PREDICTIVE DATA ANALYSIS AND COMPETITIVE ADVANTAGE OF JADE COLLECTIONS CLOTHING RETAIL STORES, NAIROBI.

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES UNIVERSITY OF NAIROBI

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DECLARATION

This research project is my original work and has not been presented to any university for any academic award.

Signature …… ~~Kiboma~~ ……. Date: ……**November 24th, 2022**……

Linda Gechemba Kiboma

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This research project has been submitted for examination with my approval as the University Supervisor.

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ABBREVIATIONS & ACRONYMS

BI   Business Intelligence

CA   Competitive Advantage

CBD   Central Business District

GDP   Gross Domestic Product

ICT   Information Communication Technology

PDA   Predictive Data Analysis

PU   Perceived Usefulness

ROI   Return on Investment

TAM   Technology Acceptance Model

TOE   Technology Organization Environment

SMEs   Small and Medium Enterprises

SA   Statistical Analysis

SAS   Statistical Analysis System

ABSTRACT

The objective of this study was to determine the extent to which the Jade Collections retailing store uses predictive data analysis to gain competitive advantage. This study used a case study research design and collected qualitative data from the ICT manager and head of marketing through in-depth interviews. Among the study findings, it was established that predictive data analysis is carried out on a large scale, and this analysis is done at the head office and results cascaded downwards, that is to the branches through the branch managers. Key predictive data at Jade Collections is from sales data. The company also collects social media data though is done on a fairly low scale. The data collected is reviewed by a team of analysts working in the operations department under the Head of the Consumer Department and findings are used to inform business decisions in the company like the introduction of new items, or getting rid of dead stock. The company has improved customer experience by arranging products systematically at the stores and created differentiation by introducing variety of products; as a result Jade Collections has gained competitive advantage. Concerning cost leadership, the findings show that predictive data analysis has had a relative advantage on the sales at Jade Collections because the management makes decisions based on the data collected and analysed, this has improved the clothing apparels understanding of customer trends and customer's behaviour. The data collected and analysed also helps them decide on when and how to introduce a new product and make decisions on slow-moving items. Among the study conclusions; competitiveness at Jade Collections and in the clothing retail business at large can be examined from the dimension of cost reduction through the use of technology, high efficiency of the business in terms of service delivery, quality products, and superior customer service and client management. Among others, the study recommends that there is the need to channel more resources towards the utilization of technology. The study suggests that the clothing apparel store should continue to utilize creative online marketing strategies to engage consumers directly and more personally with the clothing brands. Jade Collections should also keep abreast of new developments in the technological front so as to maintain or gain a competitive advantage in the industry.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The 21st-century business environment has been characterized by increasing competitive pressure, volatility and a fast pace of changing demand. Businesses need to sustain a competitive advantage and come up with ways in which personalized goods and services can be offered through new and emerging technologies. Most of these technologies have been based on the exploitation of data to improve performance. Predictive data analysis has been one of the most salient factors for most organisations to not only gain competitive advantage but also increase organizational efficiency (Hasan, 2021).

Competitive advantage and profitability can be determined through Porter's (1985) five forces, the threat of new entrants to the industry, rivalry among existing competitors, the threat of substitutes, the bargaining power of buyers and the bargaining power of suppliers. In addition, industries like insurance, manufacturing, and banking have for long been known to tap into using predictive analytics and related technologies in making decisions and thereby gaining great value in improving customer satisfaction, doing focused marketing, reducing fraud as well as the effectiveness of activities at the internal level (Manyika *et al.*, 2011). Technology helps retail clothing stores to compete globally which results in stiffer competition for local companies (Ngugi, 2016). For businesses to have an understanding as well as extract business value accrued from predictive data analysis, technology becomes vital in the configuration of competitive advantage and related strategies based on the sequences and trends in a competitive market.

The study is founded on three theories; Technology Organisation Environment (TOE), Technology Acceptance Model (TAM), and Investment Theory – Forecasting and Modelling Investment. Technology Organisation Environment (TOE) and Technology Acceptance Model (TAM) help to predict user and customer behaviour by considering three main components: the first human attitude, the second social influence and the third perceived behaviour control (Huda, et al, 2012). Investment Theory is used to develop business strategies by collecting past data and analysing it to identify patterns to make informed business decisions. The three theories will be vital in explaining factors that

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promote the ability to use and accept technology, as well as the use of predictive analysis by companies.

The clothing retail industry is commonly referred to as the apparel industry and majorly comprises manufacturers, suppliers and distributors of fashionable clothing for kids, men and women (Strahle, 2017). Demand for clothing products has led to intense competition in the market and as a result rapid growth of companies within the industry (Strahle, 2017). There are various studies done on disruption in the clothing retail industry across the globe, but contrary to expectations and predictions, the industry has already been disrupted resulting in new shopping orders and experiences (Consumer, 2018). The unprecedented utilization of digital technologies in the creation of competitive advantage has occasioned the emergence of predictive data analysis, as a tool for small and medium enterprises to gain a competitive edge. According to Manyika *et al* (2011) for one to reap the benefits of predictive data analysis the team leaders in small enterprises need to consider a high level of skill development that is compatible with the emerging and highly dynamic technological environment. The onset of the Novel Covid 19 pandemic has also heightened the already high competition among those operating in Small and Medium Enterprises more so those in clothing retail shops. In particular, the rule of social distancing has pushed customers away and most of them prefer the online market where one on one contact is minimized (Macharia, Joseph & Okiro, 2020). An empirical study would be vital to understand how SMEs today are utilizing predictive data analysis to gain a competitive advantage.

1.1.1 Predictive Data Analysis

Predictive data analysis has been described by Eric (2018) as a process that involves the Collection, transformation, cleaning as well as remodeling of data sequences and series while aiming at having insights into actions and having a consensus on the necessary forecast to make informed decisions. While supporting this argument, Babu and Sastry (2014) opined that the ability to make almost accurate predictions, in a market analysis of both unstructured and structured data can be important for a business to do an enhancement of the main performance metrics and therefore have much better strategic decisions that will translate into more accrued revenues.

According to Shmueli and Koppius (2011), predictive data analysis as a technology is used to develop and evaluate a forecast model based on readily available data. This implies the inclusion of empirical predictive models which can forecast events in the future. It, therefore, serves two major functions. The first one is to identify the interconnectivity of various factors that drive business, while the second one is the forecast of particular events based on the interconnections established thereon before (Najdenov & Makhoul, 2015). To predict or to forecast can be described as a statement about uncertain events. Lizieri (2011) describes three basic types of predictive data analysis and forecasting models, they include time series analysis models, qualitative models and casual models. These models are useful for sales forecasting, trend spotting and product recommendation. (Kauffman, 2012).
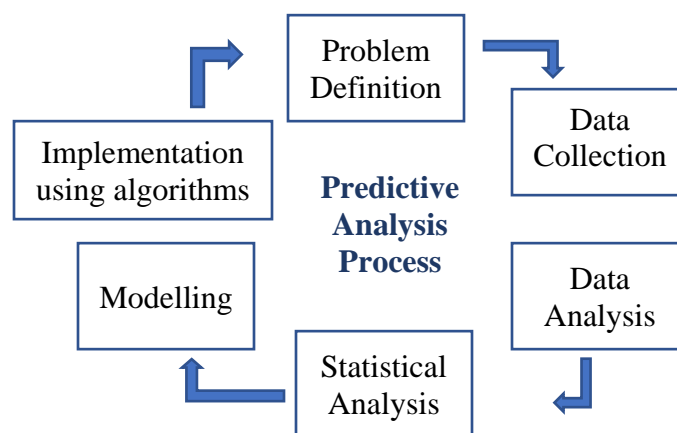
Figure 1: Predictive Analysis Process; Source (SAS, 2021)

1.1.2   Competitive Advantage

A business enterprise can gain a competitive advantage when it can defend itself against the forces of competition and is most suited over its rivals to secure and retain customers (Namenda, 2018). To have a competitive edge, therefore, is to deliberately and consciously institute measures to identify the target market in which they offer goods or services as well as other benefits that are better than the competitors (Porter, 1985). Porter has explained three main ways in which business enterprises can realise a competitive edge. Cost leadership, differentiation, and the focus strategy. In this case, differentiation strategies will usually involve making deliberate steps that ensure the

provision of services and goods are differentiated from the rest within the same market since their attributes stand out. Such attributes may be the quality, the delivery factor or the customer experience. Through the use of predictive data analysis business enterprises can easily understand the behaviour of their consumers, thereby offering products and prices that meet their specific needs. The cost leadership strategy sees to it that business enterprises can offer considerably lower prices usually as a result of efficiency in operations and continuous improvement. Ochieng (2015) notes that applying predictive analytics has been growing in Kenya and as a result, operational efficiency has been better managed. The Focus strategy can be interpreted as a strategic direction taken by enterprises to concentrate on a specific market and therefore employ differentiation or cost leadership strategies and thereby customize their products and services.

