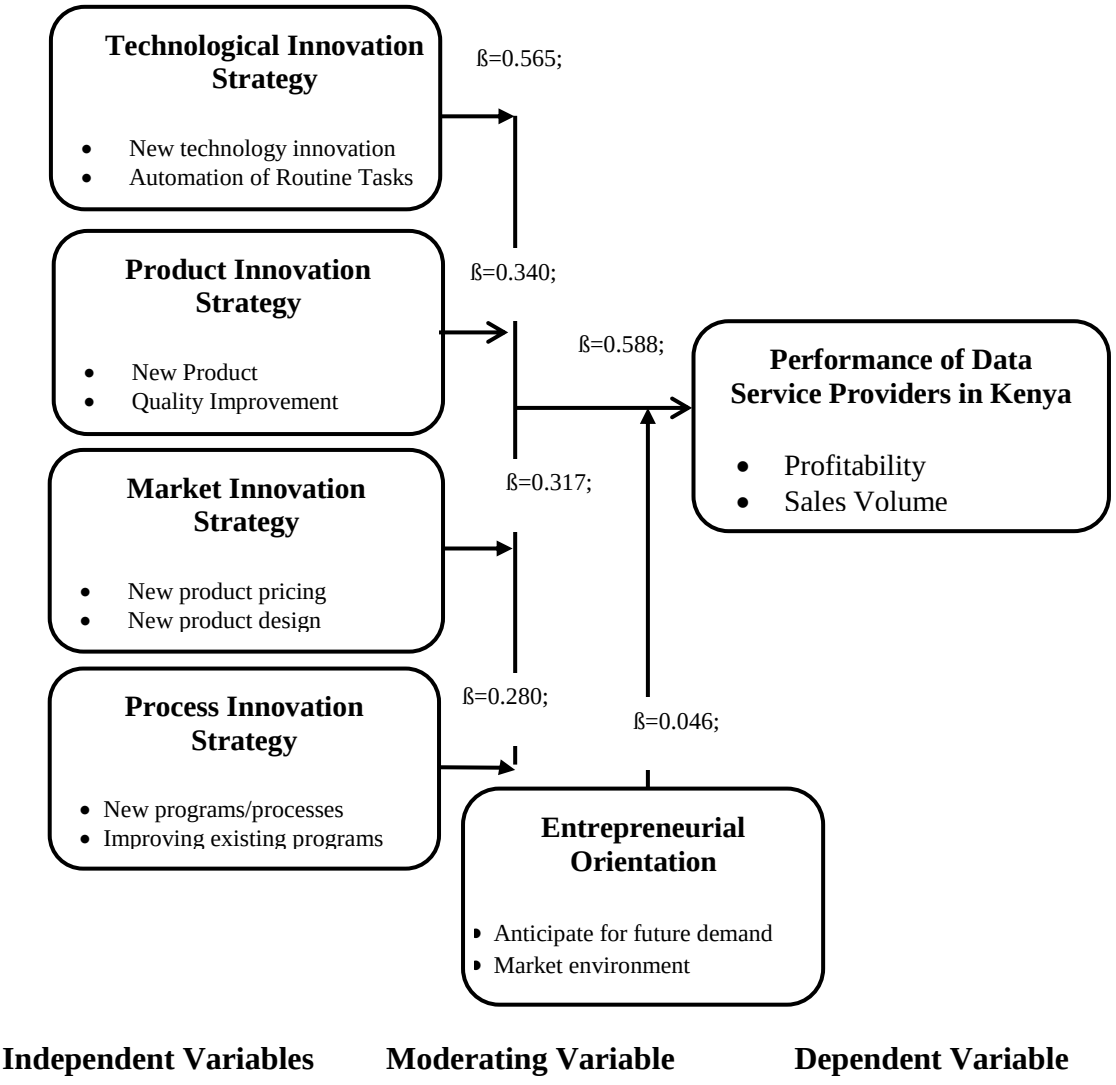

Figure 4.17: Revised Conceptual Framework

As the revised conceptual framework portray, technological innovation had the highest significance influence on the performance of the data service providers with a P-value of 0.000 and a Beta coefficient of 0.565. This was followed by product innovation with a Beta coefficient of 0.340 and a p-value of 0.000. Market innovation was third with a P-value of 0.00 and a Beta coefficient of 0.317 while process innovation was the last with a P-value of 0.000 and a Beta coefficient of 0.280. Entrepreneurial orientation had a significant moderating effect as shown with by a P-value of 0.022 and a Beta coefficient of 0.046. The implications of the findings highlight that entrepreneurial orientation has a weak moderating effect while technological innovation is the major aspect of innovation that steers organizational performance. According to Goedhuys and Veugelers (2012), the innovation strategies have varying levels of contribution to firm growth/performance based on the industry, operational market and other external forces. There are industries that market innovation will be more impactful than product or process innovation and vise-versa.

4.8.9 Summary of Hypothesis Testing

According to ANOVA Table 4.20, Table 4.23, Table 4.26, Table 4.29 and Table 4.32 the study performed individual tests of all independent variables to determine which regression coefficient may be zero and which one may not. The conclusion was based on the basis of p-value where if the alternative hypothesis of the p-value was rejected then the overall model was insignificant and if alternative hypothesis was not rejected the overall model was significant. The p-value was less than 0.05 then the researcher concluded that the overall model was significant and had good predictors of the dependent variables and that the results were not based on chance. This indicated that there was a significant relationship between the independent variable and dependent variables.

H_{01}: *Process innovation does not have a significant effect on the performance of data service providers in Kenya.*

Since the P-value is 0.000, which was less than 0.05, the hypothesis was rejected and it was concluded that there is a significant relationship between process innovation strategies and performance of Data Service Providers in Kenya.

H_{02}: *Product innovation does not have a significant effect on the performance of data service providers in Kenya.*

Since the P-value is 0.005, which was less than 0.05, the hypothesis was rejected and it was concluded that there is a significant relationship between product innovation strategies and performance of Data Service Providers in Kenya.

