INFLUENCE OF BUSINESS INTELLIGENCE STRATEGIES ON BUSINESS GROWTH AMONG THE LARGE-SCALE SUPERMARKETS, IN NAIROBI COUNTY, KENYA

[1] Mathenge, John Ndukui, [2] Rev. Dr. Karihe N. John

[1] Master of Business Administration in Jomo Kenyatta University of Agriculture and Technology

[2] Lecturer, Jomo Kenyatta University of Agriculture and Technology

ABSTRACT

The purpose of the study was to determine the influence of business intelligence strategies on business growth among retail supermarkets in Kenya with an aim of making recommendations. The study sought to establish the influence of business analytics techniques and business analytics infrastructure on business growth among the large scale supermarkets in Kenya. To achieve this, the researcher reviewed both theoretical and empirical literature, proposed the research methodology that addressed the gaps identified in literature as well as answered the stipulated research questions. The study employed a descriptive research design. The researcher preferred this method because it allowed an in-depth study of the subject. Data was collected using self-administered questionnaires. Pilot study was carried out to establish the validity and reliability of the research instruments. The instruments were designed appropriately according to the study objectives. The data collected was analyzed by use of descriptive and inferential statistics. The study used multiple regression and correlation analysis to show the relationship between the dependent variable and the independent variables. The data generated was keyed in and analyzed by use of Statistical Package of Social Sciences (SPSS) version 27 to generate information which was presented using charts, frequencies and percentages. Business analytics technique was found to positively and significantly influence business growth among large scale supermarkets in Nairobi County. Further, business analytics infrastructure positively and significantly influences business growth among large scale supermarkets in Nairobi County. The study thus recommends supermarkets to invest in business analytic techniques which include data mining, programming, and predictive analytics. The study further recommends supermarkets to embrace business analytics infrastructure which includes tools and systems, cloud computing, and combining outsourcing and in-house.

Key Words: Business Intelligence Strategies, Business Analytics Techniques, Business Analytics Infrastructure, Business Growth, Large Scale Supermarkets

Background of the Study

A significant proportion of Kenya's domestic trade comprises wholesale and retail traders and the Kenya Vision 2030 expects the sector to provide various opportunities and contribute to Gross Domestic Product (GDP). The sectors play a key role in the growth and development of the economy due to their linkages with other sectors by providing readily available markets for products and services to consumers (National Trade Policy, 2017). Since 2000, Kenya has seen an increase in wholesalers and retailers, and expanding regional markets. Most supermarkets and hypermarkets, both local-and foreign-owned continue to dominate domestic trade in Kenya. County governments have shown interest in wholesale and retail trade to boost revenue sources and create employment. A study by KIPPRA (2019) on the County Business Environment for MSEs (CBEM) established that a regulatory framework has the potential to drive the growth of businesses.

The concept of self-regulation has been adopted in the wholesale and retail trade sector and supported by the Ministry of Industrialization, Trade, and Enterprise Development (MoITED, 2017). The rules are self-specified, self-enforced and self-regulation in whole sale and retail trade becomes a collaborative effort of the players in the sector. Currently, the sector business membership and association is regulated under the Micro and Small Enterprise Act of 2012. To strengthen the self-regulation in the sector, Competition Authority of Kenya (CAK) guided by the Competition Act 2010 gazetted the Retail Trade Code of Practice with intention to address buyer power abuse in the retail sector and enhance the sector's self-regulation (CAK, 2021). To enhance dispute settlement mechanisms within the sector, the retail code establishes a dispute settlement committee whose membership is drawn from retailers, manufacturers, suppliers' associations, county government and ministry responsible for trade.

Traditionally, more systematic marketing approaches of data collection relying on a narrow set of data such as age, income and lifestyle are increasingly being replaced by more agile Business Intelligence (BI) technology is able not only to gather larger amounts of more diverse data faster, but also generate deeper, broader and more accurate customer insights to inform marketing strategies in line with a turbulent environment (Constantiou *et al.,* 2019). It also provides predictive analysis to allow for timely and effective exploitation of emerging opportunities and avoidance of risk (Nketia, 2018). BI technology can show which outlets or regions are selling either more or less products of particular quality and categorize customers for purposes of informing promotional decisions.

If a given segment is buying more products of a specific quality, an advert can be tailored to resonate with consumers of that demographic or psychographic who are currently not shoppers (Kar, *et al*., 2018). Afterwards, the BI may be used to analyze the sales data generated by those who responded to the promotion to determine the extent of the effectiveness of the promotion. According to Aanderud *et al.,* (2017), BI is the way in which firms transform data into actions. The emphasis here is on the purpose of using BI, which is, using data as a basis for decision-making. Vercellis (2017), from a technical perspective, views BI as a set of methodologies of mathematical models and analyses that exploit available data to generate information useful for complex decision-making processes.

BI technology features database technologies like data warehousing, data marts, data lakes and sandbox for organized storage of large amounts of data in a variety of formats such as text, images, numerals, and GIS, hence the variant name Big Data for BI technology. These are used for querying and analysis; predictive analytics for forecasting; and dashboards, reports and scorecards for graphical data visualization and performance   measurement.   Latest   BI

technologies incorporate easy-to-use graphical user interphases that can be manipulated even by non-IT experts (Khan *et al.,* 2017). BI is thus anchored on statistical methods of analysis in addition to cutting-edge algorithms to yield deeper customer insight faster,   accurately and efficiently. It can categorize data and show relations between variables (Kahalekar *et al.,* 2018).

This may provide insight into market basket analysis showing what products are often bought together and in what quantities and which brand is preferred over others; and prediction of which products are more likely to be bought at a given time (Kahalekar *et al.,* 2018). The Institute for Business Intelligence (2018) describes BI as the integration of strategies, processes and techniques to generate actionable intelligence of dispersed and inhomogeneous data of an enterprise, the market or competitors. This explanation comprises the concept of integration of strategies, thus suggesting a goal-oriented approach   with the implied actions requisite for goal attainment. This demonstrates the centrality of BI to modern data-driven, decentralized, emergent approach to strategy formulation and implementation which include conceptualization of strategic thinking in a knowledge-based economy.