When combined with other capabilities and resources, predictive data analysis can give retail clothing outlets a better market positioning in the larger business environment. As established by Galletti & Papadimitrion (2013), it is about making use of synergy-based relationships and combining them with other organizational resources, where empirical evidence was provided to show that implementing big data analysis is vital for competitive advantage.

1.1.3   Retail Clothing Industry

The clothing retail industry is commonly referred to as the apparel industry and majorly comprises kids' wear, and male and female fashionable clothing (Strahle, 2017). There are various studies done on disruption in the clothing retail industry across the globe, but contrary to expectations and predictions, the industry has already been disrupted resulting in new shopping orders and experiences (Consumer, 2018). Consumers have become more price sensitive and are focusing more on distinct products of higher quality. Apparel firms around the world have had to innovate to grow. Differentiation in the apparel industry seeks to match customer needs and wants through the provision of products and services that offer value and benefit to the customer and at the same time are unique from other competitors. According to Porter (1985), a differentiation strategy advocates that a business must offer products or services that are valuable and unique to buyers above and beyond a low price. The ability of a company to offer a premium price for its products or services hinges upon how valuable and unique these offerings are in the marketplace.

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Studies done by Hivos (2016) showed that the apparel industry has expanded tremendously over the past years. Companies like LC Waikiki, Vevo, Deacons, and City Walk have established a retail network across Eastern Africa region with branches in Uganda, Tanzania and Rwanda. Regardless of the numerous branches across the continent, these companies still face fierce competition from other boutiques that operate in these regions.

The clothing retail sector in Nairobi City County is dominated by the informal business sector, characterized by stalls and "exhibitions". Some of these "Stalls" have grown and operated as larger stores or a chain of stalls (Chege, 2013). The cutthroat competition in this market has forced retailers to adapt and innovate to gain some form of market share and eventually a competitive edge. Businesses have also had to respond to changes in the business environment including the effects of Covid 19. Such innovations have led to the adoption of big data analysis and artificial intelligence to gain a competitive advantage (Ochieng, 2015).

1.1.4   Jade Collections Clothing Stores, Nairobi

Established as a fashion house, the Jade Collections was established in Nairobi as a local establishment to compete with the predominant retail stores that were mainly South African. Jade was challenged to operate a purely Kenyan brand. The first shop was established in 2008 in Nairobi's central business district (CBD), initially being a family shop that offered a wide array of unique, quality as well as a fashionable and affordable outlet for children, gentlemen and ladies. The company offers a unique combination of fashions that would suit various forms of lifestyles in Kenyan urban life including work, formal and casual wear. With branches in Nairobi, Kisumu, Thika and Eldoret, Jade Collections have tried to align its operations to consumer convenience. The company's commitment to its customers has earned them regular and loyal customers within the East African region. The workforce at Jade Collections is more than two hundred and eighty members of staff (Jade Collections, 2021).

Jade Collections makes use PDA to make informed market decisions. The company collects data for analysis in three major ways. The first one is indirect tracking of customers through the use of technologies such as the IP address of various IT devices for profiling data, the company can also dig into past customer interactions at the store

and exploit the feedback thereof and data mining from various social media platforms. The data collected is then analysed through various machine learning algorithms and broken down into tidbits that are manageable and for actionable insights. Some artificial intelligence technologies can flag data anomalies or even offer suggestions to the main decision organ based on the contexualised data (Jade Collections 2021)

1.2   Research Problem

There has been a recorded rise in the use of predictive data analytics which has, in turn, resulted in firms concentrating on ways to gather information so that they can put themselves in a strategic position and gain a competitive edge. According to the McKinsey Report (2011), it is projected that businesses that will exploit the power of data analysis will increase sales by 60%. As observed by Ochieng (2015), predictive data analysis has been growing rapidly and has become an emerging technology that results in the achievement of high levels of management efficiency. In this way decisions at the organisational level are well-informed. It is noteworthy however that although there has been an emphasis on the possible gains of adoption of predictive data analysis, the implementation has still been a challenge since there is the ever-pressing need to train the required personnel, the skyrocketing cost of the tools of data analysis as well as fees accrued through service subscriptions. (Ndambo, 2016)

The onset of the Novel Covid 19 pandemic has made most customers prefer the online market to minimize contact with others (Macharia, Joseph & Okiro, 2020). This has necessitated the adoption of technologies by several SMEs including big data management and predictive data analytics. Jade Collections was not spared, in the beginning of 2021, the clothing store had branches in CBD, Mombasa Road, Eldoret, Kisumu and Thika. As of September 2021, the CEO decided to close some of these branches because the pandemic had caused profits to go down since the outfit was no longer a priority in people's needs (Jade Collections, 2021). They are currently relying majorly on online shopping by their customers. Jade Collections need a technology that can help then analyse the volume of data from the online store to understand website feedback, browsing histories, shopping habits, and customer preference and to make a better strategic decision on sales forecasting and product recommendations.

Based on a study by Kauffman (2012) that to increase competitiveness in the fashion industry, it was established that companies need to utilize a vital technology like data analysis by extracting valuable insights from existing data and applying these insights to create predictions. Ramsbothan & Kiron (2017) established those market leaders who habitually use data analysis are creating and have a higher capacity to create differentiated and innovative products when compared to organisations that are lax about such endeavours. In the Kenyan context, a study was done by Ndambo (2016) that investigated big data analysis and how it can be used to give an organization a much-needed competitive edge. This study was based on insurance and banking firms, where it was established that firms that utilize big data analysis in their day-to-day operations could rightly forecast the needs and preferences of their respective customers while at the same time gaining operational efficiency. This study was however limited in its scope relevant to the retail of clothing outlets in Nairobi, Kenya.

Based on the foregoing the use of predictive data analysis has been portrayed as an important technology that is critical in the improvement of profits in organisations. Predictive data analysis has been useful in the sale of products online and on other internet-based platforms such as social media platforms, online shops, sales reviews and reports among others. There has however been a limited empirical study on how clothes retail outlets leverage data analysis as a vital resource in the creation of competitive advantage. This projects the need for an empirical study to verify if the findings elsewhere as above, apply to retail clothing outlets in Nairobi Kenya. This study, therefore, sought to fill the gap by answering the question, does the use of predictive data analysis contribute to competitive advantage at Jade Collections retail store in Nairobi?

1.3   Research Objective

The objective of this study was to determine the extent to which the Jade Collections retailing store uses predictive data analysis to gain a competitive advantage.

1.4   Value of the study

This study is deemed beneficial to Jade Collections' top management who will use the study to understand how historical data and predictive data analysis can be exploited to gain a competitive advantage. The management will make informed decisions that would

boost sales, understand their client's purchase behaviour and formulate strategies that ensure more sales.

The study may also be beneficial to retail companies who will always benchmark themselves against other players in the industry to remain competitive. They make technological changes to their organization based on research and analysis of current market trends. These changes help them adapt to a dynamic environment and stay current with the new trends. Other clothing retail companies can benefit from this study to ensure exemplary customer experience at every interaction. The impact of Covid 19 has forced retailers to close their businesses due to the low turnout of customers (Macharia, Joseph & Okiro, 2020).

Academically, the research will provide new knowledge and guidance to future researchers who would wish to investigate further the impact of predictive data analysis on other industries. They can use the study to carry out extensive investigations by unveiling new strategies, procedures and measuring instruments: this will help reduce duplication and form a framework in which future research findings can be interpreted.

