ROLE OF ELECTRONIC POINT OF SALE ON SUPPLY CHAIN PERFORMANCE IN RETAIL SECTOR IN KENYA AMONG SELECTED SUPERMARKET CHAINS IN NAIROBI COUNTY

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ABSTRACT: *The retail sector is one of the most competitive industries in the market. Players in this industry are always looking for ways to gain competitive edge over their competitors. Information technology is one of the areas where competition is moving to as Retailers seeks to enhance efficiency and reduce costs. One retail area that has been revolutionised by technology is the Point of Sale. Traditionally, customers would line up at the cash counter each waiting for their turn. In the modern era, we have Electronic Point of Sale which is intelligent, adaptive and insightful giving the retailers access to important information such as inventory levels, customer behaviour in addition to providing business performance reports and analysis. The system is fast and customers no longer have to wait for long to be served. This study sought to find the role of Electronic Point of Sale on Supply Chain performance of Retail sector. The study sought to establish how various aspects of the Electronic point of sales affect the performance of the supply chain. The specific objectives of the study were; To find out the role of rapid scan systems on supply chain performance of Retail Firms, to find out the role of cloud based communication systems on supply chain performance of retail firms, to find the role of Mobile point of sale on supply chain performance of retail firms and to find out the role of EFTPOS on supply chain performance of retail firms. Supermarkets located in Nairobi, Kenya were the target population for the study. This research adopted a purposive sampling technique in selecting the sample. The study specifically involved employees from procurement, marketing, stores, Information Communication and Technology, Finance and Accounts departments. The main instrument for data collection was structured questionnaires that allow for uniformity of responses to questions. The study also utilised secondary sources of information. The data collected was analysed using SPSS version 21. Descriptive statistics such as mean, frequency distribution and percentages were used to summarise and present data. Pearson's correlations coefficients was run to examine the relationship among the independent and the dependent study variables that are set out in the objectives of the study. The review discoveries demonstrated that 73.2% of progress in Supply Chain Performance at retail division can be explained by four factors in particular rapid scan systems, cloud based communication systems, mobile point of sale and EFTPOS. Effects of rapid scan systems, cloud based communication systems, mobile point of sale and EFTPOS were found to be statistically significant with a positive effect on supply chain performance. The*

recommendations of the study are that it is study recommends that it is important that Supermarkets constantly look at ways to improve customer experience through the use of EPOS. Supermarkets should also use EPOS appropriately to reduce the long queues and also embrace and invest in the use of Rapid Scan systems, a retail technology that massively improves the speed with which items can be scanned on a retail conveyor belt. The study results make evidence of the conclusion that the relationship between EPOS and Supply Chain Performance is positive.

KEYWORDS: Perpetual inventory, Bullwhip effect, Electronic Point of Sale, Cloud-based communications and Information System

INTRODUCTION

The retail sector survives or dies on margins with managers on the ceaseless mission to grow the performance of their firms (Sharma & Chandak, 2015). Technology has been one of the major areas where intense focus has been directed in a bid to accomplish the much-sought performance in terms of increased efficiency and effectiveness. Technology has seen significant changes in ranges, for example, supply chain management, stock management, and client experience and additionally prevention of loss (Piotrowicz & Cuthbertson, 2014). One retail area that has been revolutionised by technology is the Point of Sale. Point-of-Sale refers to the physical location where customers purchase goods (Singh, 2014). Traditionally, this used to be a counter where the cash register was located with customers lining up as they waited for their turn. Customers were forced to endure long lines queues due to the slow nature of the manual register and this was so especially during holidays or peak times. Some customers would abandon the queue and leave the store without purchasing. Moreover, the long queues dissuaded customers from returning to the stores in future (Gilbertson & Lehman, 2009).

Electronic point of sale came to the aid of the retail sector improving how the sector operates. An electronic of sale is a device that retailers use to track transaction that are processed on a daily basis (Gilbertson & Lehman, 2009). The concept dates back to late 1800s when a salon owner James Ritty realised that some of his employees were pocketing cash from customers themselves. This made him come up with an idea of creating a device that would have the ability of keeping a register of the daily cash transactions of his business (DECA, 2005). He ended up with Ritty's Incorruptible cashier in 1883, which is more commonly known as the cash register. This gained wide use in retail settings due to their vintage design and astonishing attention to detail (DECA, 2005). The major upgrade came in mid 1970s when IBM manufactured manufactures the first electronic cash register. This early Electronic point of Sale (E-POS) introduced multiple cashiers to computer-based technology allowing them to print out a summary of the company's sales report.

The modern E-POS that customers are familiar is even more advanced. The system encompasses technology that is more advanced with software installed and large liquid crystal display (LCD) monitors, which allow customers to see their totals adding up. The E-POS systems are more intelligent, adaptive and insightful giving the retailers access to important information such as inventory levels, customer behaviour in addition to providing business performance reports and analysis (Parreño-Marchante *et al.* 2014).

The concept of Electronic point of sale (EPOS) has spread globally. The digital transformation of the retail industry and the fierce competition that have resulted from it have driven the major retailers into shifting their efforts to technological advancements that not only enable them meet the increasing efficiency demands of their customers but also improve their overall organisational performance (Piotrowicz & Cuthbertson, 2014). Economic events that have been experience in the past have spurred retailers into looking for opportunities to reduce costs and increase operational efficiencies by investment in Information Technology (IT) infrastructure. Electronic Point of sale is one such infrastructure, which has gained wide spread all over the world (Piotrowicz & Cuthbertson, 2014). Tesco for instance which is the largest grocery retailer in the United Kingdom (U.K) have been in the forefront in terms of innovations both at home and abroad. In 1997, the company signed a contract to replace all its electronic point of Sale terminals in the UK and Europe with PC-based systems for $60 million to be done by Siemens-Nixdorf. This showed the importance big retailers are attaching to the Electronic Point of Sales (Rese, Schreiber & Baier, 2014).

In the United States (US) retailers' adoption of the Electronic point of Sale have been promising due to realisation of the benefits it presents. The installed base of Electronic Point of sale in 2014 was estimated at 13.9 million terminals with 1.7 million of being Mobile Point of Sale. The average point of sale terminals per store was assessed at two. In terms of store organization, the supermarkets, Grocery stores, convenience stores and Gasoline stations are among the biggest adopters of Electronic Point of sale in the US (Coyle, Novack, Gibson & Bardi, 2015). Walmart is one of the biggest retailers and has adopted point of sale system, which incorporates Radio Frequency Identification (RFID). This comprises attachment of tags with electronically stored information to products. These can then be read at the till electromagnetically by document framework, which gives it an association. The Walmart Electronic point of Sale completely intertwines free market activity. With Walmart, when something is purchased, it is enlisted in the cash register, which thus is associated with the corporate buying central station (Jeffus, et al., 2015). At that point when an item is sold, usually there is one less product of the sold item on the shelf. At the point the purchasing office receives a signal that a product is sold, it promptly orders the purchase of another for replenishment. In this manner, Walmart has cut down on red tape since purchasing orders are done consequently with respect to things that are being purchased at the (Jeffus, *et al.,* 2015).

In Netherlands the retail sector is composed of 94% of small retail organisations employing around 250,000 people. Factors such globalisation, demanding consumers, increasing administrative burden as well as economic recession is forcing the retailers into seeking technology that is able to improve their performance (Lee, 2004). Electronic Point of Sale is one of the retail Information Communication technology (ICT) that the retailers have run to. This is because of its ability to track sales and identify inventory levels in real time. The increased use of this system by the retailers in Netherlands can best be explained by the high number of vendors for this system standing at not less than 150 in 2011.

In most country all over the world, electronic Point of sales is widely used and specifically with the retailing firms. Leading among the retailers adopting the EPOS system are the supermarkets and groceries. The wide use has been attributed to the speed and efficiency that come with the system. The system's ability to produce analysis reports which the company can use in decision

making is also another factor contributing to wide adoption globally. Moreover, EPOS is allowing other modern concepts such as Just-in-Time Inventory (JIT) due to its automatic reordering avenue saving on space and cost (Lwiki, *et al.,* 2013).

The retail sector in Kenya just like the rest of the world is characterised by intense competition compelling managers to strive to achieve, effectiveness, cost efficiencies and customer loyalty. As espoused by Omwansa (2013), technology is one area that retailers in Kenya are finding reprieve from while trying to create competitive advantage. Electronic Point of Sale is one of the technologies that has gained a lot of popularity in Kenya among the retailers and especially amongst supermarkets chains. This has been due to realisation of the importance of managing inventory and the concept of automatic reordering which have gained popularity.

Past research has shown positive links between automation of Inventory and performance (Samuel and Ondieki, 2014). In most retail firms in Kenya and especially the supermarket, the EPOS system relates scanning equipment with the retailer's inventory Management system. When the customer picks a product from the shelf, the barcode in the product is scanned by a reader, which recognises the product. The framework takes note of the item, tallies the cost and records the transaction making a programmed record, which makes conceivable to facilitate renewal progressively. As indicated by Janat (2009) with EPOS innovation, organizations can have the capacity to settle charges, utilize electronic printouts and shrewd sense coupons, react to on-line information and data and adopt a more client-centred strategy.

