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FACTORS INFLUENCING PERFORMANCE OF SUPPLY CHAIN MANAGEMENT STRATEGIES IN THE NATIONAL GOVERNMENT MINISTRIES IN KENYA

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ABSTRACT

This study investigated the factors influencing performance of supply chain management strategies in the national government ministries in Kenya. It was established that IT led to increased flexibility towards serving customer demands. Better use of information technology led to increased inventory control and timely deliveries. Supply chain relationship led to increased customer satisfaction due to better product quality, service delivery and an increased value for money. It was evident that supply chain relationship played a major role in impressing stakeholders with the seriousness of partner intentions. Finding indicated that procurement regulations affected performance of supply chain management strategies. It was established that there was efficiency in the procurement process in the national government ministries and supply chain performance affected their purchasing cycle time. Environmental uncertainties affected performance of supply chain management strategies. It was concluded that information in supply chain was an important factor for favorable and optimal decision for development and survival. The cause of poor efficiency in supply chain was due to lack of accuracy and adequacy in information systems that were responsible for providing and processing of the information. Strong partnerships were critical to performance in supply chain management strategies. Successful supply chain relationships required supervision of suppliers, development of compatible technical capabilities and sharing of information intensively and selectively leading to little or no investment in extra human resources for a tighter relationship with suppliers. The study recommended that supply chain management professionals in the national government ministries needed to embrace collaborative relationships with their suppliers so as to optimize their supply chain costs. Ethics education to the national government procuring entities staff was important to ensure that they served in ultimate objectivity, accountability, and non-discrimination. Organization code of ethics should also be put in place and adhered to. Building the capacity of service providers had been identified as one of the success factors of public procurement reforms. The research results suggested the importance of building partnerships within the supply chain through co-operation and long-term commitment which would increase satisfaction with overall supplier performance.

Keywords: *IT, Supply Chain Relationships, Regulations, Environmental Uncertainties, Supply Chain Management*

INTRODUCTION

The globalization of the business operation has forced organizations as well as government entities to widen their resources and capability through establishment of appropriate policies to greater heights. As a result, attention is increasingly drifting towards external collaboration and networking outside the boundaries of the organization. This change is necessary in order for a firm to remain competitive locally and internationally (Rose-Ackerman, 2011). A strong integration of both upstream and downstream relationship with other stakeholders will help any institution to develop necessary competitiveness. Supply Chain Management (SCM) has over the recent years taken great importance due to its potential to enhance operational success. According to Sundram, Ibrahim and Chandran Govindaraju (2011), in order for an organization to meet customer requirement, the integration of various business processes such as demand planning and forecasting, procurement, distribution and return of resources from point of origin to destination has become an important practice in SCM. The simultaneous integration of customer requirements, internal processes, and upstream supplier performance is commonly referred to as supply chain management. The SCM is an integrated approach beginning with planning and control of materials, logistics, services, and information stream from suppliers to manufacturers or service providers to the end client; it represents a most important change in business management strategies (Sundram *et al.,* 2011). The SCM is one of the most effective ways for firms to improve their performance. With the purpose of managing the supply chain actions for realizing improvement in enterprise performance, it is necessary to improve the planning and management of activities such as materials planning, inventory management, capacity and logistics planning with suppliers and clients. Various studies have been conducted to identify different SCM strategies. (Koplin *et.al.* 2007) determined the underlying dimensions of SCM strategies and tested empirically and framework identifying the relationship among SCM strategies, operational performance and SCM-related organizational performance for SMEs in Turkey. The set of twelve SCM strategies identified were: close partnership with suppliers; close partnerships with customers. Supply Chain benchmarking; JIT Supply E-procurement, few suppliers; many suppliers; strategic planning; outsourcing; subcontracting; holding safety stock and 3PL (Pochard, 2012) study on development of SCM strategies identified a set of four reliable and valid strategies significant to SCM. Ulusoy (2003) identified four SCM strategies while assessing the supply chain and innovation management in manufacturing industries of Turkey, They are; logistics, supplier relations, customer relations and production. Similarly a study conducted by Lee and Kuncade (2003) proposed six major dimensions of SCM: partnership; information technology; operational flexibility; performance measurement; management commitment and demand characterization. Talib, Rahman and Qureshi (2011) on the other hand used eleven supply quality-management practices to study and test manager's perception on the association between Supply chain quality-management practices and organizational performance. The eleven factors were; Top management leadership, training; product design, supplier quality management; process management; quality data reporting, employees' relationships; customers' relations, benchmarking; supplier selection; and supplier participation. They found that perceived improvements in organizational performance are associated with improvements in supply chain quality management.