This study can be used by policymakers to get insights into emerging issues especially brought about by technology on its evolutionary path. These rapid changes have in most cases outdone the policies and statutes in e-commerce and SMEs in Kenya and around the world. This study can be used to institute a policy to protect both the consumer and the merchant from the vices of technology.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a literature review that includes a theoretical review of the theories that underpin the study. An empirical review of related studies is also done to identify research gaps and how they may be resolved by this study.

2.2 Theoretical Foundation

This study will be founded on three main theories, the Technology Acceptance Model (TAM), the Technology Organisation Environment (TOE) and Forecasting and Modeling Investments of the Investment theory.

2.2.1 Technology Acceptance Model

The Technology Acceptance Model (TAM) relates to how users of technology make decisions on whether they accept or reject a certain technological innovation. The model was founded by Davis (1989), who discovered that when the user accepts or rejects the innovation and related technologies, it will be mainly influenced by how the users perceive it as useful. As suggested by Davis (1989) perceived usefulness can refer to how the user is convinced that the technology will be important in improving their daily output. The perceived ease of use on the other hand is the level of confidence of the user on how easy it is to implement and make use of technology either as a mediator or as an actual system

Abidaje (2018) observed that the technology acceptance model may fail to apply or adopt new technologies. He views the technology acceptance model as only being acceptable for use by individuals but not institutions. This is because other institutional-based factors highly influence the adoption of new technologies.
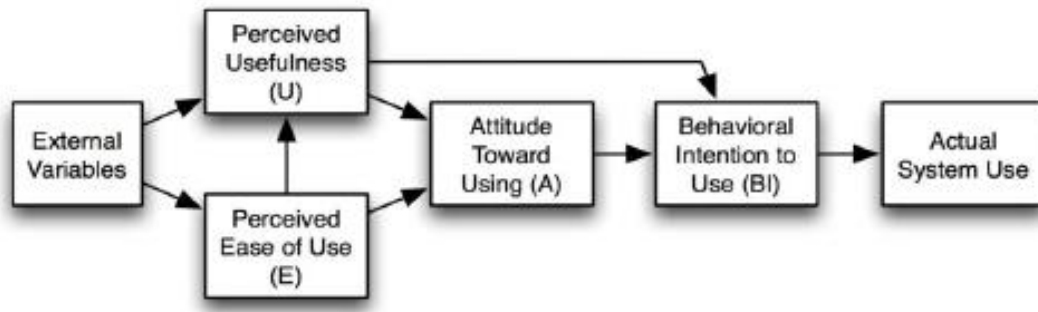
Figure 2: TAM Model; Source (Davis 1989)

The relevance of the technology acceptance model can be said to be in its ability to show retail clothing outlets the perceptions and potential effects of adopting predictive data analysis. The theory also emphasizes the reasons why specific institutions pursue various technologies based on their perceived usefulness.

2.2.2 Technology Organisation Environment

This study will also make use of technology organization and environment framework. The core constructs are adopted from three main elements, Technology, Organisation and Environment (Jere & Ngidi, 2020). This is a classical framework that is used in the prediction of an organisation's intention to adopt communication systems. Olivera & Martins (2011) asserts that the TOE model can be used in understanding the factors that influence an organisation's adoption of new technologies.

The TOE model was made in such a way that it would do an analysis of three main aspects; the Organisation, the environment and technology, based on the particular organisation's resolution to adopt new technology. In the context of the organization, the factors that were identified include formal and informal structures, structures that link and integrate functions, communication structures and processes as well as the size of the organization all of which influence the decision to adopt new technologies. In the context of the environment, the concern was based on how the organization conducts itself in a highly competitive environment and how it deals with issues of governance and regulation as well as the larger industry in general. Environment factors, in this case, include the market structure, the characteristics of the industry, technological support systems, requisite infrastructure and the regulations by various government entities. Technological context is a description of both the external and internal forces that have influenced the organisation's ability to adopt new technologies (Tomatzsky & Fleischer, 1990).

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According to Abbasi, Sarker & Chiang (2016), The TOE framework has however facilitated the assessment of only three of the various factors that can influence the organization wanting to adopt new technologies, factors such as politics, the social aspects as well as the legal part have all been overlooked. This theory is relevant to this study since it emphasizes the three main elements that influence technology adoption in a business environment, which clothing retail companies that are seeking to gain competitive advantage must consider.

2.2.3 Investment Theory

According to Butler & Kazakov (2012), the central question in the investment theory is how a robust model can be built such that it can make accurate as well as reliable stock predictions and related assets. The investment theory proposes two main forms of analysis; technical and fundamental analysis. Fundamental analysis is concerned with an organisation's statements of account including income statements and balance sheet and looks at organizational stability, and the company's competitive advantage the technical analysis will deal with the patterns within the market that can be observed and modelled according to Butler & Kazakov (2012). The theory of investment is mainly concerned with the making of decisions, especially when the management decides to satisfy particular aspirations concerning return on investment.

The main principle surrounding any form of business enterprise is the return on investment. Competitive advantage serves to reduce the risks and ensure maximum returns (Ross, 2010). For retail clothing shops to increase their sales, they need to sell quality products that have high returns. They will achieve this goal not by chance but by design.

2.3 Predictive Data Analysis and Competitive Advantage

According to Zhang (2003), while studying indexes in small and medium enterprises based on neutral networks found that there exist several methods of prediction based on the performance of firms. These prediction models include the traditional models of forecasting such as the time series and Markovian models and the modern-day techniques such as the expert system and the neural networks. Diverse methods will naturally produce diverse accuracy levels in both the long and short-term depending on how regular and available data is. Zhang's study also shows that these prediction models are

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ranked in such a way that the best models are adopted by managers to create an organisation's competitive edge. Predictive data analytics is vital to competitive advantage in that it not only uses data to improve the quality of decisions but also makes it more affordable and easier. The industry notwithstanding, the organization can utilise predictive data analytics to not only improve their functions but also their competitiveness (Lambrecht & Tucker, 2017).

Zhao (2009) has identified artificial neural networks. These are mathematical-based models that were inspired by biological network structures. According to Stergiou & Siganos (2012), artificial networks are modelled just as the biological central nervous system processes information. Such systems are made up of a large number of processing elements that are also highly interconnected. These elements work in unison to solve particular problems. According to Park (2011), the most common type of neural network is made up of at least three layers. These layers will function as an input unit to a layer of hidden units which are in turn connected to output unit layers.
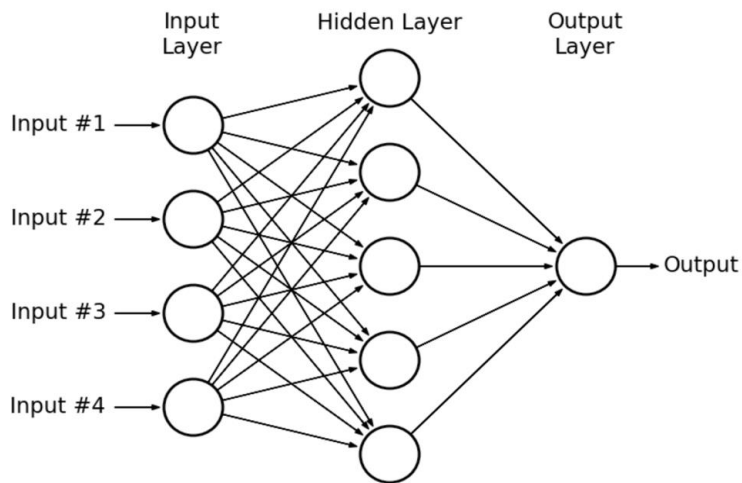
Figure 3: Neural Network Diagram; Source (Park, 2011)

Artificial Neural Networks (ANNs) are inspired by how the biological brain works (Goodfellow, Bengio & Cournville, 2016). They get configured for some particular applications and this enables machines to learn from input data (Guo et al., 2011). In this way, they can recognize patterns or classify specific data through a learning process. ANNs are usually non-linear, which makes them more accurate and practical in creating compound to complex data patterns. In many forecasting scenarios, ANNs have been

known to produce better results but only in the short run when compared to the time series model (Stergiou & Siganos, 2012). According to Zhao (2009), ANNs have been used in several disciplines including solving business-related problems and even making predictions.