One of the key considerations by shoppers Kenya and which contribute to the choice of their retailer is the speed by which they are served. EPOS system has not only improved the speed by which customers are served but have also come with increased efficiency on the part of the retailer (Omwansa, 2013). The Kenyan retailers have also adopted the EPOS system due to its ability to provide performance reports and analysis including the fast moving and slow moving products. Pollit (2007) also offers that the Electronic Point of Sale can also provide the management of the organisation with more information on staff efficiency and productivity as well as revealing any cash discrepancies. In Kenya for instance in supermarkets, the managers determines the efficiency of their cashiers by the number of clients they serve in a day information which is provided by the Electronic Point of Sales.

Statement of the Problem

Among Kenya's the fastest growing economic sectors is the retail sector together with Wholesale, Trade and communication accounting for 27 percent of the total Output (Trading Economics, 2016). Wholesale and Retail trade is one of the pedestals of Kenya's Vision 2030 both of which are relied upon to grow substantially as the economy heads to a 10% growth rate. In 2015, Nielsen Research firm which is listed in New York Stock Exchange placed Kenya as Africa's second biggest formalised retail economy after South Africa, in a buyer report that studied five Sub-Saharan Africa economies. The report discovered that over recent years, the average estimation of buyer spending has ascended by as much as 67%, making Kenya the continent's quickest developing retail market (Situma, 2015). With expanded urbanization and continuous ascent in expendable livelihoods, formal retail activity ought to continue to extend and broaden particularly with section of global brands (Oxford Business group, 2016).

The potential of technology in increasing performance and growth in retail sector cannot be over emphasized. Various studies have been conducted both locally and globally. Lindgren (2011) found that that utilisation of ICT technologies could help a firm to achieve competitive advantage due to high speed of development, ability to visualise business performance and reduction in cost of doing business. Schniederjans and Cao (2002) on the other hand found that the goal of operational managers in achieving operational efficiency is narrowed down to application of various technologies which provides advantages such as cutting operational costs on resources usage, increasing flexibility and improving speed of service delivery.

 Abernathy et al (2000) conducted a research on Retailing and supply chains in the modern era. The research found out that that retail firms could obtain massive benefits by integrating its inventory management systems with both logistics and its upstream supply chain. This would thrust inventory system to 'in the nick of time' demand driven supply framework that implies essentially linking re-ordering to real-time electronic point-of-sale (EPOS) - record consumer demand, allow for following of orders consequently significant reductions in both retailer stock holdings and the amount of capital held up in those holdings. This is highlighted by the work of Salleh *et al.,* (2008), Information Technology Integration in Supermarket's Operation, which offers that IT speeds up replenishment.

Samuel and Ondieki (2014) contributed to literature in the adoption of technology among the retailers. In their study, Inventory Management Automation and the Performance of Supermarkets in Western Kenya, they recommended that retailers and especially supermarkets ought to automate their stock administration systems to enhance customer service delivery levels and cut down on operational expenses. Omwansa (2013) on the other hand in his study, Information and Communications Technology and Operational Efficiency in Supermarkets in Nairobi, found out that Supermarkets that have a wide array of technological application had higher operational efficiency. Kithinji (2015) challenged retailers to invest more in modern technology offering that this will lead to achievement of integration, minimisation of costs, enhance efficiency and increase sharing of information leading to improved performance.

Variations in the consumer market heavily affect the retail sector and the retailers therefore have to keep abreast of changes in the market. The new development in the retail sector is the need to better manage inventory which help the organisation achieve balance between efficiency and responsiveness. Various studies have evaluated systems available for automation of inventory. Krupp (2004) found ancient stock management systems to be too inefficient to use and recommended the use of Real time Material Resource Planning (MRP). MRP reduces the impact of forecasting errors which are a major source of problems to firm's performance. Sople, (2010) researched on Vendor Managed Inventory Systems (VMI) and offered that its principal advantage to the retailer is found the cut down in operating costs.

Most research on Information and Communication Technology (ICT) in Retail have looked at technology in general in improving efficiency and performance in the sector (Samuel and Ondieki, 2014; Omwansa, 2013; Abernathy et al. 2000; Salleh *et. al.* 2008). There is a need to go to specific technologies and find out the effect of each on performance of the retail sector. This research narrowed down to Electronic Point of Sales and its role in supply chain performance in the Retail Sector in Kenya.

Objectives of the study

The general objective of this study was to examine the role of electronic point of sale on supply chain performance in retail sector among selected supermarket chains in Nairobi County. Arising from this the specific objectives were:

a) To find out the role of rapid scan systems on supply chain performance of retail firms in Kenya
b) To determine the role of cloud based communication system on supply chain performance of retail firms in Kenya
c) To establish the role of EFTPOS on supply chain performance of retail firms in Kenya
d) To assess the role of Mobile Point of Sale on supply chain performance of retail firms in Kenya.

THEORETICAL REVIEW

Hypothetical framework alludes to a collection of interrelated ideas and hypotheses that aides the researcher in figuring out what things to gauge and the statistical relationship to evaluate. This reserch concentrated on the EPOS and supply chain performance and theories to be utilized incorporate; Transaction Cost Economics (TCE) Theory, The Resource Based View (RBV) Theory and the E -Technology Perspective Theory.

Transaction Cost Economics (TCE) Theory

The Transaction Cost Economics (TCE) hypothesis contends that the utilization of innovation will prompt reduced transaction costs related with the management of transactions (Alchian and Demsetz, 1972; Williamson, 1975) and by proficient coordination. Expressly perceiving the expenses of coordination among economic entities in business sectors, TCE affirms an organization's core duty is to efficiently coordinate transactionsas (Williamson, 1981). ICT can cut down coordination costs, and in supply chain settings,digitally enabled coordination ability can considerably enhance value-based efficiencies through expanded data sharing and correspondences capacities, bringing about enhanced performance of supply chains (Zhu and Kraemer, 2005). Besides, as contended by (Lopez, 2013), ICT assets affect on correspondence change; this incorporates inner and outer correspondence and coordination of activities and this empowers a faster and more proficient utilization of data both inside the firm and with external agents, for example, customers and suppliers.

TCE reveals insight into the part of the digitally enabled supply chain management in aggressive situations. An imperative element of an aggressive situation is the extensive competitive activities in the business sectors, for example, competitive entry, value change, provider unions, and introduction of new products (Kirk, 2010). To enhance performance or even survive in competitive markets, a firm needs to adjust its organizations to react to aggressive activities (Sambamurthy et al, 2003). As needs be, innovations that help cut down coordination costs are more profitable. Vulnerability is another component that influence performance and it is critical to discover approaches to caution against it. Supply vulnerability identifies with unpredictable occurrences that happen in the upstream sector of the supply chain. Among the causes to supply vulnerability

are deficiencies of materials and late deliveries. Unmistakably, supply vulnerability can upset manufacturing and adversely affect sales, where merchants and retailers down the chain are also affected. Electronic Point of sale assist hedge against this through automatic reordering of stock once a signal is sent.

Resource Based View (RBV) Theory

This hypothesis expresses that to change a short-run competitive advantage into a sustained advantage requires that these resources are heterogeneous in nature and not perfectly mobile. Viably this translates into valuable assets that are neither impeccably imitable nor substitutable without extraordinary exertion. In the event that these conditions hold, the bundle of assets can sustains the company's above average. Barney (1991) contends that the RBV approach has developed from a nascent, upstart point of view to a standout amongst the most prominent and effective theories for theories for describing, explaining, and predicting organizational relationships. The RBV hypothesis focuses on explaining value addition through technology (Zhu and Kraemer 2002, 2005). The RBV hypothesis attributes growth in firm performance to important resources or resource groups (Barney 1991). ICT makes an incentive to the firm indirectly as it influences different resources or procedures, which in turn prompt performance change and subsequently competitve advantage. Along these lines, researchers may find it especially helpful to utilize intermediate-level dependent variables at the business procedure, office, or venture level (Wade and Hulland 2004). In light of this rationale, the study will especially address the effect of EPOS on inventory management by concentrating on the inventory control practices; stock operations, procurement and ordering procedures, warehousing and capacity administration process, and customer relations through which such effect can be felt in the organisation. Revenue generation and cost reduction are the two noteworthy measurements of process performance improvements through technological selection in Supply Chain. Technology reception is gone for process change principally cost reduction and revenue generation (Mukhopadhyay and Kekre, 2002). Such improvements, seen from the RBV, come from resource cooperative synergy along the supply chain. Powerful SCM aims to synchronize supply, production, and conveyance (Lee, 2003). For this to happen, firms need make maximum use of Internet to create inter-firm digital avenue, facilitating real-time data sharing, and enhancing coordination of allocated resources over the supply network (Lee, 2003). EPOS facilitate this by offering performance and analysis reports which are accessible on ongoing premise.