H_{03}: *Market innovation does not have a significant effect on the performance of data service providers in Kenya.*

Since the P-value is 0.015, which was less than 0.05, the hypothesis was rejected and it was concluded that there is a significant relationship between market innovation strategies and performance of Data Service Providers in Kenya.

H_{04}: *Technological innovation does not have a significant effect on the performance of data service providers in Kenya.*

Since the P-value is 0.000, which was less than 0.05, the hypothesis was rejected and it was concluded that there is a significant relationship between technological innovation strategies and performance of Data Service Providers in Kenya.

H_{05}: *Entrepreneurial orientation does not moderate the relationship between innovation strategies and the performance of data service providers in Kenya..*

Since the P-value is 0.000, which was less than 0.05, the hypothesis was rejected and it was concluded that entrepreneurial orientation moderates the relationship between process innovation strategy, product innovation strategy, market innovation strategy, technological innovation strategy and the performance of Data Service Providers in Kenya.

Table 4.27: Summary of Hypotheses Testing

Hypothesis	Coefficient P-Values	Conclusion
H_{01}: Process innovation does not have a significant effect on the performance of data service providers in Kenya	P=0.000<0.05	Reject H_o
H_{02}: Product innovation does not have a significant effect on the performance of data service providers in Kenya	P=0.000<0.05	Reject H_o
H_{03}: Market innovation does not have a significant effect on the performance of data service providers in Kenya	P=0.000<0.05	Reject H_o
H_{04}: Technological innovation does not have a significant effect on the performance of data service providers in Kenya	P=0.000<0.05	Reject H_o
H_{05}: Entrepreneurial orientation does not moderate the relationship between innovation strategies and the performance of data service providers in Kenya.	P=0.000<0.05	Reject H_o

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary, conclusion and recommendations of the study. The interpreted data and the results of the findings are linked with both empirical and theoretical literature. The conclusion relates directly to the research hypotheses and discussion of the study findings while injecting forth important academic and managerial implications based on empirical suggestions on innovation strategies and entrepreneurial cognizance, that advantage increased levels of performance.