A study by Kara, Boyacioglu & Baykan (2011) was in support of the assertion that ANNs posts improved forecasting accuracy on a short-term basis as suggested by Zhao (2009). Zhao further acknowledges that it is at times harder to have an important improvement in forecasting in neural networks than previously assumed. According to Kara, Boyacioglu & Baykan (2011), ANNs are more suitable for discontinuous and non-linear series that are hard to forecast using time series methods. There is very little evidence to measure how they perform in the long term. ANNs are considered important in the evaluation of how competitive an environment is. They are used in the evaluation of an organisation's competitiveness and the organization's ability to endure turbulent times and escalating competition.

Time series forecasting methods as explained by Kumar (2016) observe data that is well structured. The most basic forms of time series are random walk and mean models. Mean models are in most cases founded on the assumption that what is currently happening in the average of what has been happening until the current time. On the other hand, Random walk models are usually based on the assumption that to get a good prediction of what will happen next, we have to ignore the past and focus on what is happening currently. These two models are suggestive of the fact that there is a major change from one period to the next and therefore it is easy to determine what happens next when we know what has been happening.

The study by Kumar, (2016) on time series forecasting and modelling through the use of stochastic models indicates that they can come in several forms. Kumar points out that the two most popular models are the Autoregressive (AR) and the Moving Average (MA). Kumar advises that more accurate results can be obtained when these two models are combined. Kumar presents these two models as better suited to predict and forecast sales in the fashion industry to attain an ordered sequence of values attached to competitiveness and understand the factors that influence the current data leading to better marketing decisions.

According to Ndambo (2016) in his study on big data analysis and competitive advantage in commercial banks in Kenya, predictive data analytics is the answer for firms seeking to have a competitive edge over their competitors. The study identifies the use of cost leadership, differentiation and focus strategies. The differentiation strategy ensures competitive advantage by taking deliberate and calculated measures to ensure that your firm's products are different from those of your rivals, while the focus strategy involves the firm's focus on a particular niche of clientele. Ndambo 2016's findings indicate that strategies need to be evaluated constantly especially when firms need to stay afloat in a crowded industry. Predictive data analysis is vital in analysing the already collected data not just to understand it but also to use it to gain a competitive advantage.

Several challenges come with predictive data analysis implementation. These drawbacks will usually have a negative influence on the organisation's ability to compete (Jere & Ngidi 2020). In the Technology Organisation Environment model discussed earlier, and about the Organisation element and the perceived usability of the Technology Acceptance Model, one can see these challenges. The biggest challenge in the adoption of any technology is the ease and ability to use it. A study by Rigby & Bilodeau (2013) found that predictive data analysis may not necessarily appeal to everyone in the business enterprises, it, therefore, takes the support and effort of the organizational management to influence their work teams and align them with the business goals. Management plays a vital role in influencing whether an organization adopts a new technology or not (Sahay & Rajan, 2008). The adoption of new technology can create value in business enterprises, and an investment in predictive data analysis is one of the sources of gaining a competitive advantage (Sharma, Mithas & Kankanhalli, 2014).

According to Galletti & Papadimitriou (2013), organisations have been putting efforts into a bid to implement predictive data analysis as an organization-wide strategy. There are however several impediments to this process. A large storage space coupled with the power to process may be required to mine, and report on data and the insights that emanate from big data, therefore, requiring enterprises to invest heavily in technologies, equipment as well as human resources (He, 2014). Big data management and predictive data analysis are usually implemented by staff who are not only highly skilled but also specialized in statistical and related modelling techniques. The researchers, in this case,

cited that at times organisations may be forced to outsource this service since it has been described as a profession that has limited expertise.

2.4 Empirical Studies and Knowledge Gap

A study done by Mikalef, Pappas, Krogstie & Pavlou (2019) described predictive data analysis as a breakthrough and advancement in technology in both the academic and business environment. The study saw the need to have a wider debate on how and whether predictive data analysis can gain a firm's competitive edge. Several studies have ventured into decisions and challenges that are faced by firms in their bid to gain a competitive advantage through the utilization of predictive data analysis (Gunther, Mehrizi, Huysman & Feldberg, 2017). The study by Mikalef and Krogostie was done in large commercial enterprises.

A study by Ndambo (2016) found predictive data analytics and related solutions are usually perceived as an emerging technology and one that is growing and supports business enterprises to have a competitive edge. When allocating resources, organisations need to deliberately invest more in predictive analytics after realizing its economic value. Lee, Kweon, Kim & Chai (2017), while investigating the effects of the implementation of predictive analysis on an organisation's market value, proposed that organisations that have invested in big data analysis and related solutions have been viewed favourably by those investing in the stock markets. This study was however limited to just a small population since big data analysis is still an emerging technology that hasn't been understood by several organisations. While considering the returns on investment on specific firms, the study recommended that future studies should be more attentive to an assessment of long-term big data analysis and related adoptions (Lee et al, 2017)

A study done by Liu (2014), clearly made an illustration the importance of investing in Big Data Analysis. Liu observed that predictive data analysis under big data analysis is the core differentiator between high and low performance in business enterprises. Technology has facilitated business organisations to be very swift and proactive in the process of identifying opportunities for new businesses and to have a competitive advantage in the environment in which they operate. Liu's study also recorded that big data management and predictive data analysis significantly reduce the acquisition of clients by 48% while revenue is increased by 8%, thereby making a case for a company's

competitive advantage. This study was however based on the performance of firms and not directly linked to competitive advantage.

Arora & Rahman (2018) in their study on the relationship between big data analysis and competitive advantage observed that predictive data analysis when properly applied offers business enterprises significant opportunities to meet the needs of their clients uniquely thereby enhancing the overall performance of the organization. Arora & Rahman (2016) established that no firm can rely on data alone to gain a competitive advantage, it is rather the ability of the business enterprise to combine and integrate data from different sources to extract value from it, this is in conjunction with other complementary assets of the organization in such a way that it is aligned to the business strategy. The study, therefore, observed that predictive data analysis must be used together with other firm resources for the organization in question to gain a competitive advantage.

The same sentiments of Arora & Rahman (2018) were expressed by a study done by Lambrecht & Tucker (2017) who observed that business enterprises must compete through the use of predictive data analysis not just through utilizing the data science that includes data mining and related knowledge, but also the ability to discover patterns, sequences and series as well as having insights into raw data. The study is adamant that for a firm to build a competitive edge sustainably, it must leverage its resources that are not just unique but hard to replicate. The competitive edge is gained through experiences and learning especially through the way information is communicated in the organisation. This study by Lambretch & Tucker (2017) can be said to have been limited since it used just one case study in one industry. The researchers recommended that further studies be done to confidently generalize the findings to other industries and sectors on the exact role of predictive data analysis in the creation of competitive advantage within business enterprises. The study presents a contextual gap in that the studies were done in developed nations whose context cannot be generalized to that of SMEs in Kenya.

A study was done by Nderi (2014) on how firms make use of data analysis to create competitive advantage in Kenyan banks, the study was stressing on the particular areas in which Kenyan financial institutions apply big data analysis as well as the factors that

drive technological adoption. The study did a census of forty-four commercial banks in Nairobi and found that predictive data analysis was positively and significantly correlated to the bank's performance. The study was however limited such that it was specific to the banking industry and commercial banks, which are some of the biggest businesses in Kenya, while the retail clothing sector falls under small and medium enterprises. The findings on the bank therefore may not be generalized to clothing retail stores and other smaller industries.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This research methodology chapter discusses the research design, the data collection techniques, and the data analysis techniques used to analyze data.

3.2 Research Design

This study used a case study design. A case study is preferred since it is a research strategy where empirical investigations are utilised to understand particular phenomena within a real-life context using various sources of evidence (Robson 2003). This design was deemed useful by the researcher seeking a description of the context and processes at Jade Collections. The study aimed to get a greater understanding of the subject matter and reduce any bias, this study targeted to get an in-depth view of Jade Collections' information systems to see how predictive data analysis is applied in the clothing store. Jade Collections was selected as it offers an opportunity to view predictive data analysis use, especially in small and medium enterprises, particularly collecting data and subjecting it to statistical analysis and forms of machine learning to identify the likelihood of future outcomes founded on historical data. The research and practice gaps were the key drivers of the study.