## The E -Technology Perspective Theory

Electronic Point of of sale includes E-acquisition as the network is interlinked with the end goal that when stock falls below the minimum, a purchase order is sent to the supplier of the item through the network. E-Procurement does not have a larger definition and incorporates an extensive variety of business exercises. For instance, (Choi &Rungtusanatham, 2001) express that e-acquirement remains a first generation idea focused on buyers, which ought to advance into e sourcing and eventually into e-coordinated effort. Electronic point of sale for example works inside the purchasing organisation as well as stretches out to the suppliers. E-collaboration enables buyers and suppliers to build coordination through the web as far as inventory management, demand administration and production planning (Lee, 2003). The technology has been generally embraced by organizations with the point of enhancing performances both in inside procedures and in

25

procedures beyond their boundaries of each item where they are asked for to supply at whatever time the stock falls low through automatic replenishment (Barratt and Rosdahl, 2002). Generally organizations embrace e-procurement systems to deal with the purchase of low basic items and services (Min and Galle, 2002). This is so with EPOS where basic things are supplanted quickly they are purchased.

Conceptual Framework

This study sought to identify the effect on performance of retail firms from adoption of Electronic Point of sale which integrates inventory management. To better understand the variables involved, we use a conceptual framework that integrates both the independent and independent variables. A conceptual framework is a research tool that purposes that purposes to build up a comprehension of the factors under scrutiny. As indicated by (Atkinson, 2003) an applied structure considers the hypothetical and theoretical issues surrounding research work and frame a lucid and steady establishment that support the development and identification of existing variables.

Illustrated below is the conceptual framework for this study:
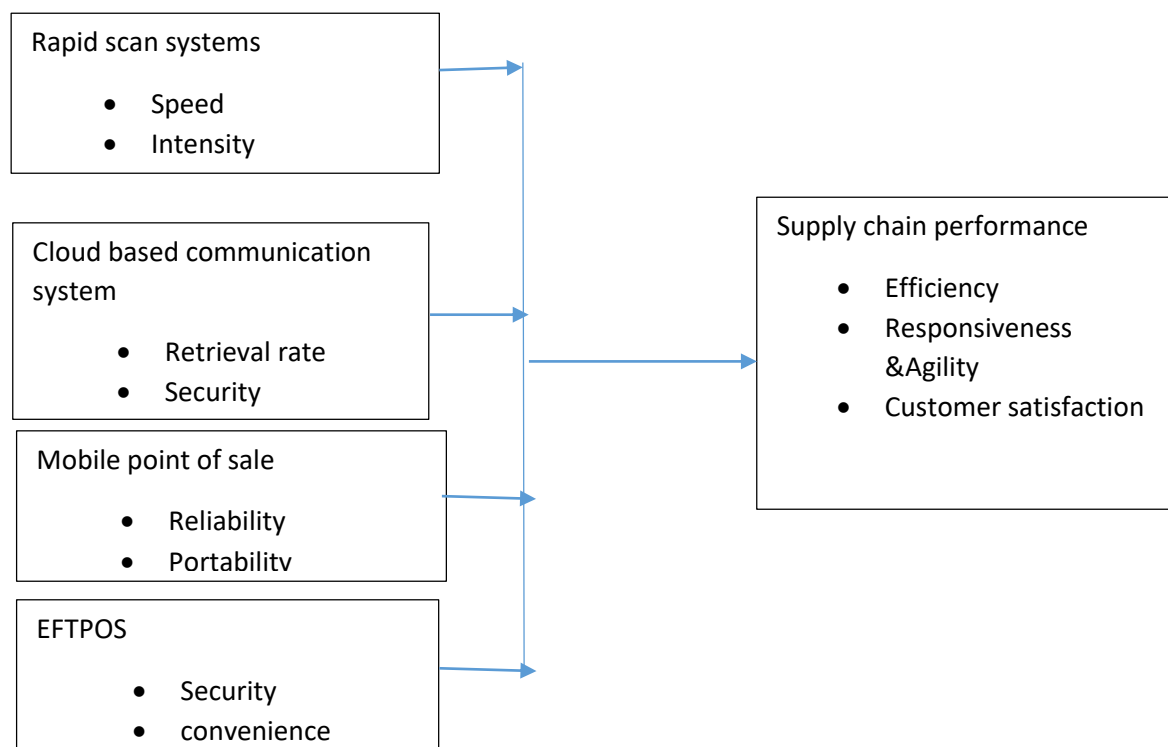
Rapid scan systems

Electronic Point-of-Sale (EPOS) scanner data furnishes category managers with a one of a kind open door for examining customer packaged products trends and patterns by information mining methods. It provides better decision making capability in the consumer packaged goods area in light of the collection of electronic scanner data during increased complex situations that occur in marketing and supply chain fields (Pepe and Pepe, 2012). EPOS data and product information such

26

as product category and price are provided to the Information System (IS) from the retailer's ERP system. At this moment, IS in the form of Automated Store Replenishment system provides the system users with information regarding out-of-shelf, out-of-shelf-duration and out-of-stock situations (Angerer, 2005). Research conducted by Wamba and Boeck (2008) has indicated that retail industry and particularly super market chains can significantly achieve benefits with the integration of RFID technology and EPOS network which will ensure timely replenishment and quicken shelf filling.

Rapid scanning involves getting to the till point and having multiple lasers scanning all customers items in seconds. That certainly beats the current self-serve option at supermarkets these days that are generally cumbersome and temperamental. The rapid scan system improves the speed with which shoppers can check out by using lasers that can record about sixty barcodes every minute. (Istook & Hwang, 2001)

Asda came up a scanning system that allows customers to scan whole week's shopping in seconds. The Rapid Scan Till designed by Wincor Nixdorf makes it faster than ever to do a weekly shop. Customers simply put their shopping on the conveyor line, watch it go through the 360° laser scanner that grabs standardized tags from each edge and after which they can pack everything up in the sacking range. It's so quick it can build the speed of examining shopping by up to 300%, and two customers can utilize it without a moment's delay (Ellram, La Londe, &Weber,2013)

Rapid Scan is a retail technology that massively improves the speed with which items can be scanned on a retail conveyor belt. Cashiers are not required to manually handle and scan items – therefore there is a time saving. The Rapid Scan solution also has a couple of limitations, in that the preferred payment process is cashless, and non-standard items, such as loose vegetables that require weighing, still require manual intervention (Istook & Hwang, 2001)

Cloud based communication

EPOS system can deliver an assortment of business analysis and performance reports. These reports extend from essential examination of everyday or yearly net revenues, to distinguishing proof of top selling items or services in an organisation's scope of items. Such information has the ability to provide a business with useful picture of their overall performance and can be of relevance when it comes to conducting marketing campaigns. An example is where the company applies discounts to less popular sales items at specific times in a year (Subramani, 2004). Moreover, the ability of EPOS systems to store information and produce reports can help a business detect where the demand on a product lies and use this information to reduce inventory especially of slow moving goods. Other form of reports that can be obtained from EPOS include vouchers and receipts which the company can send to suppliers and thus improve business reliability (Bailey and Francis, 2008).

When it comes to consumer spending habits retailers are ultimately looking for the bigger picture, which has now been conveniently wrapped up by the arrival of big data. Transactional data from banks, retailers and mobile payment apps is being pulled together and analytics software is trawling through this sea of data to deliver tangible results. These results go on to advise retail businesses of patterns that they can then base their marketing decisions on. Early initiatives have seen retailers push offers to mobile devices and bank statements.

On the delicate relationship between retailers and consumers, where retailers are seeking to understand their customers better, Dave Sheppard of Experian Footfall comments, that if customers can see an unmistakable and significant advantage from sharing their data, they will be more disposed to share a greater amount of their data all the more routinely. The advantage must be both applicable and beneficial to every customer from their point of view, and comprise of a straightforward deal to reclaim the motivating force. Retailers that secure buyers' trust by demonstrating that they care about their customers' data will be the victors, enhancing client relations and eventually brand experience (Iyer& Henderson, 2010).

Cloud communications are Internet-based voice and information correspondences where broadcast communications applications, switching and storage are facilitated by a third party outside of the association utilizing them, and they are accessed over public Internet. Cloud services is an expansive term, referring principally to data-centre-hosted services that are run and accessed over an Internet infrastructure. As of not long ago, these services have been information driven, however with the advancement of VoIP (voice over Internet convention), voice has progressed toward becoming some portion of the cloud phenomenon. Cloud communication alludes particularly to voice servicess and all the more particularly the substitution of regular business phone equipment, for example, a Private branch exchange, with third-party VoIPservice (Armbrust*et al* ,2010)

Cloud communication suppliers relay voice and data communication applications and services, hosting them on servers that the suppliers own and maintain, giving their clients access to the "cloud." Because they pay for services or applications they utilize, clients have a more cost-effective, solid and secure communications environment, without the challenges related with more traditional PBX systems. (Armbrust *et al,* 2010)

Organizations can cut expenses with cloud communication services without giving up on features. The accomplishment of Google and others as cloud-based suppliers has exhibited that a cloud-based platform can be similarly as powerful as a product based platform, however at a much lower cost. Voice services conveyed from the cloud expands the estimation of facilitated communication, as clients can similarly well turn to a cloud-based service as opposed to depending with respect to an offices based specialist organization for facilitated VoIP. This grows their options beyond local or provincial carriers. Previously, organizations have possessed the capacity to do this for IT services, yet not telecom. Cloud communication is alluring on the grounds that the cloud can now turn into a stage for voice, information and video. Most hosted services have been worked around voice, and are typically alluded to as hosted VoIP. The cloud correspondences condition fills in as a stage whereupon every one of these modes can consistently function and also intergrate (Iyer& Henderson, 2010).