5.2 Summary of Major Findings

The study sought to establish the influence of innovation strategies on performance of Data Service Providers in Kenya. The study specifically determined the effect of process innovation strategies, product innovation strategies, market innovation strategies, technological innovation strategies on the performance of Data Service Providers in Kenya. Additionally, the study took cognizance of the perceived moderating effect of entrepreneurial orientation on the relationship between innovation strategies and performance of Data Service Providers in Kenya. The study registered good response as 68% of the questionnaires were filled and returned. The rate of 68% was appropriately good for drawing conclusions in the study. The study showed that the overall model was significant at 5% level of significance as it showed that predictors positively influence performance of Data Service Providers in Kenya.

The analysis of descriptive statistics in the study, showed that respondents agreed that innovation strategies influence performance of Data Service Providers in Kenya. The study model shows that all the innovation strategies (independent variables) had a significant influence on performance of Data Service Providers in Kenya. The coefficients also showed a positive relationship between all the variables and performance of Data Service Providers in Kenya. The model showed that addition of

the moderating variable to the initial model doesn't improve the model. It however found that in the joint model with the innovation strategies, the moderating variable entrepreneurial orientation had significant direct influence on performance of Data Service Providers in Kenya. The model further show that addition of the interaction variables significantly improves the model. In general, the reviewed literature and the analysis of descriptive statistics in the study, concluded that innovation strategies influence performance of Data Service Providers in Kenya. The major findings summarized from the five specific objectives are as follows.

5.2.1 Process Innovation Strategies

The study sought to establish the effect of process innovation strategies on performance of Data Service Providers in Kenya. Results on the analysis of the variance indicate that the overall model was statistically significant, implying that Process Innovation Strategies variable is a good predictor of the performance of Data Service Providers. Regression of coefficients results revealed that there is a positive significant relationship between process innovation strategies and the performance of data service providers. This research study finds empirical support for mostly anecdotal evidence regarding the effect of process innovation on firm performance.

5.2.2 Product Innovation Strategies

The study sought to establish the effect of product innovation strategies on performance of Data Service Providers in Kenya. Regression of coefficients results show that there is a positive significant relationship between product innovation strategies and the performance of Data Service Providers.

.2.3 Market Innovation Strategies

The study established that market innovation strategies, as an independent variable, had a significant and positive influence on the performance of Data Service Providers. This influence remained positive and significant in a multiple regression analysis showing that market innovation strategies played a vital role with the other variables in influencing performance of Data Service Providers.

5.2.4 Technological Innovation Strategies

In establishing the effect of technological innovation strategies on the performance of data service providers in Kenya, the study found technological innovation strategies had the highest significance influence on the performance of the data service providers. The analysis of the variance results indicated that the overall model was statistically significant. Regression of coefficients results also showed that there is a positive significant relationship between technological innovation strategies and performance of data service providers.

5.2.5 Entrepreneurial Orientation

The study established that entrepreneurial orientation moderates the relationship between innovation strategies, and the performance of data service providers. For successful performing firms, the study established a mesh of mediating effect of entrepreneurial orientation in form of organizational culture, skills and efforts inherent in employees that consistently enhance entrepreneurship through innovation and exploitation of opportunities inherent in the firm. The findings affirm that the attainment of such objectives hinges on maintaining entrepreneurship activity tempo within an organization which lies in understanding and recognizing the entrepreneurial potential of all employees, while creating a suitable innovative fueled environment that allows employees to act on their best potential.

5.3 Conclusions

The study sought to assess the effect of innovation strategies and the moderating effect of entrepreneurial orientation on the performance of Data Service Providers in Kenya.

The first specific objective was to examine the effect of process innovation strategy on the performance of data service providers in Kenya. The study found that process innovation is directly related to firm performance. The study established that success in performance of firms hinges on adopting modern technology in the development of new processes while updating and improving processes on service offerings. The

successful adoption of process innovations proved successful with introduction of innovative skills development practices based on new technologies acquired by the firms. Through changes in in offering services differently processes innovation was found contributive to competitive advantage from knowledge that is rare valuable, imitable and sustainable. Additionally, skills and knowledge resources were found effective in helping firms to decide on new processes in the utilization of technology.