3.3 Data Collections

The study focused on addressing the use of predictive data analysis to gain a competitive advantage. The study sought to collect data from the ICT manager and head of marketing (or equivalent). The choice of ICT manager was because predictive data analysis falls within the ICT department. The head of marketing was chosen because he utilizes predictive data analysis to make data-driven marketing decisions to create a competitive advantage.

The study collected qualitative data through in-depth interviews. Deeply considering the use and implementation of predictive data analysis, may help in understanding its benefits and its capacity and capability to give an organization a competitive edge over its competitors. The interviews were concerned with an exploration of understanding the

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data (Collis & Hussey 2014). This study used semi-structured interviews from where themes were generated from the questions, which gave the researcher more flexibility to add some questions or omit others during the interview process.

3.4 Data Analysis

The data collected in this study was qualitative, the researcher arranged the information obtained from in-depth interviews into themes which were coded appropriately. This included the identification of text as specific thematic ideas. This coding process was instrumental in the retrieval of information that was within the same thematic area. The study afterwards had descriptive summaries of the responses which, in turn, were interpreted in terms of concepts, themes, interactions, categories and processes.

CHAPTER FOUR

ANALYSIS OF STUDY FINDINGS

4.1 Introduction

Since this study focused on addressing the use of predictive data analysis to gain a competitive advantage, in-depth interviews were done at Jade Collections' information systems to see how predictive data analysis is applied in the clothing store. Two main respondents were interviewed; face to face interview was done with the head of marketing, while the ICT manager was interviewed through a phone call.

4.2 Adoption of Predictive Data Analysis at Jade Collections.

The study inquired about the adoption and acquisition of predictive data analysis at Jade Collections. The ICT manager reported that the adoption of PDA has been a journey with the rapidly changing technology, trial and error, which has seen them change from one software to another. The interviewee thus reported:

> *"Adoption and use of PDA have been a journey, we have not yet got where, we would want to be, but are on the way there, in this journey we started with mainly basic software and have been gaining complexity and diversity. We try where we can and fuse some of our applications for better results. We have made use of Microsoft Excel, Table Public BI, Apache Spark, Microsoft Power BI, Python, R. Programming, SA {predictive analytics Cloud}, Hadoop Big Data, Google fusion Tables, IBM Business Analytics and Python."*

The statement above seems to suggest that Jade Collections does not have one-inbuilt software for predictive data analysis but rather makes use of a series of synchronized applications for better results.

The evolution of predictive data analysis at Jade Collections was described to have happened in four phases, the decision phase where there was little or no data, just ideas and decisions to do sporadic market research. The next level involved the collection of

data from multiple systems and review and analyse sporadically while the third level relates to the investment in data architecture, where data from disparate systems was combined for later use, in this processes the data was cleaned while records that are in duplicate are removed. It is at this point that Jade Collections appointed a data manager for this particular role, data was still largely inaccessible and could only be availed through special requests. The fourth phase is the phase of data utilization; data can now be used to get insights into risks, and opportunities and can even be used in artificial intelligence and machine learning.

Based on the view of the research participants in this study, especially on the use of predictive data analysis, the researcher was able to come up with some thematic areas on the use of predictive data analysis from the perspective of industry practitioners. The first thematic area in the application of PDA was based on the applications (software), opportunities and importance.

"I view it as analysing data which creates possibilities for optimization of outcomes for statistical use and implementing in the business systems and processes when one seeks improvement in a specified area"

The second thematic area in the definition and use of PDA focuses on the benefits accrued therefrom including profitability and attributes, as explained by one of the heads of marketing at Jade Collections.

"Well, since I work in the fashion industry, my motive is about the accumulation of data in gigabytes and data likes. We process data and turn it into something meaningful to improve business initiatives. The ultimate goal, in this case, is how we do something better, and how much resources we save."

The marketing manager underscored the benefits of PDA; in terms of supply chain processes as well as improvement in operational efficiency and has great effects on the organisation's sustainability. It enhances a greater understanding of customer preferences and observation of market trends and helps in the creation of agile/responsive supply chains, moreover an improvement on operational efficiencies that are also maintained through transparent information.

The interviewees were asked to do identification of how best they make use of PDA. The marketing manager particularly asserted that saving on costs and profitability plays a great role in the adoption of predictive data analysis. The main drive is profitability, saving on costs, and more especially saving time on contract negotiations, as suggested by the respondents.

Jade Collections utilize PDA to make marketing decisions, and they describe it as one of the futuristic perspectives. Decision-making calls for linked knowledge which can be achieved through PDA. The marketing manager stated that one of the biggest movers is keeping Up-to-date changes as well as making timely decisions.

  "We aim to find decisions that fit particular purposes at given times and apply it in our mission"

4.3 Data-driven Decisions at Jade Collections.

The study enquired from the interviewees how Jade Collections exploit PDA to make better marketing decisions. The marketing manager reported that: Jade Collections makes use of hard data rather than observation and intuition alone. The manager further clarified that:

  "We analyse both quantitative and qualitative data, to make marketing decisions that can be described as SMART. We also exploit PDA to discontinue or discard some of the existing products, we try as much as possible to develop a partnership with other industry players to leverage data sources.

The interviewees also reported that PDA is utilised by the top management in the setting of targets, strategic planning and general administration of the apparel shop. They also make use of PDA to tell the most appropriate times to do renovations and maintenance, staffing, division of labour and various deployments.

The study established that information sharing between various players at Jade Collections has been one of the most important vital factors in attaining cost reduction and improvement of product availability. Predictive data analysis has been viewed as a tool to help in information sharing within the larger supply chain more efficiently. The ICT manager at Jade Collections clarified that their motivation to use PDA stems from

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their great capacity to process huge amounts of data, reduce information asymmetry, save time and reduce cost; He thus stated.

"The greatest drive is to help in keeping knowledge and make it possible to share in a way that we don't have to print and drop it in my email, where I can have access to various systems so that I get what I need without having to regard or interrupt anyone else. It is at this point I can recognize a need and whether this need translates into a saving of knowledge, resources and time"

At Jade Collections, as retail clothing apparel, predictive data analysis is widely used as one of the ways to get consumer views and insights. At Jade Collections the data sets collected from the customer include demographic personal information of their clientele like their name, gender, age, telephone numbers, email address, physical location, and nature of their work. This demographic information is collected using customer profile forms filled out at the branches or online customer details forms for online shoppers. Other information the stores include their purchasing patterns, their preferred clothing style and fashion trend. This data is usually utilized for pinpoint marketing and segmentation of their markets and clients. Curiously although the respondent indicated that they conform with all data protection laws, they declined to give details on how they protect their client data; sharing that information would be a breach of the confidentiality agreement they have with their service provider. In some data sets, however, the only available information is the purchases and the customer links. The most interesting aspect of the data sets at Jade Collections is that although it only contains information connected to actual sales and the various customer IDs, it covers at least five years (2017-2022). In these data sets, there were 3,756, 544 transactions recorded.

The clothing apparel uses customer churn modelling- a predictive model that predicts whether customers remain loyal or are likely to churn, meaning that they are not likely to make a purchase the following year. Jade Collections has conducted predictive experiments making use of the most active clients who have remained loyal in the last three years from 2019 to 2021. This has provided churn predictors for the year 2022. Churners are here assumed to represent nearly half the number of clients.

This study found many patterns of interest. The most interesting was that 30% of all the new customers were likely to churn each year. This level of client loyalty is relatively low. The gap left by the churn is however filled by an impressive number of new customers. The study also found that 50% of the current loyal customers were not likely to churn in the coming years. Jade Collections' technical team described their predictive models as not only precise but also sufficiently accurate although with a considerable tradeoff between recall and precision.