Mobile point of sale

Mobile point-of-sale (mPOS) technology has taken the point of offer from the back of the store to pretty much to the extent your creative energy can take you. With Mobile point-of-sale arrangements the client can saddle the power of a PDA, tablet or other cell phone to acknowledge payments on the spot. From giving services at your clients' homes to working together at tradeshows, bug markets, sports settings or sustenance trucks and much more — with a merchant account, mobile application and suggested card reader one can swipe all real Visas and mark

platinum cards faster and effectively. While mPOS won't replace customary POS by and large, it offers advantages and opportunities to connect with your clients in new ways and make deals anyplace! (Matotek & Barnham, 2006).

Utilizing mobile POS keeps clients moving through the registration line as proficiently as conceivable notwithstanding amid deals surge times. Utilizing mPOS can also avoid back-ups at the sales registers because of returns. Enhance consumer loyalty and help prevent lost deals with mPOS solutions. Clients get disappointed when there is a question about a cost or availability of a product and a store representative doesn't have the tools to give a quick response. Giving staff cell phones linked with mPOS stock management systems to promptly help clients to get the information they have to make their purchase (Knoll, *et al* 2016).

An ever increasing number of shoppers incline toward their receipts to be emailed to eliminate paper and help them remain organized. A retail firm can give them an option with mPOS for receipts to be furnished carefully or with customary paper receipts to address your clients' issues. Keep in mind that the "m" in "mPOS" is for mobile – implying that mPOS offers you the chance to really sell anywhere. Utilizing an online connection back to the store POS and stock system, retail proprietor can develop your business by taking it anywhere its clients will be. Retail firms are no longer confined to offering in simply their physical store area. (Matotek&Barnham, 2006).

Propelled by the digital wallet and technology capabilities of near-field or beacon communication, mobile loyalty schemes are a route for retailers to enhance their virtual relationships with consumers. According to a survey by e-wallet technology provider CloudZync, shoppers access an average of six loyalty schemes through their mobile devices, compared with just four traditional loyalty cards in their wallet. Why? Digital loyalty offers real time benefits to the shopper as they enter a store, as they search and browse online or in store, and when they make a payment. Armed with a mobile device a consumer can check stock availability, compare prices, read product reviews and receive promotions (Knoll, *et al* 2016)

EFTPOS

EPOS tills enable their customers to pay for their shopping utilizing a debit or credit rather than liquid cash. The money must be taken electronically from the customer's account and paid to the store's account. This procedure of moving cash is called Electronic Funds Transfer at the Point of Sale or EFTPOS. Embedded within the credit or debit card there is a tiny electronic chip that holds the card details and the secret PIN number that only customer should be privy to. The card is inserted into a 'Chip and Pin' machine and the customer key in the PIN. At that point, a computerized request for approval is sent to the bank computer by telephone network. The banks computer establishes that there is sufficient funds in the account to complete the purchase transaction. The 'Chip and Pin' card is common in the UK, but there is a black magnetic stripe on the card as well (Abdul-Muhmin, &Alzamel, 2001)

With a specific end goal to enhance security, the bank/credit card computer additionally verifies whether the card has been accounted for as stolen. It will likewise check for abnormal spending conduct when utilizing that specific card to spot conceivable fraudsters. In the case everything is fine, a message is sent back to the EPOS unit to approve the purchase and funds are transferred from the customer's to the merchant account. (Burstein *et al* 2004)

29

Customers strongly support areas where they don't need to sit around waiting in lines. Staff placement is additionally a great deal more precise where queue management solutions are utilized, prompting significant gains in efficiency and lower costs. Irisys' real-time queue management solution is as of now proven in more than 4,000 of the world's busiest general stores. This information is utilized by retailers to drive the evaluation and management of service and productivity Key Performance Indicators.

Facilitated by Irisys' Intelligence Optimised Sensor Technology, the QM system uses discreet infrared sensors at the general stores entry and exit points, in combination with complex behavioural algorithms - based on very many customer visits - to monitor the number of customer visits and queuing behaviour, and provide important retail data.

A study of individuals' shopping habits has been recently completed and they've identified the main 10 list of the things that individuals don't like when general store shopping. These figures were taken from a survey of 2500 individuals on their grocery store shopping habits. There is no surprise on the main issue - It was long queues at the check-outs with 62% of the population surveyed expressing this to be their major issue when shopping in a supermarket. So why the general aren't stores taking care of this! Well the truth of the matter is - They are! Supermarkets are always looking into ways to enhance client encounter. The reason they look into this is on the grounds that the objective of all retailers is to enhance customer loyalty and by enhancing the customer experience will grow the customer loyalty.

In the event that a customer has a superior experience with their supermarket in comparison with a competing store e that customer will return. This will prompt increased number of store visits, more dwell time and less "relinquishment" of shopping because of hold up times. The result of all these improvement is expanded benefit for the retailer as more faithful customers spend a greater amount of their well-deserved money with their preferred retailer. General stores have along these lines been connecting with the general population counting and tracking industry and in the end we are seeing integrated solutions that look to a large portion of the measure of time clients are stood in a line amid busy shopping periods (Rosenberg& Holmes, 2002).

The line hold up time and number of individuals in the line is checked too to enable the retailer to logically screen line numbers alongside the measure of time lined and utilize this information to drive and monitor improvements. This can change staffing timetables to guarantee the right number of prepared checkout staff are nearby in synchronization with arriving client volumes. Upgrades can be a basic as moving more staff onto the check outs or to put resources into changing the kind of checkouts from customary trolley path to express checkouts. After self-checkouts were pushed out into the cold a couple of years back, not helped by discharged press articles expressing line time had really expanded at self-scan checkouts. Presently by observing the impact of the most recent self-scan check outs pilots the efficiencies of these new advances can be effortlessly demonstrated (De Francesco Jr *et al*, 2003)

Supply Chain Performance

The performance of a supply chain in the retail sector is normally evaluated by how it is able to reduce costs and increase value. For overall performance of an organisation, it is important to monitor the supply chain as it encompasses almost 75 percent of the operating budget expense

(Palevich, 1999). Performance of the supply can be determined in various ways including efficiency, responsive and speed of service delivery (Chase *et al*., 2001). Efficiency suggests minimization of aggregate system wide costs from transportation and distribution to inventories of raw materials, work in process and completed goods. To be effective, firms ought to use systems focused on making most noteworthy cost efficiency and for such efficiencies to be accomplished, non-value adding practices ought to be eliminated, economies of scale sought after and advancement methods utilized to get the best use capacity.

Responsiveness means the supply chain should be able to ensure that the customer's needs/demand are attended to without delays. For retailers to attain high levels of responsiveness, they need to be flexible to the continually changing and broad needs of their customer. Firms also need to build to order and mass customization processes as a way to meet the customers' tailor-made requirements.

Improved service speed is another measure on which the performance of retailers can be evaluated. With increasing competition in the retail sector and especially with supermarket chains, the speed at which service is delivered influences the choice the customers make on which retail store to shop from. Speed of service delivery increase the effectiveness of the retailers. Effectiveness implies making the best decision at the perfect time. Firms ought to guarantee that they do enough research to realize what their customers require and ought to likewise get the correct resources to serve their customers satisfactorily (Janat, 2009). Organizational performance can accordingly be best measured through operational cost reduction and customer service delivery levels.

With the increasing entry of international firms in the retail sector in Kenya, it is becoming more important than ever to comprehend the best cost reduction strategies, and distinguish the fundamental cost drivers in a company's operations. Technology adoption in the supply chain is no longer an option as retailers who fail to adopt the most recent technology are finding themselves in the wrong side of competition. While an undeniable requirement for cost reduction arises, actually many firms don't know where a large portion of the cost of an item occurs. It is additionally similarly essential to understand the overhead structure, as this can recognize unreasonable motivating forces that may influence later decisions (Meeker and James, 2004). (Scott and Brian, 1996) clarify that measuring consumer loyalty has turned into an undeniably vital component for successful business operation today. As per Parasuraman et. al. (1993), many retail stores conduct undercover investigations of different outlets once per year and the data is utilized by top administration to figure out which outlets require attention or even to help decide whether there is a generic problem pervading all through the organization and how such an issue may influence the services offered to the customers and general performance.

Empirical Review

Various researches have been done in the area of technology in the retail sector particularly with regard to inventory management, which is a key function of the EPOS. Wanke and Zinn (2004) studied inventory management and found that it is a key component for the reduction and control of aggregate expenses and in addition improvement of level of services given by the organizations. For Ghadge, Dani&Kalawsky (2012), the region of inventory management assumes essential part in the general cost of operations and store network of any business big or small. Han (2007) offered that inventory is utilized as a cushion against free market activity instabilities. In a similar vein,

31

for Sriram& Stump (2004), stock is a twofold edged weapon, since the lack of stock prompts loss of productivity, while overstocking prompts loss of profitability. Along these lines, (Oliveira and Rodriguez, 2008) contend that stock management has immediate and critical effects for operational efficiency (performance) and organization accounts and Ghadge, Dani&Kalawsky (2012) highlights that an effective inventory management will dependably give an upper hand to the business over its competitors.