Statement of the Problem

A close analysis of the Competition Authority of Kenya's (CAK) 2021 shows that it intends to protect suppliers from abuse of buyer power by enhancing transparency and predictability in the retailer-supplier trade relationships. However, whether retailers and suppliers will comply with the Retail Trade Code of Practice RTCP is a matter of time. To enhance compliance, CAK has drafted model contracts for the retail sector's supply of services and goods (CAK 2021). Already, CAK has enclosed a retail supply agreement to the RTCP where retailers and suppliers must be conversant. CAK has continued to create awareness among the various stakeholders on the substance of the Retail Trade Code of Practice (RTCP). There is a need for CAK in consultations with relevant stakeholders to provide clear guidance on which conduct amounts to 'genuine commercial reasons' that would justify a retailer de-listing products. Moreover, the RTCP does not include scenarios where a retailer requires a supplier to take back products already supplied.

The major role of Business Intelligence strategies, in an enterprise is data resource utilization. Business data and data analysis process have necessitated the need for precise choices to be made and adoption of new tasks that enhance business performance. Several studies have been done internationally, Kroger, a U.S. retail chain, deployed BI technology that uses sensors and predictive analytics to feed managers real-time data predicting when and in which stores long lines will happen (Duff *et al.,* 2018). Before BI deployment, average waiting time for shoppers was four minutes, which reduced to less than thirty seconds. Similarly, a survey by Nketia, (2018) to determine the perception of benefits of BI technology at Ghana's National Identification Authority found that 60% considered facilitation of fast decision making, 48% pointed out forecasting, while 40% considered speeding data mining.

The retail business worldwide has experienced phenomenon growth, with key destinations experiencing huge gains. However, different regions have experienced varied success rates. The key aspect here is differentiation on the various brands in the market (Rubi, 2018). Locally, Gacheri, (2018) conducted a case study on the strategic business intelligence responses by Tuskys Supermarket in Nairobi and challenged retail managers to always stay alert for any possible environmental factors that may have an implication on the company's operation and formulate appropriate strategic business intelligence responses. Lagat, (2017) studied strategic responses to changes in the external environment by supermarkets in Kenya. He recommended that the supermarkets should embrace business intelligence technology in planning which enhance inclusivity. According to Ochieng (2017) a mere 20% of supermarkets engaged in database

marketing is a signal that a very low usage of cross-selling potential of BI technology was in place. This creates a gap that requires further current research on influence of business intelligence strategies on business growth among large scale supermarkets in Kenya.

Kyalo *et al.,* (2018) researched on competitive strategies and performance of family owned supermarkets in Machakos County, Kenya. The study concluded that cost leadership, differentiation and focus strategy positively influenced performance of family-based supermarkets in Machakos County. Ochieng (2017), researched on the influence of business intelligence technology on marketing strategy of large supermarkets in Nairobi. The study concluded that business intelligence has a positive impact on the marketing strategy of large supermarkets. The study concentrated on importance of the data in the supermarket warehouse, usage of customer data from supermarket website and social media and introduction of new products based on analysis of data warehouses and online sources. These studies created a gap that this study sought to examine, the influence of business intelligence strategies on business growth among large scale supermarkets in Nairobi County.

Objectives of the Study

The general objective of this study was to examine the influence of business intelligence strategies on business growth among large scale supermarkets in Nairobi County.

Specific Objectives

i.   To establish the influence of business analytics techniques on business growth among large scale supermarkets in Nairobi County.
ii. To evaluate the influence of business analytics infrastructure on business growth among large scale supermarkets in Nairobi County.

LITERATURE REVIEW

Theoretical Review
Technology Acceptance Model (TAM)

This model was developed and validated by Davis (1993), he used technology acceptance model (TAM) to explain the mechanisms that influence and shape users' acceptance of new information technology such as business analytics techniques (Minahan *et al.,* 2016). Business analytics techniques consist of useful tools for users to save money and increase organizations' effectiveness and efficiency. According to TAM, there are two specific variables that are fundamental determinants of users' attitude toward using information technology and actual use of the system: perceived usefulness and perceived ease of use relatively to new information system design features (Eadie *et al.,* 2016). If users realize that bar coding of items is quicker and efficient, then their acceptance will be more likely.

Many researchers have conducted empirical studies to examine the explanatory power of the TAM, which produced relatively consistent results on the acceptance behavior of IT end users (Aboelmaged, 2019). TAM provided an explanation of the determinants of technology acceptance that enables explanation of user behavior across a wide scope of end-user information technologies and user populations. Technology acceptance model is relevant because it explains how supermarkets are increasingly accepting and using new technologies in business analytics techniques. It is suggested that, the actual behavior of a person is determined by his behavioral intention to use, which is in turn influenced by user's attitude toward and perceived usefulness of the technology.

According to Kuria *et al.,* (2020) when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, and most notably perceived usefulness which is the degree to which a person believes that using a particular system would enhance his or her job performance. The focus of this study is on influence of business analytics techniques and business analytics infrastructure on business growth among large scale supermarkets in Nairobi County. Thus quality, integrity of the data input and generated is important based on the staff understanding the systems in place. The data can only be reliable if it is correctly input, generated and analysed so as to have the accurate conclusions. This theory supports all the specific variables because it questions the reliability of the data and the infrastructure used to manage data.

Schumpeterian Theory of Creative Destruction

The Schumpeterian Theory of Creative Destruction was developed by Joseph Schumpeter (1942). Schumpeter's thinking evolved over his lifetime to the extent that some scholars have differentiated his early thinking where innovation was largely dependent on exceptional individuals willing to take on exceptional hazards as an act of will. Schumpeter who saw innovations as perpetual gales of creative destruction that were essential forces driving growth rates in a capitalist system. That is, entrepreneurs from his later thinking that recognized the role of large corporations in organizing and supporting innovation (Gunasekaran *et al.,* 2019). Schumpeter pointed to the discontinuous and disruptive nature of technological change in capitalism that brings the inseparable combination of short-term instability and long-term growth.

The social and organization forces play key roles in cyclical process of industrial change such as business analytics infrastructure. Schumpeter argued that entrepreneurs, who could be independent inventors created the opportunity for new profits with their innovation (Angeles *et al.,* 2019). The Schumpeterian theory is relevant because new technology replaces old technology which is better because new technology is better and adds value to the user thus business analytics infrastructure keeps on evolving. From the Schumpeterian point of view, economic phenomena are not isolated and undetermined, but this is not a reason to explain the economic world through external factors.