Statement of the problem

Supply chain management (SCM) is one of the key mechanisms enabling government to implement policy. It has been misunderstood, undervalued and under-capacitated as its strategic importance has not been recognized. The negative effects of inefficient public sector SCM particularly in the procurement phase of the chain are well documented. Suppliers charge high prices and offer low quality goods and services. Performances of Supply chain management strategies are important to the government ministries service delivery, yet its performances have been a challenge. According to Perez (2013) proper alignment of the supply chain with business strategy is essential to ensure better performance. Amongst the factors helping SCM performances are the use of information technology, supply chain relationships, regulatory framework and environmental issues. Currently, there is growing pressure on public bodies to improve performance on procurement. Despite government concentrated efforts in reforming procurement systems, still there are problems attributable to huge losses of about KShs. 30 billion (CBK, 2013). Public procurement requires a tight system to be adopted since resources are scarce. The efficiency of the procurement process is vital to every procurement regime. The public sector operation has been criticized for slow speed of implementing projects, poor service delivery and delayed payments. Unfortunately, the SCM services in the government ministries have been marred by poor performances. Several studies on SCM performances in the public sector have been done, which shows gaps in the system. Particularly, studies were carried out by Moberg, Speh, and Freese (2010), Kapila (2008), Kangogo, (2013) and Ross (2014) but none of them specified the cause behind this. Therefore, this study sought to investigate Factors Influencing Performance of Supply Chain Management Strategies in the National Government (NG) Ministries in Kenya.

Study Objectives

- To examine the influence of information technology on the performance of supply chain management strategies in the national government ministries in Kenya
- To investigate the influence of supply chain relationships on the performance of supply chain management strategies in the national government ministries in Kenya
- To find out the influence of regulatory framework on the performance of supply chain management strategies in the national government ministries in Kenya
- To determine the influence of environmental uncertainties on the performance of supply chain management strategies in the national government ministries in Kenya

LITERATURE REVIEW

Theoretical review

Technology acceptance model

The Technology Acceptance Model (TAM) pioneered by Davis (2010) advances the Theory of Reasoned Action (TRA) by postulating that perceived usefulness (PU) and perceived ease of use (PEU) are key determinants that inevitably lead to the actual usage of a particular technology or system. Perceived usefulness is defined as the degree to which an individual believes that using a particular system would enhance his or her productivity while perceived ease of use is defined as the degree an individual believes that using a particular system would be free of effort (Davis, 2010). Between the two, perceived ease of use has a direct effect on both perceived usefulness and technology usage (Adams, Nelson & Todd, 2012).

Dishaw and Strong (2011) have summarized that TAM represents the tailoring of a well-developed social psychology theory, the Theory of Reasoned