EPOS system is normally modified to allow for information sharing with all the players in the supply chain management to allow for efficient inventory management. Various studies have been done to evaluate whether this information sharing have a positive impact on the management of inventory. Yu et al. (2001) found that Information sharing policy results in inventory reductions and cost savings. Cachon and Fisher (2000) presented a simulation-based comparative study, where the supply chain costs are 2.2% lower on average with full information sharing policy than with traditional information policy and the maximum difference is 12.1%. Also, this results in found that Information sharing policy brings about stock reductions and cost savings. Cachon and Fisher (2000) introduced a simulation based comparative review, where the supply chain costs are 2.2% lower on average with full information sharing policy than to traditional data approach and the greatest distinction is 12.1%. Likewise, this results in quicker and less expensive order processing that prompts shorter lead times. The Electronic Point of Sale (EPOS) data helps the sellers to better future orders of the retailers and lessens the bullwhip effect (Chatfield et al. 2004). The provider may exploit the retailers' inventory information in designating the stock to retailers ideally (Moinzadeh 2002).

Electronic Point of Sale data helps the organisation in the supply chain management to have Vendor Managed Inventory (VMI). VMI has been depicted as inventory and supply chain management instrument in which the provider has assumed the liability for settling on decisions on the planning and measures of stock replenishment. This tool has likewise been known as a ceaseless replenishment process, consistent re-stocking or automated replenishment (Blatherwick, 1998). The upsides of utilizing VMI to the downstream part, more often than not an extensive retailer, have well been reported (Cahon and Fisher, 1997). Waller and Mentzer (2004) noted that the principle advantages of VMI were reduced expenses, and increased customer service levels to either of the participating members. Centinkaya and Lee (2000) found that VMI significantly cut down on inventory carrying costs and stock issues while, in the meantime, it offered the ability to synchronize both stock and transportation decisions. Southard & Swenseth, (2008) noted that VMI's advantages included enhanced customer service, reduced uncertainty in the re-ordering process, reduced stock prerequisites and reduced cost in view of a contextual investigation at Johnson and Johnson.

The VMI using the data from the EPOS also enables the suppliers what's more, manufacturers to choose how much and when to deliver while taking into consideration all the information concerning diverse supply network members. This was upheld by the review directed by Danese (2007) in US retail outlets. The examination found that such a system supports the production planning and order cycle processes within the supply network on two levels. Initially in light of the business estimates of the appropriation focuses including a horizon for a year and a half; and the second in view of the suppliers/manufacturers plants decisions concerning the order confirmation inside the frozen period, considering conceivable sudden prerequisites (Ramanathan,

32

2012). A review by Marketing Research International (2009) found that effective integration of information communication technology with stock capacities utilizing stock management frameworks, for example, Electronic Data Interchange and Material Requirement Planning Systems could play a noteworthy impact in supporting successful usage of VMI practice in numerous retail outlets. Monetary request amount is the ideal size of the request that limits the cost of requesting and holding cost.

EPOS systems provide the retail organisation with information it needs to make decisions. Researchers have asserted the importance of information to any business enterprise. Loughrim (2008) state that data is the life blood of all associations. Stock director needs information technology with a specific end goal to prevail in his work. Different computer systems including EPOS examine help stock control in computing the ideal measure of stocks to hold and dispatch keeping in mind the end goal to fulfill the clients prerequisites. EPOS system can do this by contrasting stock factors (stock levels, request and conveyance dates). This can then be associated with Electronic Data Interchange (EDI). EDI is a framework which empowers coordinate correspondence between associations without there being any human intercession. This innovation has altered stock administration. EDI is the name given to the transmission and receipt of organized information by the PC frameworks of exchanging accomplices, regularly without human mediation. The worldwide Data exchange affiliation characterizes EDI as "the exchange of organized information, by concurred message gauges starting with one PC framework then onto the next, by electronic means (Agus& Noor, 2006). With the EDI system connecting the purchasing organization with its suppliers the renewal can be activated at the moment the need emerges and the message is exchanged from the first goal without further probability of debasement on the way. An EDI link enables the computer of the supplier and customers to cross examine each other about stock levels, production plans and comparable data with the goal that exercises are fittingly synchronized. This acquires potential advantages type of lessened printed material, more noteworthy precision of data, diminished staff costs and shorter lead times emerging from instantaneous communication.

The purpose of EPOS is to output and capture data identifying with products sold. An EPOS system confirms checks and gives instant sales reports, charges transactions and conveys intra-and between stores messages. The EPOS technology permits considerable cost savings and gives "real-time" information on store activity, and popularity and profitability of each line conveyed. It allows for stock to be restricted to demand, reduces the danger of obsolescence and decay of stocks, reduced odds of theft and gives information to buyers. This prompts enhanced customer service and consequently strong financial performance (Lysons and Gillingham, 2003). EPOS is typically incorporated with bar coding, which is an innovation that is utilized in numbering raw materials and completed products stock. It gives the level of inventories, facilitates faster data entry with more noteworthy exactness. Its advantages include reduced work costs through efficiency and productivity. It additionally facilitates more prominent responsiveness to customers and suppliers.

RESEARCH METHODOLOGY

In the study, cross sectional survey research design was used as it is appropriate where the overall aim is to establish whether significant associations among variables exist at some point in time. This design served well in the study as it offered a framework to explore and describe the issues

in EPOS. Using this design, the researcher was able to gain background information and clarify the stated problems. Importantly, the design guided the study to develop answers to the research questions in the aspiration to meet the objectives of the study. The population in this study consisted of 156 supermarkets, that is, all the supermarkets within Nairobi County. Since comprehensive list of supermarkets in Nairobi did not exist details were compiled from Yellow Pages of Official Kenya Directories, Nairobi Edition (2015).

The study employed purposive sampling technique by using a sample comprising of all 7 multi-tier supermarkets to select a representation of the sample frame in terms of critical factor-supermarkets with at least five branches (that' is, retail chain) - as a basis for sampling. The primary reason why the sample was strictly limited to these supermarkets is because they were perceived to be well organized, structured and innovative and getting information from them was easier.

In each supermarket headquarter five employees specifically those working in Procurement section, Stores &inventory management section, Finance and Accounts, Information Technology departments and marketing section were targeted totalling to 35 respondents. This is because these are the employees that are directly involved with the functioning of the EPOS system.

In this research, both qualitative and quantitative data were used. The data collection was majorly done by use of a questionnaire which composed of both structured and unstructured questions. The questionnaire was structured with likert scale to quantify the responses. The rational for using questionnaires is that each respondent was asked the same set of questions that provide an efficient way of collecting responses from a large sample prior to analysis. (Saunders, et al 2015). With questionnaires, one is able to obtain a lot of information in a short period. A uniform questionnaire was used in data collection. The questionnaire was self-administered but the respondents were allowed to seek clarifications when necessary. Each of the 35 respondents was given a questionnaire. The respondents were then given a chance to fill in the questionnaires at their own time. The questionnaires were hand-delivered and collected a few days later. The respondents were given the contact details of the researcher for purposes of clarifications. For this study, pilot study was undertaken in supermarkets in Kiambu County to ensure that the participating employees didn't form part of the final respondents. The pilot was done with different respondents to eliminate bias if the questionnaires qualified for use in the actual study following validity and reliability tests. To test the validity and reliability of the questionnaires a pilot study was conducted. This involved sending questionnaire samples to a panel of experts. The experts filled the questionnaires and noted the inconsistencies, which they communicated to the researcher. The questionnaire was then restructured to do away with ambiguities and inconsistencies that were realized.

The data collected from the field by use of questionnaires was assessed and comparison made so as to select the most accurate and quality without inconsistencies. The data was then coded using numbers in an excel sheet in order to categorise them in few category. The data was analysed using SPSS version 21. Descriptive statistics such as mean, standard deviation, frequency distribution and percentages were used to summarise and present data. .

Pearson's correlations coefficients was run to examine the relationship among the independent and the dependent study variables that are set out in the objectives of the study. The regression model is as below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where

Y = Supply chain performance of retail firms

β_0 =Constant

X_1 =Rapid scan systems

X_2 =Cloud based communication

X_3 =Mobile point of sale

X_4 =EFTPOS

$\beta_1, \beta_2, \beta_3, \beta_4$ Are regression coefficients and ε is the error term.

DATA ANALYSIS AND INTERPRETATION

The study sought to investigate the role of electronic point of sale on supply chain performance in the retail sector targeting supermarkets in Nairobi County. Specifically the study looked at rapid scan systems, cloud based communication systems, Electronic Fund Transfer Point of Sale and Mobile Point of Sale. Data collected was mainly ordinal in nature which captured the perception of the respondents in a five level semantic differential questionnaire with 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Large extent and 5-Very large extent. Data was analysed, results interpreted on the basis of the overall objectives of the study.