Moreover, other motivators came up during the interviews such as maintenance of assets, improvement of the ability to track clients, safety standards improvement, and value addition for clients. The Head of ICT and marketing manager at Jade Collections stressed how they held importantly the need to implement PDA at clothing apparels shop. They found it is important to keep up with the advancing and upcoming technology to maintain a good reputation. The marketing manager said;

> *"We sometimes use a buzz word to keep our customers encouraged and the customers would be like "Wow! they are using, predictive data analysis, then they must be great". It is the onus of a positive selling point, we can therefore update all our clients at a go and any moment, this has had a very positive influence on the profitability of the company"*

The clothing Apparel store was reported to use customer feedback for evaluation and continuous improvement of their systems, the manager thus reported that:

> *"We highly value customer feedback and use it for monitoring and evaluation and try to improve based on customer insights, our customer preferences relative to our products are also assessed through PDA. The clothing store also makes use of PDA to make decisions on promotional activities, in turn, these promotional activities are used to collect customer feedback for improvements of our systems, this will, in turn, translate to our products and services being efficient, a better reputation for the store and greater revenues"*

Jade Collections has been able to arrange products systematically, with some having combinations from customer feedback. Customers can now easily access products at the stores thus improving the customer experience which in return has given Jade Collections an upper edge of differentiation from their competitors. All this is in line with the existing literature on predictive data analytics, which states that properly tuned predictive analytics can be used to support sales, marketing, and other complex forecasts.

On a small scale though, Jade Collections also uses PDA to get a laser-like focus to answer specific questions. For example, they can "prescribe" the needs of some specific customers'; case in point, the management discussed introducing a specific kind of socks, this was driven by the customer's combinations of items when shopping, and some of the questions raised by other customers. Jade Collections, therefore, went ahead to introduce this specific item mainly for a particular target group.

4.4 Benefits accrued from the use of Predictive Data Analysis at Jade Collections
The study inquired from the interviewees about the extent to which Jade Collections has been a beneficiary of predictive data analysis. The marketing manager in particular gave some of the benefits:

"Jade Collections has opened new revenue opportunities owing to the use of PDA, our pool is now larger and so is our market, we have reached a market section inaccessible to us thereon before"

"The use of PDA has in a big way enhanced the marketing strategies at Jade Collections, it has helped us to realise more needs of our clients and improve our systems for better delivery of services. This has in turn resulted in greater customer retention as well as acquiring new customers. Predictive data analysis has also been vital in the identification of pitfalls and the risk management initiative"

The findings established that the application of PDA has a great impact on Jade Collections relative to other clothing retailers. It was evident that the firm applied technology in various dimensions. They use PDA for online marketing and advertisement, purchasing and supply chain management, enhancing clothing store security and surveillance, online payment, and research and development of clothing

products. Even more, the influence of technology identified was essential in improving the quality of clothing products offered by retailers.

The interviewees confirmed that they use PDA for customer demand forecasting which increases the profitability of the organization. The head of marketing put it thus:

> "*Demand planning can work simultaneously with production, it informs us of when we need certain garments, gifts, or foot wear, we ask clients the type of product they would need across the year, the information gathered is availed to our purchasing team and they work hand in hand with producers in the larger fashion industry, this makes Jade Collections more productive*"

PDA has tremendously revolutionized customer feedback at Jade Collections. The way customer relationship management is handled has changed significantly. The study further indicated that Jade Collections could easily conduct customer surveys and research. As a result, Jade can compute and analyze large volumes of data for better decision-making about consumers' choices, purchasing trends and spending habits. Other than customer survey benefits, PDA can as well create a smoother browsing experience and improve customer retention through personalization. This is possible with the advent of PDA and can be further advanced by artificial intelligence.

PDA has also offered great avenues for marketing and advertising at Jade Collections. Through the integration of technology PDA elements in clothing retail, customers can now acquire more valuable information about the clothes they intend to purchase. This access to information helps the customer to decide whether to purchase a product and when to do so. The use of PDA has made it possible for the store to send product recommendations, sales offers and discounts on particular products to their clients which later translates to a personalized shopping experience for each customer and increased return on investment for the store. This way the store remains more competitive in the industry.

Predictive data analytics Technology has also facilitated the acceleration of e-payments has supported e-commerce and brought significant benefits. For Jade Collections businesses, the combination of e-payments and other online tools translates to easier

access to a much wider customer base throughout the region. In turn, this has provided customers with greater convenience and choice. With the use of social media, people are connecting with brands on a personal level which in turn is affecting the clothing retail industry in many ways by providing a platform to interact with their consumers and promote their products. The relationship that social media creates between brands and consumers is essential for brands to drive sales in future. Moreover, the use of social media has dramatically increased across all demographic groups, in recent years.

Another key area where PDA has impacted Jade Collections and the larger clothing retail is the management of inventory and stores. The benefits include improved accuracy in managing inventory, reduced logistical costs, improved customer service, improved communication, and the capacity to hold more information. Furthermore, electronic data interchange enhances information flow between or among organizations in the chain, radio frequency identification which aids in real-time inventory tracking and management and electronic point-of-sale (POS) data and big data analysis help retailers to improve their supply chain accuracy and efficiency.

The findings from the study show that predictive data analysis has led to a relative advantage in the sales at Jade Collections, even when the pricing at Jade Collections is relatively higher than its competitors. This has led to cost leadership and improved profitability for Jade Collections. The data collected helps management decide when and how to introduce a new product in the market and what decisions to make on slow-moving items.

Predictive data analysis spurs competitive advantage within the industry in terms of building a cost leadership edge of an organisation over others. Cost leadership is built over some time and it involves using the most efficient, cost-effective model to ensure that the firm enjoys healthy product margins over its competitors. Jade Collections management has embraced the use of predictive data analysis by having the right infrastructure, technical skills and IT platforms to implement it. This has helped Jade Collections gain a competitive advantage over competitors by being able to act on the findings of the analysis by understanding customer shopping trends and customers as a whole. Predictive data analysis has also had a relative advantage on the sales at Jade

Collections as the management makes decisions based on the data collected and analysed and has improved the company's offer to their customers.

4. 5 Exploitation of Social Media for Predictions

The Technical team at Jade Collections were cognizant of the fact that the digital world and diverse clientele can share and express and give feedback about their experiences while shopping especially though social media. Knowledge of consumer experiences is imperative for the enhancement of products and services. Collecting feedback has been quite a challenge at Jade Collections. The traditional methods dictate that companies make use of sales forecasting to predict the potential selling of garments and other products, this helps in planning more effectively and efficiently. Jade Collections faces operational difficulties that are occasioned by uncertainties in the demand for products as well as the variety of client preferences. The traditional models of forecasting in this case which only consider the influence of promotions and marketing campaigns have failed to capture the important role played by social networking and social media. Jade Collections in particular makes use of Twitter data to improve on forecasting of sales.

The data sets used in this case were tweets gathered by Jade Collections over a specified period. The data is then preprocessed and sentiments extracted. This involves the mining of texts which are then "Cleaned". It is from these clean tweets that sentiments are extracted using the NB classifier; the results preprocessed are further stratified as Negative, Neutral or Positive. The sentiments extracted were aggregated every fortnight; the relationship between every fortnight's sentiment and the sales in the weeks that follow was correlated.

This study deduced that since 2017, the tweets classified as being positive cumulatively were 47%, while 28% were viewed as being neutral while 27% were classified as negative. This is indicative of the fact that clients have had a positive view of various brands selected. The marketing specialist at Jade Collections found a correlation between consumer tweets and sales. This is an indication that Twitter or rather social media influences sales. The interviewee reported that social media helps in the forecasting of clothing sales and that the model they used can easily integrate with all-time series

techniques of forecasting. This helps the marketing department to make complex market decision problems in the clothing and fashion industry through the use of data extracted from social media. The decision-makers can now have a better and more data-based perspective that can help in market strategy optimization.

4.6 Use of PDA in Segmentation at Jade Collections.

This study reported that through PDA Jade Collections has been able to have a better market segmentation of the clientele; as a result, it has made Jade Collections a strong attribute to compete in the industry. The interviewees described one of its target groups as being "Professionals". The interviewee also described another segment as being *"working class women aged between 24 and 60"* and another segment described as "working class men aged between 25 and 40". Furthermore, more segmentation described specific niches of clients with nearly similar expressions including "clients interested in fashion", "aspirational, curious, fashion-oriented and creative", "urban fashion"

The above segmentation points out to focus strategy, where the organisation focuses on a particular segment rather than industry-wide strategies. This can happen in a much better way through the use of predictive data analysis. The findings indicate that Jade Collections has been able to position itself a notch higher than its competitors, thus creating differentiation by introducing a variety of products as they analyse customer feedback and act on it. Customer satisfaction has improved as seen from very high ratings of the attributes. The company has also been able to arrange products systematically, with some having combinations from customer feedback. This has made it easy for customers to access products at the stores thus improving the customer experience at Jade Collections stores which in return has given the shop the upper edge of differentiation from their competitors.