Creative Destruction refers to the incessant endogenous mutation of the economic structure through the destruction of the old, established behavior and plans, and the creation of new ones by entrepreneurs. It is clear then that for Schumpeter growth and cycle dynamics are mutually influencing (Legrand *et al.,* 2017). Creative destruction concept is complex for instance the outcome of a liquidation process and a reallocation of productive resources during a recession, and particularly a depression phase. Both mechanisms can have rather damaging economic consequences in the short run. The Schumpeterian Theory supports innovation that is caused by the technology as it adds value to the organization. With the business technology supermarkets are able to understand the market structures and reduces time used data collection, analysis and decision making leading to customer satisfaction.

Conceptual Framework

Conceptual framework is a detailed description of the phenomenon under the study accompanied by the graphical or visual depiction of the major variable of the study (Kothari, 2017). According to Dunn (2017) conceptual framework is diagrammatical representation that shows the relationship between dependent variable and independent variables.
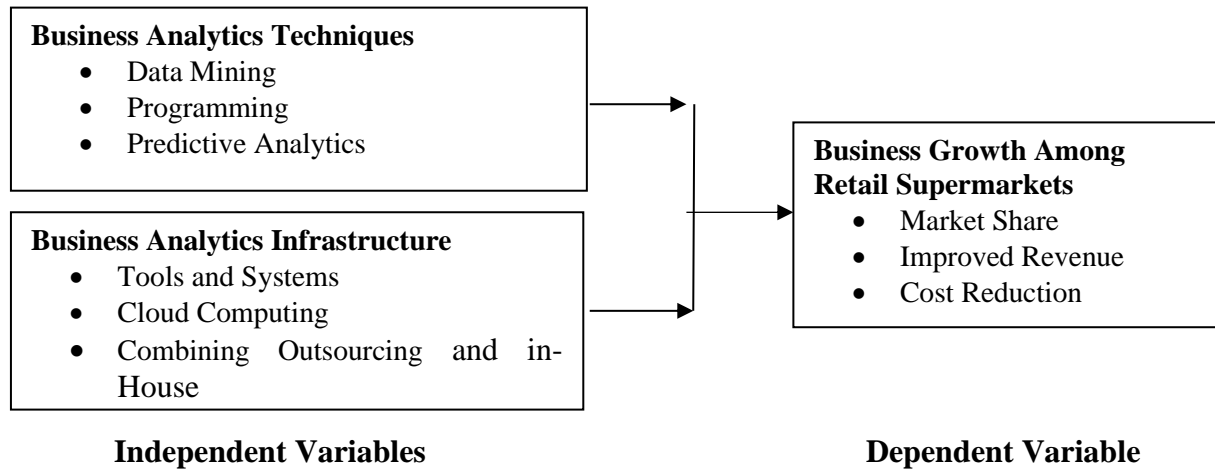
Business Analytics Techniques
- Data Mining
- Programming
- Predictive Analytics

Business Analytics Infrastructure
- Tools and Systems
- Cloud Computing
- Combining Outsourcing and in-House

Business Growth Among Retail Supermarkets
- Market Share
- Improved Revenue
- Cost Reduction

Independent Variables   **Dependent Variable**

Figure 2.1: Conceptual Framework

Business Analytics Techniques

Analytics techniques are focused on making projections about relevant events in the future. Although not known by this particular term, the discipline itself has long been used to manage supply chains. According to Ochieng (2017) analytics component of the business intelligence technology has the capacity to determine marketing strategies employed by a firm such as only targeting customers with high potential to respond. The Vendor Management Information (VMI) process is a long-standing predictive analytics approach. When regulating supply using VMI, the customer defines inventory thresholds that suppliers are not allowed to exceed or fall short of over the course of their deliveries. The customer first informs his supplier about the current inventory level and the expected gross quantities required over a defined time period. After planning the production and transport of the goods in question, the supplier then informs the customer about the planned deliveries. If he has a VMI monitor, the customer can use it to compare his demand forecast and taking into account the current stock level with the supplier's planned deliveries, including goods already in transit (Gupta *et al.,* 2016).

In cases where the defined inventory thresholds be jeopardized at any given time, the monitor dispatches a warning message to all the parties involved so that they can take action to remedy the situation. Predictive analytics and mining is all about forecasting. Whether it's the likelihood of an event happening in future, forecasting a quantifiable amount or estimating a point in time at which something might happen these are all done through predictive models. Predictive models typically utilize a variety of variable data to make the prediction. The variability of the component data will have a relationship with what it is likely to predict. These data are then compiled together into a score or prediction. In a world of uncertainty, being able to predict allows one to make better decisions. Predictive models are some of the most important utilized across a number of fields. The rapid surge in amounts of data together with a need for fact based decision-making and new technology advancement open possibilities for analytics throughout business (Ochieng, 2017).

Business Analytics Infrastructure

Organizations analytical capabilities are complemented by the information management capabilities. According to Nyabuti (2018) good analytical capabilities should be complemented by good information management capabilities to integrate, transform, extract and access data. It is also important to consider market skills. Well-designed business information (BI) dashboards incorporating reading of time-series data including data over multiple successive points in time) and featuring filters and drill down capability allows analysis (Hazen *et al.,* 2019). Just about every planning retail supermarket has the ability to determine on what happened. It's often achieved

through dashboards, reports and event management, using data analysis tools like clustering, pattern-based analysis, visualization and reporting. Most systems provide these types of descriptive analytic capabilities; however, knowing what happened is often inadequate to make adjustments that improve future performance.

These phenomena lead retail supermarket managers to be increasingly reliant on these data to gain insight into expenditures, identify trends in costs and performance and support process control, inventory monitoring, product optimization and process improvement efforts (Hazen e*t al.,* 2019). Analytic tools have allowed companies like Procter & Gamble to reduce deadhead movement especially when trucks travel empty in transportation occurring in its near chain that is inbound, outbound, raw materials, and finished product by 15% and therefore also reducing costs (McDonald, 2018). For instance Tesco, a major retail firm in the United Kingdom, has reported to have experienced considerable savings throughout time (Clark, 2018). Business Analytics is a transforming process where the collected evidence is transformed into decisions or insight. The transforming process presumably utilizes some practices and technologies, and is affected by the capability set and some cultural aspects (Nyabuti, 2018).