The researcher targeted 35 respondents from 7 multi-tier supermarkets to select a representation of the sample frame in terms of critical factor- supermarkets with at least five branches (that is, retail chain) - as a basis for sampling. The primary reason why the researcher targeted these supermarkets is because they are perceived to be well organized, structured and innovative and getting information from them will be easier. However, 29 questionnaires were filled correctly and returned. This translates to 82.86%. This exemplary response rate was made a reality after the analyst made individual visits to remind the respondents to fill-in and give back the polls. This reaction rate was great and delegate and fits in with Mugenda and Mugenda (2003) stipulation that a reaction rate of half is satisfactory for investigation and revealing; a rate of 60% is great and a reaction rate of 70% and over is magnificent.

Table 4. 1: Response Rate

Category	Frequency	Percent
Response	29	82.86
Non response	6	17.14
Total	35	100.0

Reliability and validity Test

An instruments degree of reliability is measured by an instruments consistent yield of results after conducting numerous trial (Mugenda & Mugenda, 2003). During the pilot study, two repeat mailings of the instrument were done to enhance the general response rate before sending the real instrument to take into consideration pre-testing of the exploration instrument. Cronbach's Alpha for each esteem was built up by the SPSS application and gaged against each other at a cut off estimation of 0.7 which is worthy as per Cooper and Schindler (2008). Cronbach's alpha estimations of 0.7 or more is viewed as satisfactory, the normal Cronbach's Alpha esteem was 0.899as shown in Table 4.2 below meaning the items under each variable were consistent.

Table 4. 2: Reliability test

Variable	Cronbach's Alpha	No of Items
Rapid scan systems	.916	8
Cloud based communication systems	.895	7
EFTPOS	.860	6
Mobile point of sale	.928	6
Supply chain performance		
	.896	8
Average Cronbach's Alpha	.899	35

Demographic Characteristics of the respondents

This analyses the background information of the respondents from their gender, age, level of management, duration in the company and the respondents' highest level of education. In this study the background information was based on the respondents' distribution as per their functional level departments.
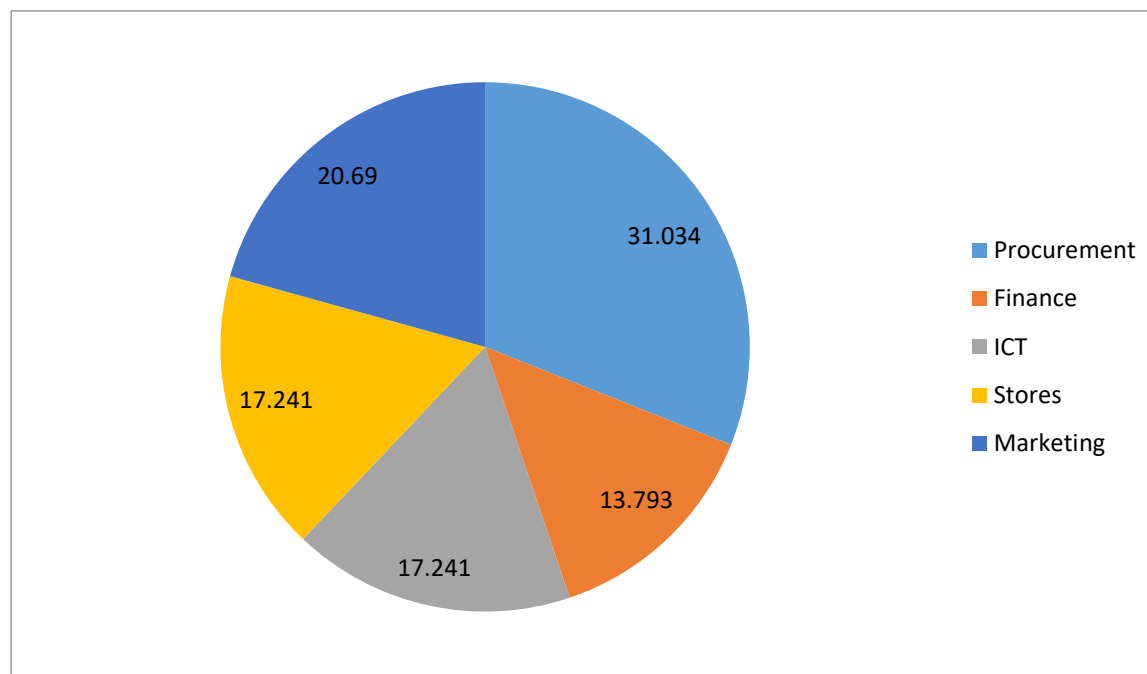
Department

Figure 4. 1: Distribution of respondents by departments

From the findings most of the respondents belonged to procurement section (31.03%) followed by marketing section (20.69%) then stores and ICT sections with 17.24% and finally the finance section with 13.79%. This means that the response was distributed fairly among the functional departments which deal with the functioning of the EPOS system in supermarkets. This shows that the respondents had adequate functional EPOS exposure and therefore they possess the necessary EPOS operational knowledge and skills considered useful for this study.

Descriptive analysis

Descriptive statistic is the term give to the analysis of data that helps describe, show or summarize data in a meaningful way. Descriptive analysis was used to describe the basic features of the data in the study giving a summary about the sample and the measure. It also helped in the simplification of large amounts of data in a sensible and manageable form. It expressed the variables, frequencies, percentages, means and standard deviation.

Rapid scan systems

The study sought to establish the role of rapid scan systems on the performance of supply chain in retail sector. Rapid scanning involves getting to the till point and having multiple lasers scanning all customers items in seconds. That certainly beats the current self-serve option at supermarkets these days that are generally cumbersome and temperamental. The rapid scan system improves the speed with which shoppers can check out by using lasers that can record about sixty barcodes every minute

Table 4. 3: Percentages distribution of respondents' perception on rapid scan systems

Rapid scan systems	Not at all	Small extent	Moderate extent	Large Extent	Very large extent	Mean
Our organization uses EPOS to track inventory	13.8%	10.3%	10.3%	27.6%	37.9%	3.66
Rapid scan systems eliminate human errors	6.9%	6.9%	27.6%	27.6%	31.0%	3.69
EPOS helps in calculating how much to order	6.9%	17.2%	17.2%	34.5%	24.1%	3.52
Scanning systems promote better decision making because of accurate and raid data	0%	6.9%	24.1%	51.7%	17.2%	3.79
Scan systems provide rapid, accurate and efficient means of data processing	13.8%	10.3%	6.9%	48.3%	20.7%	3.52
Automatic reordering improve service speed to customers	0%	37.9%	6.9%	48.3%	6.9%	3.24
Use of Rapid scan systems amounts to reduced revenue losses resulting from data errors	6.9%	3.4%	17.2%	51.7%	20.7%	3.76
Rapid scan systems speed customer check out hence reduced queues	0%	20.7%	34.5%	44.5%	0%	3.24

From the findings in Table 4.3 the respondents agreed that supermarkets nowadays use the Electronic point of sale to track inventory (Mean=3.66). This ensures that the inventory levels are rightly managed and instances of overstocking or stock outs are reduced to bare minimum. EPOS system helps retail firms to calculate how much to order (Mean=3.52) by provision of data needed to make quantity decisions. The use of rapid scan systems in retail firms also eliminate the possibility of human error (Mean 3.69). This is because use of these scan systems improves accuracy of processes hence reduced losses resultant from human mathematical errors. The rapid scan systems promote better decision making (Mean =3.79) because data is obtained rapidly and accurately. This enables accurate but instant decision making in times of urgency. Scan systems also provide a rapid, accurate and efficient means of collecting, processing, transmitting, recording and managing data in retail firms (Mean=3.52)

The use of EPOS and the provision of real time inventory data enables automatic reordering which improves the service speed to customers (Mean =3.24). This improves customers satisfaction hence increased sales emanating from repurchase rate. Use of rapid scan systems in retail firms also amount to reduced revenue losses resulting from data collection errors (Mean=3.76). This is possible because rapid scan systems provide an accurate means of data collection. From the findings the use of rapid scan systems in retail firms speed customer check out hence reduced

queues in the firms (Mean 3.24). This makes customer service speed fast hence customer smiles and reduce time wastage.

Cloud based communication systems

The study sought to establish the role of cloud based communication systems on the performance of supply chain in retail sector.

Table 4. 4: Percentages distribution of respondents' perception on cloud based communication systems

cloud based communication systems	Not at all	Small extent	Moderate extent	Large Extent	Very large extent	Mean
Our organization uses EPOS data for purposes of shelf filling	0%	13.8%	13.8%	44.8%	27.6%	3.86
Our firm regularly generates business performance reports from EPOS system	6.9%	10.3%	24.1%	17.2%	41.4%	3.76
Firm cloud provider has quick data retrieval	6.9%	20.7%	17.2%	27.6%	27.6%	3.48
EPOS data helps our company identify patterns of products purchased	6.9%	20.7%	17.2%	27.6%	27.6%	3.48
EPOS provides data that quicken the rate of shelf filling	6.9%	27.6%	3.4%	48.3%	13.8%	3.34
Cloud communications is safe and requires different levels of configuration and management	3.4%	37.9%	6.9%	41.4%	10.3%	3.17
Cloud based unified communication is cost effective for retail firms	6.9%	10.3%	27.6%	48.3%	6.9%	3.38

From the findings in Table 4.4 retail firms use EPOS for the purposes of shelf filling (Mean 3.86). This is necessitated by the accurate inventory data and information provided by EPOS to stock keepers. Retail firms regularly generate business performance analysis and performance reports from EPOS systems (Mean= 3.76). This makes reporting easier and accurate for the sake of books of account. The reporting also becomes real time hence better decision making. Inventory in retail firms involve huge chunks of data which is kept in safe custody by the use of cloud communication system. Firm cloud providers have data recovery and business continuity plan in place that enables quick data retrieval (Mean =3.48). This boosts the safety and security of inventory data.