Action (TRA), to the specific behavior of using IT. TAM theorizes that an individual's behavioral intention to adopt a technological system or innovation is determined by two beliefs, perceived usefulness and perceived ease of use. Davis (2010) has also found that there is a relationship between users' beliefs about a technology's usefulness and the attitude and the intention to use the technology. However, perceived usefulness exhibited a stronger and more consistent relationship with usage than did other variables reported in the literature. In addition, an individual may adopt a technology if he or she perceives it as convenient, useful and socially important even though they do not enjoy using the technology (Saga & Zmud, 2011). Thus, there might be a possibility of a direct relationship between beliefs and intentions. Furthermore, it is suggested that there are external variables that affect both perceived ease of use and perceived usefulness (Davis et al., 2010). TAM theory explains the determinants of user acceptance of a wide range of end-user computing technologies. TAM identifies two theoretical constructs including Perceived Usefulness (PU) and Perceived Ease of Use (PEU) that affect the intention to use a system. There are a number of studies that have used TAM as their theoretical background for explaining ICT adoption and use especially on the factors affecting its adoption. Scholars already confirmed that PU has a positive relationship with both adoption intention and continuance intention (Ritu and Agarwal, 2010). In post adoption studies, PU has been found to influence satisfaction and attitude toward the technology. PEU has been found to influence both PU and adoption intention. Even though TAM was found to be a valid theoretical framework in studying ICT adoption and use, it has been criticized for its several limitations including the original model's intended generality and parsimony (Dishaw and Strong, 2011), not considering non-organizational setting (Venkatesh and Davis, 2012), and overlooking the moderating effects of ICT adoption and use in different situations (Sun &and Zhang, 2006).

Theory of Constraints (TOC)

The theory of constraints (TOC) has been widely known as a management philosophy coined by Goldratt (2011) that aims to initiate and implement breakthrough improvement through focusing on a constraint that prevents a system from achieving a higher level of performance. The TOC paradigm essentially states that every firm must have at least one constraint. Goldratt and Cox (2010) define a constraint as any element or factor that limits the system from doing more of what it was designed to accomplish (i.e., achieving its goal). The owner of a system is assumed to establish its goal. The fundamental goal of most business entities is to make money now and in the future. Other stakeholders may develop necessary conditions that must be met to allow the system to continue operating. The TOC thus encourages managers to identify what is preventing them from moving towards their goals - as well as necessary conditions - and find solutions to overcome this limitation. The TOC comprises a set of three separate but interrelated areas – namely, logistics, performance measurement, and logical thinking (Cox and Spencer, 2010; Simatupang *et al.*, 2011). The TOC applications to logistics include the drum-buffer-rope scheduling method, buffer management, and the value added (VA) analysis. Measurements are required to determine whether or not the system is accomplishing its goal of making money. Performance Measurement includes operating measures-that is; throughput, inventory, operating expenses and local performance measures – that is; throughput dollar-days and inventory dollar-days. Logical thinking comprises the five-step focusing process and the thinking processes. The TOC solutions initially attempted to resolve core problems in production systems using methods such as the drum-buffer-rope scheduling,

constraint-focused performance measurement, and buffer management (Goldratt and Cox, 2010). Further development of the TOC incorporates solutions for marketing and sales (Goldratt, 2011), project management (Goldratt, 1997), and supply chain management (Goldratt *et al.*, 2012). Blackstone (2011) provides an exhaustive review of the latest developments of the TOC applications. Little attention has been given, within the literature, to the application of the TOC concepts to the management of supply chains where collaboration must be fostered between independent firms. Covington (2009) applied the TOC thinking process to identify problems in the apparel supply chain and describes the bringing together of managers from different firms to cooperate in improving the overall supply chain profit. Stein (2010) proposed a conceptual model of locating the time buffer at different positions of participating members to protect actual sales from demand and supply uncertainty.