Business Growth Among Retail Supermarkets

Due to a major difference in customer's desire, globalization of markets, government policies and procedures, innovations among others, there has been radical changes in the retail industry. (Rubi, 2018). This has caused consistent and rapid market growth on consumer's diversity and choice and thus industry changes. Supermarkets being the major retail sellers in Kenya, they compete to win customer loyalty and reference to remain competitive. Marmouse (2017) highlighted that, organization's performance represents the manner in which the company is organized to reach its objectives and the way it manages to reach them. Over the years, retail supermarkets continue to grow and this involves change in their operations and processes. There has been tremendous growth in the number of technological devices used by retail supermarkets and communications systems.

Drivers of rapid growth of supermarkets in Kenya are changing consumer lifestyles, increased urbanization, the likelihood of having a female household member in the labor force, and the economic growth experienced through the past decade (Wanjohi *et al.,* 2019). Anticipated changes in organizational performance involve reduction in the duration taken in processing critical tasks and elimination of repetitive tasks resulting in higher productivity and efficiency as well as better and quality service delivery. Business intelligence investments enhance firm's productivity, management capabilities and comparative advantage (Griffith, 2019). Studies in the developed world have attested that given the proper infrastructure, business intelligence can be an enabler for socioeconomic development (Kamel, *et al.,* 2019).

Empirical Review
Business Analytics Techniques and Business Growth Among Retail Supermarkets

Business Analytics is the gathering, storage, statistical analysis and interpretation of large amounts of organizational data with the aim of making better decisions and improving organizational performance and gaining competitive edge (Kagechu, 2018). BA could be viewed as a system that identifies challenges and opportunities in data using analytic methods with one of the most common applications of BA being planning and forecasting. Matt (2019) indicates that data analytics are key in the data transformation process towards promoting customer experience through cohesive data management, better client profiling, and supporting analysis for making informed decisions. Borges *et al.,* (2020) found that data analytics have enabled banks to improve

client relationships, deepen sales among clients, identify client weaknesses, and help in targeting high-value accounts.

According to Kinyajui (2020) the adoption of bid data analysis enabled the firm management to design customer profiles that were more suited to customer preferences and enabled better customer service management. Big Data allows for better sharing of customer knowledge and the implementation of technology infrastructure that allows for better social customer relationship management. Sahay *et al.,* (2018) put forth the significance of business analytics techniques in a holistic way. According to them, business analytics techniques portrays a broad view of the total business as it not only exhibits detail movement of products, fund and information across all the activities being carried out at different stages of a supply chain, but also it takes into account key result indicators and analytics to understand the process for taking corrective, preventive and predictive decisions. Business intelligence tools, therefore, consolidate and organize data for better business decisions which gives an organization a competitive advantage in its operations (Kagechu, 2018).

Business analytics techniques enables the organizations to set up primary drivers for basic functioning of a supply chain which includes product and process planning, sourcing, manufacturing and forward and reverse logistics. Business analytics techniques provides a performance linked futuristic approach for improving the efficiency of a supply chain in terms of cost optimization, operational efficiency, improved relationship among the members and delivery optimization. However, the authors also opined that defining business and customer requirements vis a vis organizational issues, data extraction, integration and analysis and finally taking mutually cohesive decision across the supply chain are the three primary challenges or expectations while applying business analytics techniques (*Sahay et al.,* 2018).

Business Analytics Infrastructure and Business Growth Among Retail Supermarkets

Reddi *et al.,* (2018) contend that business analytics infrastructure reduces coordination cost and transactional risk that leads to better governance. The inter-firm coordination and collaboration with the help of business analytics infrastructure does not largely depend on the hierarchical structure and nature of relationship. Thus, unlike traditional method of coordination, investment in business analytics infrastructure always pays off (Reddi *et al.,* 2019). The importance of business analytics infrastructure in bringing transparency in operations. Thus advocated for an active involvement of the top management for strategic use of business analytics infrastructure in retail supermarkets. In order to successfully implement business analytics infrastructure for improving performance connectivity among relevant people and organizations is crucial. Data essentially is linked with the activities pertaining to retail sourcing process. After manufacturing, the product is being delivered to warehouses from where it is distributed to the retail supermarkets. Sales and distribution data contains customer information related to sales and product demand (Reddi *et al.,* 2019).

There must be collaboration among both the virtual value chain and the physical value chain for providing required value to the end customers. In order to avail the benefits out of integration and operating with transparent chains information must be accurate, precise and timely shared.

Information in the context of retail supermarkets broadly includes customer information, sales information, market and competitor information, product and service level requirement, promotion and brand information, demand forecasting, inventory, capacity utilization, process planning and control information, skill inventory, human information, sourcing and vendor information, networking information, logistics, warehouse planning, pricing and fund flow and working capital information. According to Nyabuti (2018) business intelligence can be viewed as a broad category

of software applications and tools that extract and transform data from operational source systems, facilitate data visualization and enable end users to select subsets of data based on different dimensions such as time and region.

RESEARCH METHODOLOGY

This study employed descriptive research design to examine the influence of business intelligence strategies on business growth among retail supermarkets in Kenya. Descriptive research design was used in this study to gather, summarize, present and interpret information for the purpose of clarification. The study was conducted in large scale supermarkets in Nairobi County that include; Quick Mart, Naivas, Chandarana Food Plus and Carrefour. The study targeted management staff in ICT, Procurement, Marketing and Operations, who were randomly picked from the head office being the key information handlers and decision makers.

Table 1: Target Population

Department	Population per Outlet	% of Population
Quick Mart	63	28.8
Naivas	82	37.4
Chandarana Food Plus	41	18.7
Carrefour	33	15.1
Total	**219**	**100**

Source: Cytonn (2021)

The study employed a census approach to collect data from the respondents. According to Kombo and Tromp (2019) a census is a count of all the elements in a population. When a population is sufficiently small, it is not necessary to sample (Kothari, 2017).