EPOS data is very important as it helps a retail firm to identify patterns of products purchased (Mean=3.48) and also provides a firm with data that quicken the rate of shelf filling (Mean=3.34). From the findings respondents agreed that cloud communications is safe and requires different

39

levels of configuration and management for both software and hardware (Mean =3.17). Also respondents admitted that cloud based unified communications is cost effective for retail firms because it eliminates the need to pay for the installation and maintenance of a traditional phone system (Mean=3.38)

Mobile point of sale

The study sought to establish the role of mobile point of sale on the performance of supply chain in retail sector

Table 4. 5: Percentages distribution of respondents' perception on mobile point of sale

Mobile point of sale	Not at all	Small extent	Moderate extent	Large Extent	Very large extent	Mean
Use of Mobile POS enables easy management of long lines during the busiest parts of sales day	0%	20.7%	20.7%	44.8%	13.8%	3.52
Use of Mobile point of sale makes sales associates get the customer details before during and after sale	6.9%	20.7%	13.8%	37.9%	20.7%	3.45
With mobile POS a retail from can consider new ways to drive sales in different parts of its store	0%	6.9%	34.5%	44.8%	13.8%	3.66
Customer get frustrated when there is a question about a price or availability of item and employees don't have tools to provide quick answers	6.9%	6.9%	20.7%	48.3%	17.2%	3.62
In case multiple stores sharing a mobile POS devices across locations is possible so they can be used where and when it makes most sense	6.9%	13.8%	17.2%	48.3%	13.8%	3.48
Mobile point of sale offers the opportunity to truly sell anywhere that has an online connection allowing growth of business	6.9%	6.9%	17.2%	48.3%	20.7%	3.69

From the findings in Table 4.5, Retail firms used Mobile point of sale. Mobile point of sale enables easy management of long queues during the busiest parts of sales day, avoiding any potential customers satisfaction issues or even lost sales due to long waits (Mean=3.52). Mobile POS also makes sales associates get the customer details before, during and after sale from anywhere in the store (Mean=3.45). This helps retail firms in customer retention. With mobile POS a retail firm can consider new ways to drive sales in different parts of the store (Mean= 3.66).

Normally clients get frustrated when there is a question about a cost or accessibility of a thing and a store worker doesn't have the instruments to give a fast answer frame (Mean=3.62). Utilization of mobile POS dispense with this dissatisfactions since it gives answers. If there should arise an occurrence of numerous stores sharing of mobile POS gadgets crosswise over areas is conceivable so they can be utilized where and when it bodes well (Mean =3.48). Respondents concur that versatile POS offers the chance to genuinely offer anyplace that has an online association back to the store POS and stock framework permitting development of business in an assortment of ways (Mean= 3.69)

Electronic Fund Transfer In Point of Sale

The study sought to establish the role of EFTPOS on the performance of supply chain in retail sector.

Table 4. 6: Percentages distribution of respondents' perception on EFTPOS

EFTPOS	Not at all	Small extent	Moderate extent	Large Extent	Very large extent	Mean
Customers want to pay for goods and services in the most convenient way possible	0%	17.2%	13.8%	27.6%	41.4%	3.93
Payment via debit and credit cards encourages customers to spend more than payment in cash	6.9%	6.9%	34.5%	24.1%	27.6%	3.59
Use of EFTPOS eliminates need for retailers to take frequent visits to bank	6.9%	17.2%	27.6%	34.5%	13.8%	3.31
EFTPOS machines are easy to install and are user friendly	0%	17.2%	13.8%	44.8%	24.1%	3.76
EFTPOS machines are portable and lets cashiers take payments anywhere, anytime leading to more convenient transactions	6.9%	10.3%	24.1%	31%	27.6%	3.62
For small purchases, it is quicker to pay in cash	20.7%	20.7%	10.3%	31%	17.2%	3.03

From the findings in Table 4.6, Customers nowadays want to be able to pay for goods or services they need in the most convenient way possible and that includes using the mode of payment of their choice (Mean=3.93). Among the modes preferred is the EFTPOS which is convenient and safe. EFTPOS involves use of several electronic ways of fund transfer that may include use of debit and credit cards among others. Customers paying through credit and debit cards are likely to spend more, return for more purchases and buy an up-sell than those who pay in cash (Mean=3.59).

Respondents agreed that the use of EFTPOS eliminates the need for retail owners to take frequent trips to the bank and stand in long queues to deposit funds to their account (Mean=3.31.)

The ease of using EFTPOS is made possible since EFTPOS machines are easy to install and are credibly user-friendly (Mean=3.76). This makes their use not complicated. The wide usage and

preference of EFTPOS is also due to portability of the machines (Mean 3.62). It lets cashiers take payments anywhere, anytime, leading to more convenient and hassle free transactions for retail and customers. The challenge of using EFTPOS is that it's not effective for small purchases (Mean 3.03). For small purchases it's usually quicker to pay in cash.

Supply chain performance

The study sought to establish the extent that retail firms achieved benefits from the use of EPOS systems.

Table 4. 7: Percentages distribution of respondents' perception on Supply chain performance

Supply chain performance	Not at all	Small extent	Moderate extent	Large Extent	Very large extent	Mean
Cost reduction	0%	27.6%	6.9%	41.4%	24.1%	3.62
Increased customer satisfaction	6.9%	6.9%	24.1%	34.5%	27.6%	3.69
Increased service speed	0%	13.8%	37.9%	20.7%	27.6%	3.62
Reduced queues	13.8%	6.9%	27.6%	41.4%	10.3%	3.28
Improved supplier relationship	0%	13.8%	31%	44.8%	10.3%	3.52
Supply chain responsiveness and agility	6.9%	0%	27.6%	55.2%	10.3%	3.62
Competitive advantage	0%	6.9%	41.4%	31%	20.7%	3.66
Increased sales	13.8%	6.9%	27.6%	24.1%	27.6%	3.45

As the maxim goes, it is no longer firm competing against firm rather; it is supply chain vs. supply chain. As the competitive focus shift from the firm to the supply chain, it must be recognized that, like physical chains, no supply chain is stronger than its weakest link. This shows the rationale played by supply chain performance. Respondents were asked the extent to which the retail firms have realized business values on their supply chains as a result of the use and application of Electronic Point of Sale. From the findings in the Table 4.7 it's evident that the retail firms have realized a wide range of benefits resultant from the EPOS use in retailing. Among the listed include; cost reduction, increased customer satisfaction, increased service speed, reduced queues, improved supplier relationship, supply chain responsiveness and agility, competitive advantage and increased sales. All this benefits have being realized upon effective and controlled use of Electronic Point of Sale in retail firms.

Inferential Analysis

Correlations of the Study Variables

Table 4.8 illustrate the correlation matrix among the study variables. Correlation was used to explore the relationship among the group of the study variables. Since the independent variables were measuring the same dependent variable, it was expected that there existed some association between the predictor variables even if the relationship is not significant.

Table 4. 8: Correlation of study variables

Correlations

		Rapid scan systems	Cloud based communication systems	Mobile point of sale	EFTPOS	Supply chain performance
Rapid scan systems	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	29				
Cloud based communication systems	Pearson Correlation	.695[**]	1			
	Sig. (2-tailed)	.000				
	N	29	29			
Mobile point of sale	Pearson Correlation	.755[**]	.602[**]	1		
	Sig. (2-tailed)	.000	.001			
	N	29	29	29		
EFTPOS	Pearson Correlation	.597[**]	.508[**]	.590[**]	1	
	Sig. (2-tailed)	.001	.005	.001		
	N	29	29	29	29	
Supply chain performance	Pearson Correlation	.607[**]	.655[**]	.716[**]	.795[**]	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	29	29	29	29	29

From the Table 4.8 the results shows presence of a positive and significant strong relationship between rapid scan systems and cloud based communications as proved by the p-value and the correlation coefficient (r=0.695, p=0.000). There is a strong and significant relationship between rapid scan systems and mobile point of sale since the p value of 0.00 is less than 0.05 level of significance and the correlation coefficient is 0.755. The correlation matrix table shows presence of strong and significant positive relationship between mobile point of sale and cloud based communication (r=0.602, p=0.001).

There is an evidence of significant moderate relationship between EFTPOS and rapid scan systems as attributed by the p value and correlation coefficient (r=0.597, p=0.001). Furthermore, the results of the table show presence of a significant strong positive relationship between EFTPOS and cloud based communication systems as proved by the Pearson correlation coefficient of 0.508 and a p-value of 0.005.