Public Interest Theories of Regulation

The first group of regulation theories account for regulation from the point of view of aiming for public interest. This public interest can be further described as the best possible allocation of scarce resources for individual and collective good (Boadway & Bruce, 2011). In western economies, the allocation of scarce resources is to a significant extent coordinated by the market mechanism. In theory, it can even be demonstrated that, under certain circumstances, the allocation of resources by means of the market mechanism is optimal (Arrow, 2010). Because these conditions are frequently not adhered to in practice, the allocation of resources is not optimal and a demand for methods for improving the allocation arises (Hortwise, 2012). One of the methods of achieving efficiency in the allocation of resources is government regulation (Arrow, 1985). According to public interest theory, government regulation is the instrument for overcoming the disadvantages of imperfect competition, unbalanced market operation, missing markets and undesirable market results (Rose-Ackerman, 2011). In the first place, regulation can improve the allocation by facilitating, maintaining, or imitating market operation. The exchange of goods and production factors in markets assumes the definition, allocation and assertion of individual property rights and freedom to contract (Park & Krishnan, 2013). The guarantee of property rights and any necessary enforcement of contract compliance can be more efficiently organized collectively than individually. Furthermore, the costs of market transactions are reduced by property and contract law (Goldberg, 2010). The freedom to contract can, however, also be used to achieve cooperation between parties opposed to market operation. Agreements between producers give rise to prices deviating from the marginal costs and an inefficient quantity of goods is put on the market (Dixit, 2012). Antimonopoly legislation is aimed at maintaining the market operation through monitoring the creation of positions of economic power and by prohibiting competition limiting agreements or punishing the misuse thereof (Park & Krishnan, 2013). According to Pejovich (2013), summarizing, the public interest theories of regulation depart from essentially three assumptions: the prevalence of a market failure, the assumption of a 'benevolent regulator' or, alternatively, an efficient political process and the choice of efficient regulatory institutions even if the competitive market mechanism allocates scarce resources efficiently, the outcomes of the market processes might still considered to be unjust or undesirable from other social perspectives.

Purchasing Portfolio Theory

Kraljic (1983) introduced the first comprehensive portfolio approach for the use in purchasing and supply management. Some 20 years ago, he advised managers to guard their firms against disastrous

supply interruptions and to cope with changing economic and technological dynamics. His message was that ‘‘purchasing must become supply management.’’ In this context, Kraljic (1983) developed a convenient portfolio approach for the determination of a comprehensive strategy for supply. Kraljic’s approach includes the construction of a portfolio matrix that classifies purchased products and services on the basis of two dimensions: profit impact and supply risk (‘‘low’’ and ‘‘high’’). The result is a 2 X 2 matrix and a classification into four categories: bottleneck, noncritical, leverage and strategic items. Each of the four categories requires a distinctive approach toward supplier management (Cox, 2010). One of supply management’s most important task is to manage the relationships with suppliers. To achieve effective supply management, the company needs to keep balance between the relationships with its suppliers (Donaldson & O’toole, 2011). One of the earliest and cited by many as one of the most fundamental purchasing portfolio models is constructed by Olsen and Ellram (1997). Olsen and Ellram proposed three forms of managing different kinds of supplier relationship. Nellore and Soderquist (2012) observed that specifications were absent in modern portfolio approach. They state that specification forms the language for engineering. It refers to all activities that are necessary, from the identification to the generation of the component or product; and specifications vary for different types of suppliers due to the differences in both the type and the generators of the specifications (Johnson & Davis, 2012). Fiocca’s account portfolio for marketing is included in the present study on purchasing because of the special relationship between the portfolios used in the two disciplines. Both deal with the company’s valuable assets – customers and suppliers (Cunningham, 2010), and it is essential to understand the needs from both in order to identify the central to the company’s competitive advantage (Cunningham and Homse, 2009). Leverage items allow the buying company to exploit its full purchasing power, for instance through tendering, target pricing and product substitution. Routine items are of low value, are ordered frequently and therefore cause high transaction costs (Olsen and Ellram, 1997; Van Weele, 2013). Therefore, strategies are aimed at reducing transaction costs through category management in e-procurement solutions. Bottleneck items cause significant problems and risks that should be handled by volume insurance, vendor supplier control, and safety stock and backup plans (Drayer, 2014). In some cases, a search for alternative suppliers or products is needed. Strategic items require a more collaborative strategy between both the buyer and the seller.