The interviewees also hinted at the use of a differentiation strategy, they use a value-driven business model. The respondent said:

"Jade Collections are value-driven, although we take the price to be a very important morality that dictates you check so that you don't overprice, it is not a matter of the

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price tag…the new brands need to have a quality design with the main focus being creating value"

The products in the fashion industry are value driven and must therefore be seen to foster their unique attributes, which include their capacity to create emotional relationships. The interviewees in this study stated that:

"Our size has allowed us to make direct connections to our customers, and thereby be very close to them, this increases the level of trust between us and our clientele who share our values.

The importance of PDA stems from the fact that it can support the easier sharing of information and improve operational efficiency. Making use of PDA to improve efficiency is not necessarily pegged to evaluation but possible optimization of operational performance therefore more enhanced and informed decisions. The ICT manager thus reported that:

"We outsource satellite services such that we can tell where our goods are and possibly how long it will take to get to us; moreover, the efficiency of the services and the ability to handle the challenges identified."

The statement above may be a testament to the benefits of trackability of PDA implementation more so where real-time data is readily available. With highly dynamic technologies new opportunities have emerged, where new applications have been made in the optimization of operations such measures ensure that resources are more visible and traceable and can be provided to users on demand and when need be, take the necessary action.

Using PDA enhances performance in logistics and the display of products. The interviewees in this study, particularly the ICT manager declared that the desired level of performance may be hard or impossible to achieve without predictive data analysis. The manager at Jade Collections claimed that worthwhile performance results have been achieved through the use of PDA.

"From the perspective of the inventory the quality may be estimated to have increased by between 80 and 90%. The performance was much better, so structurally investing in data sources was worth it"

4.7 Challenges on the use of Predictive Data Analysis at Jade Collections.

This study sought to identify challenges in the implementation of PDA, the interviewees gave several challenges, the most prominent of which are captured below:

"Implementing new technology here gets massive resistance from the staff; they always have what may look like the fear of the unknown. This may have stemmed from little or no awareness of technology on the side of the staff, and honestly, they cannot be blamed, they have never been trained on it"

Other challenges identified included the costs of technology that at times becomes prohibitive, low infrastructure for technological innovations and the fact that technology for clothing apparel has been considered too complex and viewed as being irrelevant for clothing apparel shops.

The ICT manager at Jade Collections said that pressure from outside was forcing them to conform to the tenets of PDA. The respondents confirmed that while seeking to satisfy their customers is their priority, Jada Collections was always striving and devising new strategies to attract the attention of their customers.

"Customer expectations may raise the awareness of particular needs which a supplier must fulfil within the supply chain, for example, we have one customer that I have dealt with for the last three years and we have made considerable revenue from him, we however fail to meet the clients' expectations at one time, this puts us under a lot of pressure from the top management to ensure that we meet the needs of that particular client"

The interviewees raised a concern regarding demand planning that held back some of their operations, especially in logistics and transport: the interviewee thus commented:

"In demand planning, we sometimes get a few challenges, one of such with the most profound effect in my view is the fact that we at times take extremely big projects, and

the clients demand that we use our shop, transport and display equipment (a service we sometimes outsource), this is at times conflicting as we already have a contract but seems clipped not by lack of capacity to deliver but by the inability to stick to standards as demanded by clients"

The above statement indicates that the manager was concerned about process variations and demand variability concerning the resources that are required in time vehicles, equipment and staff to be in a position to maintain high standards of services. Such tasks in demand planning may include, collaboration with garment producers and fashion designers, accurate prediction of customer demand, controlling demand variability, data collection about consumer preferences in a timely and accurate manner., process variation and control of demand variability among others.

Upon inquisition on the main functions of PDA in procurement, they were quick to point to a challenge in their processes, the selection of suppliers mainly based on flexibility and price, the interviewees reported:

"Procurement has always been about selecting the best suppliers possible, at the lowest price, and in the heist quality standards, contracting price as well as ensuring you have the highest rates of flexibility."

"Teams in procurement are a nightmare, sometimes they are extremely demanding, they want the best price there is, it is not pleasant, for example, they need this morning answers to queries they sendup at the close of business yesterday."

The staff at Jade Collections expects PDA to help them more in the selection of suppliers.

The interviewees in this study affirmed that they are using or looking for ways to better use PDA in the management of their inventory. The ICT Manager thus said:

"For consistency, completeness and accuracy, one requires an accurate inventory, without which you are doomed.

The technical teams at Jade Collections believe that inventory visibility is very important for the inventory. The interviewees also listed one main challenge in inventory management to be, how accurate information is needed for the inventory to be efficient through enhancing the coordination between various departments and sharing the right information.

Another challenge identified in inventory management was in reducing free space. The manager said;

   "We have had to customize our clients because we need more space"

This statement has highlighted the fact that there exists a huge challenge in holding the cost of inventory and related processes. This implies that there is a need to free up space for inventory reduction and improve accuracy and consistence.

4.8 Implications of PDA on Jade Collections Performance.

The use of predictive data analysis has enabled Jade Collections to have a clear differentiation amongst its competitors by anticipating the customer needs and addressing them in time before the customer sees the need to switch to competitor shops thus helping them retain most of their customer base and earn new ones. They have been able to drive satisfaction amongst their customers by giving them personalized shopping experiences and thus gaining a competitive edge.

Jade Collections has the capacity and resources and willingness to implement the use of predictive data analysis. This is pegged on the fact that Jade has been able to use findings from the data analysed to improve customer experience in the branches. Another key indicator is the fact that customers do not have difficulties when making purchases at the outlets indicating a proper system on which the card operates.

The use of predictive data analysis has also enabled Jade Collections to understand its customers better thus giving them better offerings. The staff at Jade Collections admits that PDA has increased sales hence giving Jade Collections economies of scale and better margins as compared to other competitors.

4.9 Discussion of Study Findings

The study has established that Jade Collections has adopted predictive data analysis and that they have been actively using it for their business in a bid to have a competitive edge. Jade Collections uses PDA and related technologies where they make data-driven decisions. Moreover, services and products by Jade Collections are accessible through the use of PDA. The findings are in tandem with the study by Ndambo (2016) who found

that several organisations have now been adopting PDA, to make crucial marketing decisions. This study has also revealed that Jade Collections has greatly embraced predictive data analysis. If the results of this study can be generalized to other SMEs, then technology in general and predictive data analysis have greatly been embraced among small and medium enterprises in Kenya.

The study also established that various challenges have been encountered in the process of acquiring, implementing and use of predictive data analysis. The findings rhyme with those of (Ochieng, 2015) who observed that enterprises are becoming more and more aware that predictive data analysis can help them gain the competitiveness they need to make more data-driven decisions. Unfortunately, they have been fumbling with the implementation of strategies to overcome data-related challenges that range from lack of requisite skills to resistance to change and even multiple and at times incompatible sources of data. The same argument has also been fronted by Galletti & Papadimitriou (2013), who stated that organisations are putting efforts to implement PDA successfully to help in making more informed and data-driven decisions, with the process of implementation being impeded by several inter-related challenges.

The study findings are also in line with the findings of Arora & Rahma (2018) who found that predictive data analysis when well applied can give great opportunities to organisations that wish to meet the diverse needs of their clientele. The study pointed out that data on itself may not necessarily present a firm's competitive advantage, but rather the capacity to collect, combine from different sources and analyse to extract as much value from it as possible and ensure that this is complemented by the company assets in a way that it aligns to the organisation's mission, vision and strategy. The study is also aligned with (Gunther, Mehrizi Huysman and Feldberg, 2017). Their study found that data analysis can create value in business enterprises; an investment in predictive data analysis is one of the sources of gang competitive advantage.

As expressed in this study, predictive data analysis and related solutions are usually perceived as an emerging technology and one that is growing and supports business enterprises to have a competitive edge. When allocating resources, organisations need to

deliberately invest more in predictive analysis after realizing the economic value of predictive analysis. The study, therefore, agrees with Lee, Kweon, Kim and Chai (2017), who found that while investigating the effects of the implementation of predictive analysis on an organisation's market value, proposed that organisations that have invested in big data analytics and related solutions have been viewed favourably by those investing in the stock markets. This study was however limited to just a small population since big data analytics is still an emerging technology that hasn't been understood by several organisations. The study noted that it was almost impossible to gather an adequate number of announcements.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter is a presentation of the summary of the data analyzed and from the summary the conclusions and recommendations made.