The sample size was determined using Yamane (1967) formula. This formula was used to obtain a representative sample of the target population. The target population was estimated at 219 employees.

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

Where n is the sample size, N is the population size, e is the level of precision. In this study e is equal to 10%. The sample size was determined as follows:

$$n = \frac{219}{1 + 219\,(0.1)^2}$$

n = 69

Department	Population	Sample	% of Population
Quick Mart	63	20	28.8
Naivas	82	26	37.4
Chandarana Food Plus	41	13	18.7
Carrefour	33	10	15.1
Total	**219**	**69**	**100**

The research is a combination of qualitative and quantitative research methods. Consequently, questionnares were the most fit choice for the undertaking of this research. The questionnaires that were used for the study comprised of open and close ended questions. Likert scale of measurement was used. For the purpose of this study, the researcher used both primary data which was collected by the use of questionnaires which had both closed and open ended questions. The questionnaire was administered through drop and pick from the respondents.

Before the actual study, it is crucial to conduct a pilot study. According to Mugenda and Mugenda (2017), 10% of the sample is sufficient for pilot test. The sample was randomly picked for the pilot test. These respondents were however not included in the main study. Trochin (2017) asserted that, the accuracy of data to be collected largely depended on the data collection instruments in terms of validity and reliability. It also helped to determine whether the method of data analysis is appropriate. 10% of the 69 units of study is 7 respondents and was sufficient to check the trend of the data before the actual data collection is done.

The collected data was first checked for completeness, comprehensibility and subjected to integrity tests. It was then coded as per variable and units of analysis and entered (Berg, 2018). This study used both descriptive and inferential statistics. Descriptive statistics such as mean, percentage and standard deviation will be used to present the various characteristics for the data sets such as biographical data (Orodho, 2018). Tables and charts were used to present the results of the study. Data was organized and interpreted on account of concurrence to objectives using assistance of the computer package, statistical package for the social sciences (SPSS) version 27 to communicate research findings.

This study used Pearson's correlation model to test direction f correlation between the dependent variable and the various independent variables. Multiple regression analysis described by the model below was used to make inference between the collective effects of all the four independent variables The coefficient of determination (R-Square) resulting from the regression equation was used to determine the goodness of fit (Ngechu, 2018). The research used a multiple regression model.

RESEARCH FINDINGS AND DISCUSSION

The selected sample size for this study was 69 management staff in ICT, Procurement, Marketing and Operations, in large scale supermarkets in Nairobi County that include; Quick Mart, Naivas, Chandarana Food Plus and Carrefour. All the selected respondents were issued with questionnaires but the researcher was able to receive back only 64 questionnaires having been dully filled. The returned questionnaires formed a response rate of 92.8%. According to Mugenda and Mugenda (2013), a response rate of 50% and above is adequate for analysis and reporting, a response rate of 60% and above is good while that of 70% and above is excellent. Based on this assertion, our response rate was considered excellent and therefore, the 64 questionnaires were used for further analysis and reporting.

Descriptive Analysis

In this section the study presents findings on Likert scale questions where respondents were asked to indicate their level of agreement with various statements that relate with the influence of business intelligence strategies on business growth among large scale supermarkets in Nairobi County. They used a 5-point Likert scale where 1-strongly disagree, 2-disagree, 3-moderate, 4-agree, 5-strongly agree. The means and standard deviations were used to interpret the findings where a mean value of 1-1.4 was strongly disagree, 1.5-2.4 disagree, 2.5-3.4 neutral, 3.5-4.4 agree and 4.5-5 strongly agree.

Business Analytics Techniques

The study sought to determine the major challenges facing the business analytics techniques strategy. Some of the challenges highlighted include: challenge is collecting real-time useful data; managing influxes of data; managing data coming from multiple sources; lack of necessary analytical skills. It was evident that dealing with data is a new challenge on the business timeline, throwing many supermarkets for a loop. Now that there's more knowledge of the powers of collected data, there's been a shift toward finding new and improved methods to collect, organize, and store it. Therefore, when supermarkets recognize issues that prevent businesses from growing and reaching their goals can help put them in the right mindset to make changes in the way they look at data, giving it the reputation it deserves.

Having identified the challenges, the study sought to establish the extent business analytics techniques are used in the outlet. Table 4.5 presents the findings.

Table 2: Extent to which Business Analytics Techniques is done in Supermarkets

Extent	Frequency	Percent
Very Great Extent	6	8.6
Great Extent	12	19.0
Moderate Extent	30	46.6
Little Extent	14	22.4
Not at All	2	3.4
Total	64	100.0

Based on the findings in Table 2, 30(46.6%) of the respondents indicated that business analytics techniques are used to a moderate extent, 14(22.4%) indicated it was used to a little extent, 12(19%) indicated it was to a great extent, 6(8.6%) to a very great extent, and 2(3.4%) did not practice it at all. These findings show that Quick Mart, Naivas, Chandarana Food Plus and Carrefour used business analytics techniques to some extent but it was yet to reach a satisfactory level. Therefore, if these supermarkets can address the challenges highlighted, then they can be in a position to improve their use and its effectiveness in driving growth.

Respondents were also asked to indicate the extent to which they agree or disagree with the statements on business analytics techniques. (Please Tick 1 for "Strongly Disagree", 2 for "Disagree", 3 for neutral", 4 for "Agree" and 5 for "Strongly Agree"). Table 4.6 presents the findings obtained.