Conceptual framework

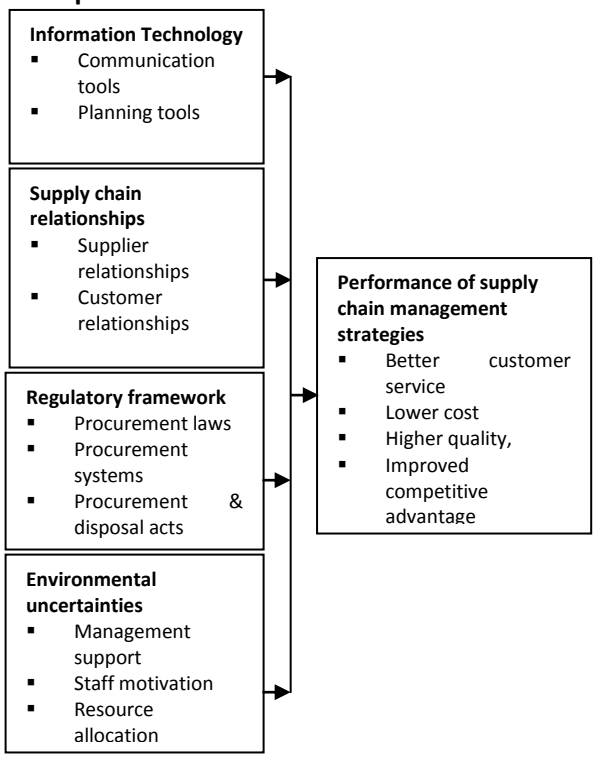

Figure 1: Conceptual Framework

Information Technology

Telecommunications and computer technology allow all the actors in the supply chain to communicate among each other. The use of information technology allows suppliers, manufacturers, distributors, retailers, and customers to reduce lead time, paperwork, and other unnecessary activities. It is also believed that managers will experience considerable advantages with its use such as the flow of information in a coordinated manner, access to information and data interchange, improved customer and supplier relationships, and inventory management (Schneider, 2012). It is also mentioned that managers will experience considerable advantages with its use such as the flow of information in a coordinated manner, access to information and inventory management not only at the national level but also internationally (Bayraktar et al., 2013). Also the advantages will include supply contracts via internet, distribution of strategies, outsourcing and procurement. All companies are looking for cost and lead time reductions with the purposeA of improving the level of service but also to enhance inter-organizational relationships (Humphreys et al. 2011). Supply Chain Management has emerged quickly throughout the early part of 21st Century due to improvement in technology. Technology is increasingly affordable and available to help organizations to take advantage of supply chain strategies. Because of the competitive pressures facing business it is critical for them to use supply chain strategies to create synergies with supply chain partners in order to succeed in the global competitive environment (Macleod, 2014). High level best practice for SCM, technology can apply to any business, even though the operation may be specific to an organization implementing a specific SCM System, for example, could be a waste of money if the overall operation is a problem. Automating a broken process does not fix the process (Francis, 2011). According to Towill (2012), companies are investing heavily in a variety of software. Most of the investment is targeted at one of the following applications: Enterprise Resource Planning (ERP) systems, Warehouse Management Systems (WMS), Transportation Management Systems (TMS), Advanced Planning and Scheduling (APS) systems, Satellite Tracking Systems (STS), computer-assisted ordering systems, Database Management System (DBMS) and mining, electronic data interchange (EDI), intranets and extranets, Point of Sales (POS) tracking systems, and Web-based catalogues. These new information applications have impacted every aspect of the order fulfillment process (Cachon and Lariviere, 2010). According to Mannem and Gudivada (2014), companies are investing heavily in a variety of software. Most of the investment is targeted at one of the following applications: enterprise resource planning (ERP) systems, warehouse management systems (WMS), transportation management systems, advanced planning and scheduling (APS) systems, satellite tracking systems, computer-assisted ordering systems, database management and mining, electronic data interchange (EDI), intranets and extranets, point of sales tracking systems, and Web-based catalogues. These new information applications have impacted every aspect of the order fulfillment process, from tracking inventory status to ordering, to picking and packing, to shipping to receiving to storing, information systems are used to eliminate uncertainty, reduce inventory, and increase responsiveness to customer requests. Information systems are used to eliminate uncertainty, reduce inventory, and increase responsiveness to customer requests (Upton & McAfee, 2012). Some of the important roles identified in the new information technologies are automated order placement, electronic funds transfer payment, facility location, stock keeping unit management, shipment consolidation, point of sales data capture, shipment tracking, customer

profiling, share best practices, supplier performance monitoring, computer aided design (CAD), advanced shipment notices, facility design, inventory control, transportation routing, warehouse management, automatic replenishment, product flow-through analysis, on-line bidding or auctions, purchasing compliance to policy, creation of global, consortiums or exchanges, share strategic information (e.g. technology plans) (Corbett and de Groote, 2010). The more advanced and more optimistic information technology companies have established policies designed to phase out non-electronic orders (from customers and to suppliers). Most of these companies have been heavily invested in EDI for several years and are transitioning as quickly as possible to Web-based systems. It is suggested that existing investments combined with limited bandwidth and security concerns will limit the Web's attractiveness (Moinzadeh, 2012).