The second specific objective was to establish the effect of product innovation strategy on performance of data service providers in Kenya. In determining the influence of product innovation on performance of Data Service Providers, majority of the respondents observed that product innovation strategies influenced firm's performance. Respondents agreed that development of new products is essential for better performance of Data Service Providers in Kenya with respondents indicating that product innovation could be achieved through creation of customer friendly products and increasing product portfolio. Regression of coefficients results indicate that there is a positive significant relationship between product innovation strategies and the performance of Data Service Providers. This is further supported by outcomes of Structural Equation Model (SEM) that confirm, that product innovation positively contributed performance of Data Service Providers. The study concludes that product innovation strategies in the development of new products and improvement of existing products entice customers to switch brands from rival brands as it becomes more attractive to the customers translating into good firm performance. The study finds this significant as a move to delivering solutions especially in today's world where customers have migrated from ordering products and services to ordering solutions. This can precipitate firms Data Service Providers to position themselves as solutions providers where the customer describes the offering they require while the company looks after the technicalities.

The third specific objective of the study was to determine the effect of market innovation strategy on the performance of data service providers in Kenya. The study concluded that market innovations contribute to firm performance. The findings

showed that majority of the respondents indicated that market innovation strategies influenced firm performance to a moderate extent. The findings revealed that most of the respondents consider listening to the customers and focusing on their needs as one way towards enhancing market innovation. On the other hand, respondents agreed that new product/service pricing, new product design and new product promotion techniques are important in the realization of effective market innovation strategies. The findings revealed that most of the respondents consider listening to the customers and focusing on their needs as one way towards enhancing market innovation. Regression of coefficients results show a positive significant relationship between market innovation strategies and the performance of Data Service Providers. This is augmented by findings from structural equation modeling (SEM) revealing that the three parameters of market innovation; product design, product pricing and product promotion had a positive impact on overall contribution of market innovation with product promotion having the strongest impact. The study considers the degree of consistence towards customer alertness as helpful in discovering a "fit" between particular market needs and specific resources inherent in the firms thereby creating a "match" of market needs and resources.

The fourth specific objective of the study was to assess the effect of technological innovation strategy on the performance of data service providers in Kenya. The findings revealed that majority of the respondents indicated that technological innovation strategies influence firm performance. Respondents in the study confirmed that technological innovation strategy involves adoption of new technology and adoption of new systems and automation of routine tasks. Findings suggest that technological innovation strategy is achieved by increasing investments in innovation technology. Regression of coefficients results shows that there is a positive significant relationship between technological innovation strategies and the performance of Data Service Providers. Results from SEM registered automation of processes being the parameter with the strongest impact on the technological innovation.

The fifth specific objective of the study was to determine moderating effect of entrepreneurial orientation on the relationship between innovation strategies and

performance of data service providers in Kenya. The findings show that majority of the respondents agreed that entrepreneurial orientation influence firm performance to a moderate extent, From the findings, respondents agreed that through entrepreneurial orientation, the firm is able to introduce new products/services ahead of the competitors, and the firm is able to anticipate for future demand. Additionally, the study found that through entrepreneurial orientation, the firm is able to influence market environment and the firm to penetrate into new ventures. The study established that though proactivenes and risk-taking posture, entrepreneurial orientation enables the firm to source for external finances thus providing ability to adopt new technologies as well as introduce new processes

5.4 Recommendations

The findings provide qualitative empirical support for theoretical claims of contribution of innovation strategies on performance of Data Service Providers. Several recommendations can be crafted from the study results:

5.4.1 Process Innovation Strategies

There is pivotal need in developing new programs and processes that embrace facets of technology and skills brought about by information and communications technology knowledge (ICT). This is because data service firms operate within a characteristically fertile platform of modern-day technological revolution driven by internet that provide innovation opportunities of new range of products and services such as, e-business, mass customization, effective customer relationship management, and efficient e-products

5.4.2 Product Innovation Strategies

The study recommends quality improvement, and creation of customer centric defined products in improving product innovation. Managers should opt for co-creation of friendly products through interaction with customers. The interaction can enable co-creation of value and the concurrent production-consumption activities performed by the service firm and the customer in the service delivery process.