Table 3: Descriptive Analysis for Business Analytics Techniques

	Mean	Std. Dev.
Predictive Analytics plays a significant role in expanding market share	3.994	1.476
Predictive Analytics plays a significant role in improving Improved Revenue	3.994	1.343
Programming plays a significant role in cost reduction	3.988	1.475
The Data Mining plays a significant role in expanding market share	3.961	1.476
Predictive Analytics plays a significant role in cost reduction	3.961	1.674
The Data Mining plays a significant role in improving Improved Revenue	3.955	1.546
Programming plays a significant role in expanding market share	3.856	1.525
Programming plays a significant role in improving Improved Revenue	3.836	1.426
The Data Mining plays a significant role in cost reduction	3.83	1.441
Aggregate Score	**3.931**	**1.487**

From the findings, the respondents agreed on average with the statements on business analytics techniques as shown by an aggregate mean of 3.931. The findings specifically show that the respondents agreed that predictive analytics plays a significant role in expanding market share (M= 3.994, SD= 1.476); that predictive analytics plays a significant role in improving improved revenue (M= 3.994, SD= 1.343); and that programming plays a significant role in cost reduction (M= 3.988, SD= 1.475). They also agreed that the data mining plays a significant role in expanding market share (M= 3.961, SD= 1.476); that predictive analytics plays a significant role in cost reduction (M= 3.961, SD= 1.674); and that the data mining plays a significant role in improving improved revenue (M= 3.955, SD= 1.546). Furthermore, respondents agreed that programming plays a significant role in expanding market share (M= 3.856, SD= 1.525); that programming plays a significant role in improving improved revenue (M= 3.836, SD= 1.426); and that the data mining plays a significant role in cost reduction (M= 3.83, SD= 1.441).

The study findings concurs with Kagechu (2018) that Business Analytics system help business identify challenges and opportunities in data using analytic methods with one of the most common applications of BA being planning and forecasting. It also agrees with Matt (2019) who indicated that data analytics are key in the data transformation process towards promoting customer experience through cohesive data management, better client profiling, and supporting analysis for making informed decisions. Also, Borges *et al.,* (2020) found that data analytics have enabled banks to improve client relationships, deepen sales among clients, identify client weaknesses, and help in targeting high-value accounts which supports the findings of our current study.

Business Analytics Infrastructure

The study sought to establish the major challenges facing the business analytics infrastructure in supermarket. IT challenges can hurt your company's business analytics. They explained that infrastructure restrictions like insufficient security recovery data centers or network server limitations hurting data analytics capabilities. Also, for some supermarkets, remote geographical location or expensive on-premise software licensing requirements are causing a hold up in real-time communication between team members. Another challenge is absent visualization tools; sophisticated data visualization tools are the way of the future. However, many firms and corporations are forced to rely on in-house data analysts to create their reports for them—or, worse yet, they have no way to visualize their data. They also face the challenge of lack of comprehensive integration and support

Respondents were also asked to indicate the extent to which business analytics infrastructure as improved. Table 4 presents the findings obtained.

Table 4: Extent to which Business Analytics Infrastructure has improved

Extent	Frequency	Percent
Very Great Extent	8	13.2
Great Extent	16	25.0
Moderate Extent	24	36.8
Little Extent	15	23.5
Not at All	1	1.5
Total	64	100.0

The findings show that 24(36.8%) of the respondents indicated that business analytics infrastructure has improved to a moderate extent, 16(25%) indicated great extent, 15(23.5%) indicated little extent, 8(13.2%) indicated very great extent, and 1(1.5%) indicated no improvement at all. These findings show that there were different levels of improvement in business analytics infrastructure. This could be attributed to the challenges that the respondents

indicated they faced. Therefore, if these challenges are addressed, then business analytics infrastructure can be improved further resulting to improved growth in the organization.

Respondents were further asked to indicate the extent to which they agree or disagree with the following statements on business analytics infrastructure. (Please Tick 1 for "Strongly Disagree", 2 for "Disagree", 3 for neutral", 4 for "Agree" and 5 for "Strongly Agree"). Table 5 presents the findings obtained.

Table 5: Descriptive Analysis for Business Analytics Infrastructure

	Mean	Std. Dev.
Tools and systems plays a significant role in cost reduction	4.021	1.265
Cloud computing plays a significant role in expanding market share	3.961	1.149
Tools and systems plays a significant role in expanding market share	3.955	1.199
Combining outsourcing and in-house plays a significant role in cost reduction	3.902	1.235
Combining outsourcing and in-house plays a significant role in improving Improved Revenue	3.896	1.21
Combining outsourcing and in-house plays a significant role in expanding market share	3.836	1.234
Cloud computing plays a significant role in improving Improved Revenue	3.836	1.313
Cloud computing plays a significant role in cost reduction	3.81	1.142
Tools and systems plays a significant role in improving Improved Revenue	3.803	1.248
Aggregate Score	**3.891**	**1.222**

The findings in Table 5 show that the respondents agreed on average with the statements on business analytics infrastructure as shown by an aggregate mean of 3.891. The finding specifically show that the respondents agreed that tools and systems plays a significant role in cost reduction (M= 4.021, SD= 1.265); that cloud computing plays a significant role in expanding market share (M= 3.961, SD= 1.149); and that tools and systems plays a significant role in expanding market share (M= 3.955, SD= 1.199). They also agreed that combining outsourcing and in-house plays a significant role in cost reduction (M= 3.902, SD= 1.235); that combining outsourcing and in-house plays a significant role in improving improved revenue (M= 3.896, SD= 1.21); and that combining outsourcing and in-house plays a significant role in expanding market share   (M=   3.836, SD= 1.234). In addition, respondents agreed that cloud computing plays a significant role in improving improved revenue (M= 3.836, SD= 1.313); that cloud computing plays a significant role in cost reduction (M= 3.81, SD= 1.142); and that tools and systems plays a significant role in improving improved revenue (M= 3.803, SD= 1.248).

The findings agree with those of Reddi *et al.,* (2018) who contended that business analytics infrastructure reduces coordination cost and transactional risk that leads to better governance and also brings transparency in operations. Thus in order to successfully implement business analytics infrastructure for improving performance connectivity among relevant people and organizations is crucial.

Business Growth among Retail Supermarkets

Respondents were asked to give percentage change in growth of their supermarkets over the past five years (i.e. from 2018-2022) in terms of market share, revenue, and cost reduction. Table 6 presents summary of the findings.

Table 6: Growth among Retail Supermarkets

Category	2018	2019	2020	2021	2022
Market Share, (%)	29.3	33.3	30.0	33.7	33.9
Improved Revenue, (%)	12.6	20.35	18.9	20.3	20.5
Cost Reduction, (in Million Ksh)	9.6	10.2	4.5	12.9	9.7

The findings in Table 6, there were growth in market share between 2018 and 2022. However, in 2020, the market share reduced from 33.3% in 2019 to 30% in 2020. The reduction could be attributed to economic challenges that were brought by COVID 19 pandemic. However, in 2021 when the economy started to stabilize and return to normalcy, market share grew to 33.7%. The same was observed with improved revenue; there was a growth in revenue from 12.65 in 2018 to 20.35 in 2019 which declined to 18.6% in 2020 and later increased to 20.3% in 2021. In addition, the findings also show that there was 9.6 (nillion Ksh) in cost reduction in 2018 which increased to Ksh 10.2 million. However, cost reduction in 2020 decreased significantly to Ksh. 4.2 million due to challenges relate to COVID-19. In 2021, supermarkets were able to improve their cost reduction to Ksh. 9.7 million.