Supply Chain Relationships

Supply chain relationships play an important role in achieving the firm's goals. The coordination and integration of activities with suppliers and understanding of customer's needs results in greater benefits for companies. According to Fraza (2000), Supply Chain Management is directly related to Relationship Management (RM), which includes suppliers and customers plus teamwork and team spirit. Strategic supplier partnerships and customer relationships are the main components in the supply chain management practices, leading to information sharing, which is one of the five pillars in achieving a solid supply chain relationship (Lalonde, 2012). Nyamasege and Biraori, (2015), contended that supplier relationship management is a comprehensive approach to managing an enterprise's interactions with the organizations that supply the goods and services it uses. The goal of supplier relationship management (SRM) is to streamline and make more effective the processes between an enterprise and its suppliers just as customer relationship management (CRM) is intended to streamline and make more effective the processes between an enterprise and its customers. Nyamasege and Biraori (2015) further noted that supplier involvement in product development allows firm to make better use of their supplier's capabilities and technology to deliver competitive products at reduced costs. Coordinating operational activities through joint planning also results in inventory reduction, smooth production, improve product quality and lead time reductions. They further argues that integration is an effective strategy in reducing suppliers cost throughout the product lifecycle which is an effective strategy in reducing supply uncertainty. Two sub-factors are considered in the model relationship with suppliers and customers. Companies are inclined to work with different suppliers in different ways. It is important that the relationship with suppliers satisfies their company needs. Lummus & Alber (2013) mentioned that in commodity products, it is common to find an adversarial relationship mainly based on price between buyer and supplier. This type of relationship with suppliers does not allow for cost reduction in the supply chain (Hortwise, 2012). It may be beneficial to network the supplier, to develop partnerships and alliances that will benefit both partners. This could be based on production, personal, and or symbolic networking, that will turn on strategic alliances (Hines, 2004), allowing the information sharing, risk sharing, obtaining mutual benefits and coordinating plans, permitting the improvement of the supply chain. The global markets offer a variety of products of different quality and cost (Woo and Ennew, 2014). As a result, companies are always competing and trying to reduce costs and improve quality. According to Burguess, (2011), customers look for more choices, better service, higher quality, and faster delivery. The relationship with customers has

turned a strategic issue for today's companies (Lages et al., 2013).

Supply chain relationship performance assessment should create clear joint understanding that empowers supply Chain RMs to fix the problems, monitor and sustain forward momentum and enter a virtuous circle of continuous, improvement. The result must allow the joint teams to focus on quality, innovation, communication, cost reductions, on time delivery, commitment to the future and trust, to achieve satisfied customers and sustained bottom line benefits. According to Andrew and Linda, (2010), the tangible results are: opportunities to increase revenue and shareholder value (Growth), increased customer satisfaction from better product/service quality and delivery (CRM). Retained customers by differentiating the joint offering and locking out competitors, reduced administration and production costs (Margins) and building joint capability to seize future business opportunities.