5.4.3 Market Innovation Strategies

The study recommends market mapping through listening to customers' opinion as helping tool in customizing value innovation which can be furthered by altering service products, process and personnel structure to meet customers' special needs in specific use situations. As such, organizations are expected to understand their customers and adapt themselves to their evolving demands to increase their performance especially, in service firms where the customer is a resource and the assessor of the innovations.

5.4.4 Technological Innovation Strategies

The study recommends data service providers to embrace innovations based on internet data platforms that bring a different value proposition. Technological innovations, such as social media, mobile commerce, cloud computing, and many others have presented a vast array of opportunities for innovating organizations to take and develop. The study suggest that firms should develop employee innovation capabilities since firm capabilities happen by integration of specialist knowledge across a number of individuals, and are associated with the development of organizational competences and routines

5.4.5 Moderating effect of Entrepreneurial Orientation

The study recommends managers to encourage entrepreneurial behavior through recognition and subsequent exploitation of entrepreneurial opportunities within employees. This may be achieved by screening for entrepreneurial potential during recruitment of new staff and integrate potential holders into mainstream innovation and entrepreneurial incubation.

5.5 Contribution of the study to theory/existing knowledge

The study provides the following contributions to the body of knowledge: First, the study adds to the existing body of knowledge by advancing knowledge on the effects of innovation strategies on data service providers in Kenya.

Second, contribution by the current study point to a rare dimension that innovation takes place more where customer–firm interface offers a key avenue for competitive innovation development. For this reason, customization, specification, involvement and timing innovations identified in this study show the way through which data service managers can effectively deploy customers as resource and partners (co-creators of value) in shaping innovation activities.

Third, this study has its meaningful merit in contribution to existing knowledge by supporting that technology innovation strategies contribute more to firm performance, than other strategies as captured by this study. Support of the finding is found in proliferation of evolving technology in data service industry enabling the creation of a new range of products and services in the real and virtual worlds. Based on findings that adoption of technology increase competitiveness and enables organization s to improve business processes and increase the market size.

Finally, this study has important academic and managerial implications as it assists in understanding emphasis on innovativeness that depends on the tacit knowledge and entrepreneurial behaviors of those involved.

5.6 Areas for Further Research

The study has shown that there is need for further research on other innovation strategies that can augment firm performance in Data Service Providers in Kenya. Future research is recommended to apply a longitudinal study to better capture the relationships between innovation strategies, entrepreneurial orientation and performance of Data Service Providers. Using mixed methods research would yield better validated results. Moreover, conducting a comparative analysis with data service firms in other regions can give a better insight of the innovation strategies, entrepreneurial orientation and performance relationship in companies operating in environments that have some common characteristics

In order to develop a comprehensive model, future research could investigate the role of broader industry factors in Data Service Providers such as size of firms and capital

outlay or more inclusive list of factors, since such factors can influence innovations and performance.

The study focused on the Data Service Providers operating in Kenya and consequently findings are mostly generalizable to this context. Further studies are recommended especially within a broader boundary, industry and market context.

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APPENDICES

Appendix I: Introduction Letter

REF: REQUEST TO COLLECT DATA FOR ACADEMIC PURPOSES

I am a PhD student at Jomo Kenyatta University of Agriculture and Technology and as part of the requirements for the award of the Degree, I am supposed to undertake a research on a practical problem on my area of specialization. I'm seeking to assess **"Innovation strategies, Entrepreneurial Orientation and Performance of Data Service Providers in Keny**a". The information being sort will be treated with utmost confidentiality and will only be used for academic purposes. I'm seeking your assistance in filling the attached questionnaire. All the help offered will be highly appreciated.

With Regards

Lazarus Nduati

Appendix II: Questionnaire

This questionnaire is meant to gather information regarding the influence of innovation strategies on performance of data service providers in Kenya.