According to Rubi (2018), due to a major difference in customer's desire, globalization of markets, government policies and procedures, innovations among others, there has been radical changes in the retail industry. Also, Wanjohi *et al., (*2019) explained that drivers of rapid growth of supermarkets in Kenya are changing consumer lifestyles, increased urbanization, the likelihood of having a female household member in the labor force, and the economic growth experienced through the past decade. Anticipated changes in organizational performance involve reduction in the duration taken in processing critical tasks and elimination of repetitive tasks resulting in higher productivity and efficiency as well as better and quality service delivery.

Correlational Analysis

Pearson R correlation was used to measure strength and the direction of linear relationship between variables. If the correlation values are $r = \pm0.1$ to ±0.29 then the relationship between the two variables is small, if it is $r = \pm0.3$ to ±0.49 the relationship is medium, and when $r = \pm0.5$ and above there is a strong relationship between the two variables under consideration. Table 7 presents the findings obtained.

Table 7: Correlation Results

		Business Growth	Business Analytics Techniques	Business Analytics Infrastructure
Business Growth	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	64		
Business Analytics Techniques	Pearson Correlation	.589[**]	1	
	Sig. (2-tailed)	.002		
	N	64	64	
Business Analytics Infrastructure	Pearson Correlation	.754[**]	.239	1
	Sig. (2-tailed)	.001	.247	
	N	64	64	64

The findings also show that business analytics techniques had a strong positive correlation with business growth among large scale supermarkets in Nairobi County as shown by (correlation coefficient = 0.589, p-value = 0.002). Finally, business analytics infrastructure had a positive

significant correlation with business growth among large scale supermarkets in Nairobi County as shown by (correlation coefficient = 0.754, p = 0.001).

These findings therefore suggest that business intelligence strategies (business analytics techniques and business analytics infrastructure) have significant relationship with business growth among large scale supermarkets in Nairobi County. This agrees with Davenport (2015) that business intelligence techniques has the ability to boost utilization of data by exhibiting it in standard forms, coordinating and keeping it in a data warehouse making it open for extraction of valuable and shrouded data, along these lines expanding the precision of decision making and creating an upper hand. Having established that there is significant relationship between business intelligence strategies and business growth, the study computed regression analysis to establish the influence each business intelligence strategy had on growth.

Regression Analysis

In this study, a multiple regression analysis was conducted to test the influence among predictor variables. It was used to examine the influence of business intelligence strategies on business growth among large scale supermarkets in Nairobi County. The findings were presented in three tables: model summary, ANOVA and beta coefficients

Model Summary

The model summary was used to determine the amount of variation in business growth among large scale supermarkets in Nairobi County due to changes in business analytics techniques, and business analytics infrastructure. The results were as presented in Table 8

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872[a]	.760	.755	.56707

a. Predictors: (Constant), business analytics techniques, business analytics infrastructure

From the findings in Table 8, the R square is 0.760. This implies that there was 76.0% variation in business growth among large scale supermarkets in Nairobi County attributed to changes in business analytics techniques, and business analytics infrastructure. The remaining 24% implies that there are other factors influencing business growth among large scale supermarkets in Nairobi County that were not discussed in this study. Correlation coefficient (R) shows the relationship strength between the study variables. From the findings the variables were strongly and positively related as indicated r= 0.872.

Analysis of Variance

ANOVA is used to test the significance of the model. In this study, significance of the model was tested at 95% confidence interval.

Table 9: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	21.424	4	5.356	16.656	.000[b]
	Residual	18.998	59	0.322		
	Total	40.422	63			

a. Dependent Variable: business growth

b. Predictors: (Constant), business analytics techniques, business analytics infrastructure

From the ANOVA results, the data had a significance value of 0.000 which was less than the selected significance level of 0.05. This implies that the data was suitable for making conclusions on the population under investigation. Further the f-calculated (16.656) is greater than the f-critical (2.528) from the f-distribution tables suggesting that business intelligence strategies (business analytics techniques and business analytics infrastructure) can be used to predict business growth among large scale supermarkets in Nairobi County.

Beta Coefficients

From the beta coefficients results, the regression equation model was fitted. The findings were also used to answer the research questions.

Table 10: Beta Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.466	.357		4.103	.000
Business Analytics Techniques	.384	.099	.349	3.872	.001
Business Analytics Infrastructure	.313	.109	.113	2.872	.003
a. Dependent Variable: Business Growth					

From the results in Table 10, the regression model was fitted as shown below;

$$Y = 1.466 + 0.384X_1 + 0.313X_2………………………..1.5$$

Where: X_1 is business analytics techniques; and X_2 is business analytics infrastructure

The first research question was *How do business analytics techniques influence business growth in large scale supermarkets in Nairobi County?*

The study found that business analytics techniques had a statistically significant relationship with business growth in large scale supermarkets in Nairobi County. The relationship was also positive as shown by ($\beta = 0.384$, p-value <0.05). This implies that unit increase in business analytics techniques would result to increase in business growth by 0.384 units. The results show that p-value was 0.001 which is less than the selected significance level. Therefore, the answer to the second question was that business analytics techniques positively and significantly influence business growth in large scale supermarkets in Nairobi County. The findings are in agreement with those of Xia *et al.,* (2017) that business analytics is seen as having advantages, for example, encouraging quicker and more precise reporting, and enhanced decision making, enhanced client services and expanded income.