From the table, all the independent variables are positively related to supply chain performance as attested by the respective correlation coefficients: rapid scan systems (r=0.607), cloud based communications (r=0.655), mobile point of sale (r=0.716) and EFTPOS (r=0.795). All the relationships are rendered significant since their p values are less than 0.05. Accordingly, the ranking of the independent variables with their contribution to supply chain performance was: EFTPOS contributed more to supply chain performance of retail firms (79.5%), followed by mobile point of sale (71.6%), followed by cloud based communications (65.5%) and finally rapid scan systems (60.7%).

Regression Analysis results

This study utilized multiple linear regression analysis to examine the relationship of the predictor variables with the dependent variable. Adjusted R^2 which is known as the coefficient of determination was used to explain how supply chain performance varied with rapid scan systems, cloud based communications systems, EFTPOS and mobile point of sale. The model summary table shows that 73.2% of change in supply chain performance can be explained by four predictors namely rapid scan systems, cloud based communications systems, EFTPOS and mobile point of sale an implication that the remaining 26.8% of the variation in supply chain performance could be accounted for by other factors not considered in this study.

Table 4. 9: Model Summary

Model Summary			
Model R	R Square	Adjusted R Square	Std. Error of the Estimate
.878[a]	.770	.732	.594

Predictors: (Constant), rapid scan systems, cloud based communications systems, EFTPOS and mobile point of sale

Analysis of variance (ANOVA) was done to establish the fitness of the model used. The ANOVA table shows that the F-ratio (F=20.119, p=.000) was statistically significant. This means that the model used was appropriate and the relationship of the variables shown could not have occurred by chance.

Table 4. 10: ANOVA

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	28.367	4	7.092	20.119	.000[b]
	Residual	8.460	24	.353		
	Total	36.828	28			

a. Dependent Variable: Supply chain performance

b. Predictors: (Constant), rapid scan systems, cloud based communications systems, EFTPOS and mobile point of sale

Table 4. 11: Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	.164	.453		.361	.721
	Rapid scan systems	.163	.136	.205	1.195	.044
	Cloud based communication systems	.262	.123	.297	2.133	.043
	Mobile point of sale	.428	.182	.369	2.360	.027
	EFTPOS	.522	.121	.549	4.308	.000

a. Dependent Variable: Supply chain performance

The above table gives the results for the regression coefficient for the multiple linear equation ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$) which by supplying the coefficients becomes:

$$Y = 0.164 + 0.163\ X_1 + 0.262 X_2 + 0.428 X_3 + 0.522 X_4$$

Where

Y = Supply chain performance of retail firms

X_1 =Rapid scan systems

X_2 =Cloud based communication

X_3 =Mobile point of sale

X_4 =EFTPOS

According to the regression equation established, holding all independent factors a constant then supply chain performance will be 0.164 units. From the regression equation holding all other independent variables a constant, a unit increase in rapid scan systems will lead to a 0.163 improvement in supply chain performance; a unit change in Cloud based communication will lead to a 0.262 increase in supply chain performance; a unit increase in mobile point of sale will lead to a 0.428 increase in supply chain performance and a unit increase in EFTPOS will lead to a 0.522 increase in Supply chain performance.

However, at 5% level of significance and 95% level of confidence rapid scan systems, cloud based communications systems, mobile point of sale and EFTPOS have a significance influence on the supply chain performance with p-values of 0.044, 0.043 , 0.027 and 0.000 respectively and therefore their coefficients should be retained in the final model.

The results further infers that of all the predictors considered in this study EFTPOS contributes the most to the supply chain performance followed by mobile point of sale as implicated by their larger coefficients.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study sought to ascertain the role of electronic point of sale on supply chain performance in the retail sector in Kenya. The specific objectives that guided that study included; to find out the role of rapid scan systems on supply chain performance of retail firms in Kenya; to determine the role of cloud based communication system on supply chain performance of retail firms in Kenya; to establish the role of EFTPOS on supply chain performance of retail firms in Kenya and to assess the role of Mobile Point of Sale on supply chain performance of retail firms in Kenya.This study employed a Cross sectional survey research design to achieve these objectives.

The study population comprised of 156 supermarkets, that is, all the supermarkets within Nairobi County as listed in Appendix 4. Since comprehensive list of supermarkets in Nairobi does not exist details were compiled from Yellow Pages of Official Kenya Directories, Nairobi Edition (2015). The study employed purposive sampling technique by using a sample comprising of all 7 multi-tier supermarkets to select a representation of the sample frame in terms of critical factor-supermarkets with at least five branches (that' is, retail chain) - as a basis for sampling. The primary reason why the sample was strictly limited to these supermarkets was because they were perceived to be well organized, structured and innovative and getting information from them was easier. In each supermarket headquarter, five employees specifically those working in Procurement section, Stores & inventory management section, Finance and Accounts, Information Technology

46

departments and marketing section were targeted. This is because these are the employees that are directly involved with the functioning of the EPOS system making the sample size to be 35 respondents.

A questionnaire containing both structured and unstructured questions was used to collect primary data for this study. The questionnaires were distributed using drop-and-pick later method to the respondents. A pilot study was carried out among the retail firms who did not take part in the main study. Data collected was analysed using descriptive and inferential analysis methods. A multiple linear regression analysis was used to analyse the role of rapid scan systems, cloud based communication systems, Mobile point of sale and EFTPOS on supply chain performance. SPSS version 21 was used to aid in data analysis. Data analysis results were presented using charts and tables. Multiple linear regression results have shown that four predictors namely rapid scan systems, cloud based communications systems, EFTPOS and mobile point of sale can explain 73.2% of change in supply chain performance an implication that the remaining 26.8% of the variation in supply chain performance could be accounted for by other factors not considered in this study.

Conclusion

From the findings Electronic point of sale play an important role in the supply chain performance. This is where rapid scan systems provides better decision making capability in the consumer packaged goods area based on the collection of electronic scanner data during increased complex situations that occur in supply chain fields. Rapid scanning involves getting to the till point and having multiple lasers scanning all customers items in seconds. That certainly beats the current self-serve option at supermarkets these days that are generally cumbersome and temperamental. The rapid scan system improves the speed with which shoppers can check out by using lasers that can record about sixty barcodes every minute.

The use of cloud based communications gives EPOS system the ability to produce a variety of business analysis and performance reports concerning inventory in retail stores. These reports range from basic analysis of day to day or annual profit margins, to identification of top selling products or services in a retail firm. Such information has the ability to provide a business with useful picture of their overall supply chain performance and can be of relevance when it comes to conducting marketing campaigns. Moreover, the ability of EPOS systems to store information and produce reports can help a business detect where the demand on a product lies and use this information to reduce inventory especially of slow moving goods. Other form of reports that can be obtained from EPOS include vouchers and receipts which the company can send to suppliers and thus improve business reliability.

With point of sale solutions the client can harness energy of an advanced cell, tablet or other cell phone to acknowledge payments on the spot. Utilizing versatile POS keeps clients traveling through the registration line as proficiently as conceivable notwithstanding amid deals surge times. Utilizing Mobile purpose of offer can likewise evade back-ups at the business enlists because of profits and furthermore enhance consumer loyalty and assist maintain a strategic distance from lost deals with Mobile POS solutions.

Lastly, the study found out that EFTPOS use is domineering the retail market as clients these days need to have the capacity to pay for products or administrations they require in the most helpful way that could be available and that incorporates utilizing their preferred method of payment. EFTPOS involves use of several electronic ways of fund transfer that may include use of debit and credit cards among others. Customers paying through credit and debit cards are likely to spend more, return for more purchases and buy an up-sell than those who pay in cash. The ease of using EFTPOS is made possible since EFTPOS machines are easy to install and are credibly user-friendly making them portable and convenient in payment.

Recommendations

Given the role Electronic Point of Sale has on supply chain performance, Supermarkets should constantly look at ways to improve customer experience through the use of EPOS. The reason they ought to take a gander at this is on the grounds that the objective of all retailers is to enhance client steadfastness consequently expanded deals and benefits. By enhancing the client involvement in EPOS will build the client loyalty.

Supermarkets should also use EPOS appropriately to reduce the long queues. The queue wait time and number of people in the queue ought to be monitored and improvements noted. This can be done by use of rapid scan systems, quick decision making, use of mobile point of sales and through quick and fast payments. This can also be necessitated by change of staffing schedules to guarantee the right number of prepared checkout staff are nearby in synchronization with arriving client volumes. Enhancements can be as basic as moving more staff onto the check outs or to put resources into changing the sort of checkouts from customary trolley path to express checkouts

Supermarkets should embrace and invest in the use of Rapid Scan systems, a retail technology that massively improves the speed with which items can be scanned on a retail conveyor belt. Cashiers are not required to manually handle and scan items – therefore there is a time saving. The retail owners should also be aware of the limitations of the Rapid Scan systems as the preferred payment process is cashless, so incorporation of EFTPOS is of essence.

Areas for further research

This study was not exhaustive by any means and therefore it is recommended that another study be replicated in other sectors of the economy, such as manufacturing sector and public & government institutions. This is because Electronic point of sale in supply chain management is a new rich research field that is still evolving. A similar research in retailing sector will also need to be carried out over time to see if they validate, support or controvert the findings of this particular study.

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