SECTION A: BACKGROUND INFORMATION

1. How long has your company been operating in Kenyan Market?

   Less than 5 Years [ ] 5 – 10 Years [ ]

   11 – 15 Years [ ] Over 15 Years [ ]

2. How many products/services does your company offer in the data service sector?

   Only 1 [ ] 2 - 3 [ ] 4 – 6 [ ] Above 6 [ ]

3. How many markets does your company operate in?

   Only 1 [ ] 2 - 3 [ ] 4 – 6 [ ] Above 6 [ ]

4. For how long have you worked in the company?

   Less than 1 year [ ] 1 - 5 years [ ] 6 – 10 years [ ] Above 10 years [ ]

SECTION B: PROCESS INNOVATION STRATEGIES

5. To what extent does process innovation strategies influence the performance of your firm? Small Extent ( ) Moderate Extent ( ) Great Extent ( )
6. Please indicate your agreement or otherwise with the following statements relating to process innovations strategies.

Statement	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]
The firm's technical team develops new programs from time to time					
The organization updates its programs on regular intervals					
The organization replaces existing programs/processes in case of failure.					
The organization adopts modern technology in the development of new processes.					
Process innovations strategies are key to the effective operation of the organization.					
The organization undertakes regular changes in its organizational structures					
One of the process innovation strategies that firms adopt is changes in organizational culture.					

7. What other ways can data service providers achieve process innovation?.....

   ……

   ……

   ……

   ……

SECTION C: PRODUCT INNOVATION STRATEGIES

8. To what extent does product innovation influence the performance of your firm?

   Small Extent ( ) Moderate Extent ( ) Great Extent ( )

9. Please indicate your agreement or otherwise with the following statements relating to product innovations.

	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]
Development of new products is essential for expansion of our company					
Our organization has been keen on developing new products					
The company has been committed to improve existing products.					
Our organization has been focusing on quality improvement to achieve product innovation					
Embracing key enhanced technical specifications has been upheld in our company					
Our organization has continually created customer friendly products					
The organization has regularly updated its product portfolio					

10. What other ways can data service providers achieve product innovations?

    .....

    .....

    .....

    .....

SECTION D: MARKET INNOVATION STRATEGIES

11. To what extent do market innovations influence the performance of your firm?

    Small Extent ( ) Moderate Extent ( ) Great Extent ( )

12. Please indicate your agreement or otherwise with the following statements relating to market innovations.

Statements	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]
The organization has been keen on listening to opinions of the customers to enhance its market					
The organization always adopts new product pricing to capture new market					
Introducing new product designs has been an essential move in our organization to realize the market					
The company focuses on the market in which it has competitive strength.					
The organization has continually promoted its new products to achieve more market					
Product replacement has been upheld in our organization as an effective move to capture the market					
Application of changing market orientation is upheld in the organization to enter/expand markets					

13. What other ways can data service providers achieve market innovations?.....

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.....

.....

SECTION E: TECHNOLOGICAL INNOVATION STRATEGIES

14. To what extent do technological innovations influence the performance of your firm?

    Small Extent ( ) Moderate Extent ( ) Great Extent ( )

15. Please indicate your agreement or otherwise with the following statements relating to technological innovations.

Statements	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]
Adoption of new innovative technologies has been a move by the firm to enhance effectiveness					
The company has been introducing new technologies in its process to strengthen on technological offerings					
The company has in the recent past adopted new systems to enhance efficiency					
The company has continually increased investments in innovative technology over the recent past					
The firm has been implementing automation through technology					
The firm has benefited from inter-organizational collaborative processes through technology					
There has been intra-organizational processes in our company through embrace of technology					

16. What other ways can data service providers achieve technological innovations?....

.....

.....

.....

.....

SECTION F: ENTREPRENEURIAL ORIENTATION

17. To what extent does entrepreneurial orientation influence the performance of your firm?

    Small Extent ( ) Moderate Extent ( ) Great Extent ( )

18. Please indicate your agreement or otherwise, with the following statements relating to entrepreneurial orientation.

	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]
Through entrepreneurial orientation, the firm is able to introduce new products/services ahead of the competitors.					
Through entrepreneurial orientation, the firm is able to anticipate for future demand.					
Through entrepreneurial orientation, the firm is able to influence market environment.					
Entrepreneurial orientation results to the firm penetrating into new ventures					
Entrepreneurial orientation enables the firm to source for external finances					
Through entrepreneurial orientation, the firm is able to adopt new technologies					
Through entrepreneurial orientation, the firm is able to introduce new processes					

SECTION G: PERFORMANCE

19. How can you rank the effectiveness of the following innovation strategies in influencing performance of the firm? (1=most effective, 4=least effective)

Aspect	**1**	**2**	**3**	**4**	**5**
Process Innovation					
Product Innovation					
Market Innovation					
Technological innovation					

20. Please indicate your agreement or otherwise, with the following statements relating to performance of data service providers in Kenya.