The second research question was *How does business analytics infrastructure influence business growth in large scale supermarkets in Nairobi County?*

Business analytics infrastructure had a statistically significant relationship with business growth in large scale supermarkets in Nairobi County. The relationship was also positive as shown by ($\beta = 0.313$, p-value <0.05). This implies that unit increase in business analytics infrastructure would result to increase in business growth by 0.313 units. The p-value was 0.003 which is less than the selected significance level 0.05. Hence, the answer to the fourth research question was that business analytics infrastructure has positive and significant influence on business growth in large scale supermarkets in Nairobi County. The findings agree with McDonald (2018) that analytic

tools have allowed companies like Procter & Gamble to reduce deadhead movement especially when trucks travel empty in transportation occurring in its near chain that is inbound, outbound, raw materials, and finished product by 15% and therefore also reducing costs.

Conclusions

The study also found that business analytics techniques are statistically significant in explaining business growth among large scale supermarkets in Nairobi County. The influence was found to be positive. This means that unit increase in business analytics techniques would lead to an increase in business growth among large scale supermarkets in Nairobi County. Based on the findings, the study concluded that business analytics techniques positively and significantly influence business growth among large scale supermarkets in Nairobi County.

Finally, the study also found that business analytics infrastructure is statistically significant in explaining business growth among large scale supermarkets in Nairobi County. The influence was found to be positive. This means that unit increase in business analytics infrastructure would lead to an increase in business growth among large scale supermarkets in Nairobi County. Based on the findings, the study concluded that business analytics infrastructure positively and significantly influences business growth among large scale supermarkets in Nairobi County.

Recommendations

The study also established that business analytics techniques have positive influence on growth of businesses. The study thus recommends supermarkets to invest in business analytic techniques which include data mining, programming, and predictive analytics. There is also need for supermarkets to recognize issues that prevent their businesses from growing and reaching their goals; this can help put them in the right mindset to make changes in the way they look at data, giving it the reputation it deserves.

Business analytics infrastructure had positive influence on business growth. The study recommends supermarkets to embrace business analytics infrastructure which includes tools and systems, cloud computing, and combining outsourcing and in-house. In order to get going with big data and turn it into insights and business value, businesses should make investments in the following key infrastructure elements: data collection, data storage, data analysis, and data visualization/output.

Suggestions for Further Research

This study was limited to large supermarkets in Nairobi County; the study recommends replication in other large supermarkets in other counties such as Khetias. The study was also limited to four business intelligence strategies but they explained only 76% variation in business growth among large scale supermarkets; the study recommends a study to be conducted on other factors that can explain the remaining 24% variation in business growth among large scale supermarkets. The study was conducted in retail sector which inhibits generalization of research findings in other sectors; the study thus recommends a study to be conducted in other sectors of the economy such as manufacturing.

REFERENCES

Akaranga, E. M. (2017). *The Process and Effects of Business intelligence strategies in Kenyan Business intelligence strategies,* MBA Project; United States International University (USIU), Nairobi

Amayi, F. K. (2018). *Factors Affecting Business intelligence strategies in the Public Service*: a Case Study of the State Law Office. Eldoret: Moi University.

Balogun, M. J. (2017). *Business intelligence strategies and Agency Governance for Africa Development:* The search for common cause on Excellence in the Public Service. UNCEA, Addis Ababa.

Byaman, A. & Bell, E. (2019). *Business Research Method*, Oxford University Press, New York.

Denscombe, M. (2017). The Good Research Guide: Philadelphia: Open University press. supplier selection. *European Journal of Purchasing & Supply Management*, 8(7), 23-40

Dooren, W. (2017). *Business intelligence strategies in the Flemish business intelligence strategies*; *a supply and demand approach.* (Unpublished PhD thesis) Catholic University, Leuven

Evenett, S. J. & Hoekman, B. M., (2017). *International disciplines on government business intelligence strategies: a review of economic analyses and their implications*, Centre for Economic Policy Research

Hatry, H. (2018). *Business intelligence strategies:* Getting Results. 2nd ed. Washington, DC: The Urban Institute.

Hui, O. Normah, R. & Haron, B. (2018). Business intelligence strategies issues in Malaysia. *International journal of Business,* 5(2), 6-18

Hypko, P., Tilebein, M. & Gleich, R. (2017). "Clarifying the concept of business intelligence strategies in manufacturing industries: a research synthesis*", Journal of Service Management,* 2(1), 5-22

Kobia, M., & Mohammed, N. (2017). *Kenyan experience with business intelligence strategies*. Africa Association for Public Administration and Management, Round table Conference, Arusha, Tanzania,

Kumar, R. & Markeset, T. (2018). "Development of business intelligence strategies service strategies for the oil and gas industry: a case study", *Journal of Business & Industrial Marketing,* 22(4), 272-289.

Letangule, S. & Letting, N. (2017). Effect of business intelligence strategies on organizational performance; the case study of Kenya's ministry of education. *International Journal of Management and Business Studies,* 6(2), 3-18.

Mackie, B. (2017). *Organizational business intelligence strategies in a government context*; A literature review. Scottish government social research

Mulekye, M. (2018). Sources Of Supply Market Intelligence In Strategic Sourcing Among Supermarkets In Kenya: A Case Study Of Tuskys Supermarket.

Ngechu, M. (2018). Understanding the Research Process and Methods. *An Introduction to Research Methods*. Acts press, Nairobi

Nyabuti, R. (2018). The Impact Of Business Intelligence On Corporate Performance Management: A Study Of Equity Bank.

Nzuve, S. & Njeru, L. (2019). *Perceived factors affecting business intelligence strategies among local authorities in Kenya; A case of the City council of Nairobi.* DBA Africa management review, 3(2), 23-45

Pal, H. & Ireland, W. (2018). *Business intelligence strategies: Key Strategies and Practical guidelines,* 3rd Ed. MPG Books ltd., Bodmin, Cornwall.

Sekaran, U. & Roger, B. (2018). *Research Methods for Business,* A Skill Building Approach, John Willey & Sons Ltd

Serekan, U. (2017). Research methods for business. *A skill building approach* 4th edition. New York; John Willy and sons inc.

Tukamuhabwa, S. (2017). Antecedents and consequences on business intelligence strategies non-compliance Behavior, *Journal of Economics and Behavioral studies,* 4(1)102-124

Weele, A. J., (2017). Purchasing & Business intelligence strategies Management: *Analysis, Strategy, Planning and Practice*. 4th edition, London, Thomson Learning