5.2 Summary of Findings.

The study investigated the role of Predictive Data Analysis on the competitive advantage of Jade Collections in Nairobi County. From the study findings, Jade Collections uses predictive data analysis on a large scale, and this analysis is done at the head office and results cascaded downwards, that is to the branches through the branch managers. Key predictive data at Jade Collections are sales data. The company also collects social media data though is done on a fairly low scale. The data collected is reviewed at least fortnightly, still at the head office, by a team of analysts working in the operations department under the Head of the Consumer Department and findings are used to inform business decisions in the company like the introduction of new items, or getting rid of dead stock. It is from this analysis that Jade has been able to position itself a notch higher than its competitors, thus creating differentiation by introducing a variety of products; this is from the analysis of customer feedback and acting on it. This has driven customer satisfaction as seen from very high ratings of the attributes.

The company has also been able to arrange products systematically, with some having combinations from customer feedback. This has made it easy for customers to access products at the stores thus improving the customer shopping experience at Jade Collections stores which in turn has given the store an upper edge of differentiation from their competitors. And all this is because of predictive data analysis, where they can analyse trends and patterns.

Concerning creating cost leadership, the findings show that predictive data analysis has had a relative advantage on the sales at Jade as the management makes decisions based on the data collected and analysed and this has improved the clothing apparels understanding of customer trends and customers as a whole. This data also helps them

decide on when and how to introduce a new product and make decisions on slow-moving items. Jade Collections management is focused on embracing technology to achieve its strategic goal. Part of the technology they use is predictive data analysis and this has been made possible by the management investing in the right infrastructure, technical skills and IT platforms to implement the technology; the company finds it relatively easy to implement and use predictive data analysis when being supported by top management although they feel they have not reached the right scale yet.

5.3 Conclusion

Technology has turned around the shopping experience of consumers. As a result, Jade Collections and other similar businesses are embracing PDA and other emerging technologies as the central focus of their business operations and having a competitive edge over their customers. From placing orders, managing inventory, making selections, and receiving payments, PDA plays part in the business operations of the clothing business. Additionally, with affordable tech devices from China and India, coupled with reduced rates of internet costs, businesses are finding digital space an ideal market for their products. Significantly, generation Y and Z are tech-savvy utilization of technology in almost every aspect of their lives. It is prudent therefore to conclude that Jade Collections is utilizing technology as a source of enhancing its competitive edge, increasing its revenue streams, reaching out to new customer segments, building awareness of its brands, and doing it because the internet has taken over and hence the right thing for any business that seeks to survive in today's turbulent environment.

Competitiveness at Jade Collections and the larger clothing retail business can be examined from the dimension of cost reduction of technology, high efficiency of the business in terms of service delivery, quality products, and superior customer service and client management. From these findings, it is evident that Jade Collections has reaped big from PDA especially in the era after the Covid-19 pandemic in enhancing their overall competitiveness. From cutting on labour costs, transportation costs, and fixed expenses normally associated with physical operations among other arrangements including working remotely.

The study thus concludes that using PDA at Jade Collections is characterized by so many challenges such as; lack of trust, lack of financial capability to invest in ICT solutions, lack of legal infrastructure etc. All these make it difficult to conduct business on the internet and thus few customers endorse online businesses.

Jade Collections have traditionally been made up of clients going in to view and try on clothing to decide whether to buy or not buy. Since 2015 Jade Collections has leveraged the power of data analysis to improve the rates of customer conversion while at the same time reducing the number of items bought and returned by customers. Jade Collections rely on leveraged data analysis, predictive modelling and machine learning. Retail apparel uses historic shopping data for example to make well-informed decisions.

5.4 Recommendations

The study revealed several challenges that have stemmed out of a lack of proper understanding, especially on new and emerging Technologies, there is therefore a great need to train the staff and do so continuously at Jade Collections. Where some ICT-related services are needed urgently and there is little or no capacity or time to train, it would be easier for the company to consider outsourcing some of their ICT and related services.

Jade Collections need to channel more resources towards the utilization of technology. In their annual budget and strategic plan, the clothing retailer needs to capture all PDA and ICT plans and allocate more resources for new and advanced ICT infrastructure. There is also a need for strategic collaboration in the sector between Jade Collections and its suppliers to strengthen online supply chain management in the clothing industry. Technology is ever-evolving; therefore, continuous training of employees and clients should be made annually in the clothing retail sector.

The study suggests that the clothing apparel store should continue to utilize creative online marketing strategies to engage consumers directly and more personally with the clothing brands. Jade Collections should also keep abreast of developments in the technological front to maintain or gain a competitive advantage through the development

of its systems or to grow its customer base. Training, seminars and publication are also useful sources of information for Jade Collections.

5.5 Limitations of the Study

It should be noted that the way Jade Collections exploits data to make decisions for competitive advantage is not very specific. This may be attributed to the fact that PDA and other related technologies are relatively young at Jade Collections and other similar retail stores.

The study may also have been limited in scope and methodology; the results may not be generalized to other SMEs. An ideal study with a wider scope within the fashion industry and being quantitative may be easier to generalize findings on the industry.

5.6 Implications for Policy and Practice.

On part of the government and the Ministry of Information Technology and Communication, it should work towards lowering the cost of establishing ICT infrastructure and internet connectivity for small and medium enterprises. This could include lowering ICT application fees or subsidizing the import duties for IT-related items. Jade Collections and similar firms in the clothing retail sector need to take up insurance against risks associated with online cyber-attacks.

Stakeholders in this important industry need to work closely with insurance players in developing customized insurance products for small retailers in the clothing sector of the economy. Adequate attention should be paid to risks and security, which is a major issue why consumers shy away from using technology. Proper sensitization and training on possible system attacks and mitigation strategies against online fraudsters should be sought for online retailers.

This study is a major contribution to the effect of predictive data analysis on the creation of competitiveness among small and medium enterprises. The study has not only given empirical evidence but also gives suggestions on how predictive data analysis implementation can be positioned to have a competitive advantage. Gaining a competitive advantage is and has been a core concern for small and medium enterprises

owing to the high competition in the industry. Through the use of the study, SMEs can improve their policies, especially on the adoption of PDA and related technologies.

5.7 Suggestions for Further Research

The scope of this study was limited to Jade Collections within Nairobi County. Although the research collected qualitative data to accomplish the research problem, to have a more impartial and reliable generalization, the scope should have been widened to include other clothing apparel shops in Nairobi County, This is to allow a thorough understanding of the role if any that PDA plays in the running of these other organizations. It is therefore a recommendation that to validate these findings, a similar study needs to be done having a wider scope within the fashion industry.

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APPENDIX 1
INTERVIEW GUIDE

Respondents' Job title. ……………………………………….

a) Do you have software that Jade Collections has adopted for data analysis?

b) Does Jade Collections maintain a database of transactional data on suppliers, customers, and products?

c) Does Jade Collections make decisions based on hard data or intuition?

d) Do you use data management in making critical strategic decisions?

e) What rules of demand and supply uncertainty influenced your decision to utilise predictive data analysis?

f) What are the benefits of implementing predictive data analysis in light of competition within the retail clothing sector in Nairobi Kenya?

g) Do you make marketing promotions and advertisements at Jade Collections based on predictive data analysis?

h) How has predictive data analysis affected customer segmentation and product offering at Jade Collections?

i) How has predictive data analysis impacted your operational costs?

j) How do emerging technologies like predictive data analysis affect competition in the fashion industry?

k) Does Jade Collections utilize predictive data analysis to make decisions on new products and customer service packages?

l) Does Jade Collections use predictive data analysis to discontinue or discard some of the existing products for customers?

m) As a manager at Jade Collections, do you get in touch or have linkages with other clothing apparel and fashion outlets to leverage data sources and services?

n) How do you use the feedback you get from data accrued from predictive data analysis?

o) Is predictive data analysis used to determine when to release specific products or services on promotion?

p) What are some of the challenges that you experience in the use of predictive data analysis?