	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]
Our company has continually recorded improved profitability over the past five years					
The profit margins in our company have been increasing over the years					
The sale volumes of the firm have been increasing over the last five years					
There is an overall improvement service delivery time in our company over the recent past					
The company has continually enhanced customer satisfaction through its efficient services					
The number of customer complaints have drastically dropped with the continued embrace of innovation					

Appendix III: List of Data Service Providers

	DATA SERVICE PROVIDERS
1	Wananchi Telecom Limited
2	Liquid Telecommunications Kenya Limited
3	Access Kenya Limited
4	Safaricom Limited
5	Jamii Telecommunication Limited
6	Swift Global
7	Call Key Networks Limited
8	Tangerine Limited Pwani Telecomms
9	Bidii Dot Com
10	Mobile Pay
11	Africa Online
12	Habarinet
13	Inter connect
14	internet Solutions
15	ISP Kenya
16	ItNet East Africa
17	iwayAfrica
18	Karibu Networks
19	KenyaWeb.com
20	SimbaNet
21	Mawingu Networks Limited
22	Argon Telecom Services Limited
23	Telkom Kenya Limited
24	Mobile Telephone Networks Business Limited
25	Sema Mobile Services
26	Airtel Kenya
27	Dotsavvy Ltd
28	Fireside Communications Ltd
29	Insight Technologies Ltd
30	C Hear (K) Ltd
31	Aster Global services Kenya Ltd (AGSKL)
32	Fibre Link Ltd
33	Geotel Internet Services
34	Enterprise Data Freedom Limited
35	Zuku Kenya Ltd
Total	

Appendix 1V: Research Statutory Documents

JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY
WESTLANDS CAMPUS

P. O. BOX 62000 NAIROBI 00200, KENYA• Tel. 020-4447650• Fax. 020-4448679•E- Mail:nbicentre@jkuat.ac.ke

JKU/04/ HD418-C003-8123/15

8th August, 2018

TO WHOM IT MAY CONCERN

LAZARUS NDUATI

This is to confirm that the above named is a student at Jomo Kenyatta University of Agriculture &Technology – Westlands Campus, undertaking a Doctorate degree in Strategic Management.

It is a requirement that the student undertakes a Research Thesis in a relevant field in order to improve on his skills. Mr. Nduati's Research is on **"Effect of Innovation Strategies on Performance of Data Service Providers in Kenya."** This Research is Purely Academic.

Any assistance given to him will be highly appreciated and if you need clarification please contact the undersigned.

Thank you.

JKUAT WESTLANDS CAMPUS
10 AUG 2018

PROF. A. IRAVO
Ag. Principal

JKUAT is ISO 9001:2008 and 14001:2004 CERTIFIED
Setting Trends in Higher Education, Research and Innovation

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/18/37594/24812** Date: **24th August, 2018**

Lazarus N Nduati
Jomo Kenyatta University of
Agriculture and Technology
P.O. Box 62000-00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Effect of innovation strategies on performance of data service providers in Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **23rd August, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.

THIS IS TO CERTIFY THAT:
MR. LAZARUS N NDUATI
of JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, 60871-200 Nairobi,has been permitted to conduct research in *Nairobi County*

on the topic: *EFFECT OF INNOVATION STRATEGIES ON PERFORMANCE OF DATA SERVICE PROVIDERS IN KENYA*

for the period ending:
23rd August,2019

.....
Applicant's Signature

Permit No : NACOSTI/P/18/37594/24812
Date Of Issue : 24th August,2018
Fee Recieved :Ksh 2000

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A 20342

CONDITIONS: see back page