Regulatory Framework

Schotanus et al., (2011) in their study found out that many public entities are increasingly encouraged to pool or share purchasing volumes, information, and/ or resources. However, while there is a policy imperative for procurement procedures, public entities often experience difficulties in forging and sustaining inter-entities relationships in the form of purchasing (Loeb, 2013). While they appreciate the presence of barriers to procurement public procurement collaborative, they fail to establish the extent of compliance, challenges of compliance and effect of compliance with public procurement procedures (Otieno, 2014). Further, studies indicate dissatisfaction among stakeholders brought about by loopholes left by the Regulations which may be used by dishonest people to make the process inefficient (Kenyanya, 2011). The legal framework for public procurement includes; Public Procurement and Asset Disposal Act, 2015, Public Procurement and Disposal Regulations (2006), Public Private Partnerships (2009), Supplies Practitioners Management Act (2007) and National case-law. Adherence to public procurement procedures is critical to ensure that public funds are used in the best possible way (Gichuhi, 2011). There must therefore be a sound enforcement mechanism that ensures procuring entities comply with the regulations (Loeb, 2013). From the Act, the Public Procurement Regulatory Authority (PPRA) has the functions that include: Ensuring the procurement procedures established under the Act and the subsequent regulations are complied with; Monitoring and reporting on the overall functioning of the public procurement system; Assisting in the implementation and operationalisation of the public procurement system by amongst others preparing and distributing manuals and standard documents to be used in connection with procurement by public entities; providing technical advice and assistance to procuring entities; and developing, promoting and supporting the training and professional development of persons involved in procurement (Ochieng and Muehle, 2012). According to Baily et al, (2010), decisions of the national courts provide interpretation of the requirements of the Act and Regulations and can establish precedents that must be observed. By its very nature, case-law is constantly evolving and has significant effects. The legal framework is constantly evolving through new or amended legislation (Boadway & Bruce, 2011). All procuring entities should therefore ensure that their procurement staff constantly keeps abreast of developments in the legal framework and further equipped to meet their legal obligations (KIPPRA, 2009). The PPADA (2015) was established in order to: Maximise economy and efficiency, Promote competition and ensure that competitors are treated fairly, Promote the integrity and fairness of procurement and disposal procedures, Increase transparency,

accountability and public confidence in those procedures, Facilitate the promotion of local industry and economic development (Ngugi & Mugo, 2011). In order to achieve these objectives, the PPAD Act establishes procurement and assets disposal procedures. It also sets up the necessary structures and policies to ensure that the procedures are followed and to provide oversight and compliance. Procurement policies and procedures must comply with accessibility criteria which may be mandated by the Government from time to time (Kimalu, 2002). Ngunyi (2014) found out that the performance of supply chain was being influenced by quality of service, supplier management, supplier relationship, supplier selection, time service delivered and the internal assessment of criticality of business activities. Dawe (2004) points that, for effective SCM, a comprehensive effort for improvement in all of supply chain functions within a firm should be made, and, first of all, the focus of supply chain practices should shift from functional and independent to general and integrative. This implies that the performance of each supply chain practice should be evaluated depending on how the practice has a significant effect on the efficient integration of entire supply chain processes, and thus, the successful achievement of SC integration can be possible by the systematic utilization of various supply chain practices.

Environmental Uncertainties in Supply Chain Management

Environmental uncertainty refers to the environmental issues in the product chain (Dwivedi and Butcher, 2009). Ngugi & Mugo (2011) described this as the unexpected changes of customer, supplier, competitor, and technology. It was said by Yusuf (2014) that government support plays an important role for business success. Paulraj and Chen (2007a) mentioned that environmental uncertainty is an important factor in the realization of strategic supply management plans. The increase of outsourcing activities in the industry had augmented the awareness of the importance of strategic supply management, which leads to better relationship among organizations. Under this factor, three sub-factors were identified: environment, government support, and uncertainty aspects from overseas (Larson, 2014). This sub-factor is related to the company's relationship with suppliers and their level of trust and commitment (Davis, 2014). Company environment is also related to the company's expectations of quality, on time delivery, competition in the sector, and the level of rivalry among firms. In order to respond effectively to demand, companies realize that imports are a good option for obtaining flexibility in response, even though working with countries from overseas implies working with uncertainty (Adebayo, 2012). According to a study carried out by Ambrose et al. (2010), uncertainty negatively affects company performance. But this can be reduced if a strategic relationship with critical suppliers is established (Drayer, 2014). Thus, companies need to implement new strategies that allow them to deal with environmental uncertainties in the supply chain (Wu, 2006) in order to perform in a proficient manner. Melinda, (2010) observed that the level of support that the company receives from the government when importing raw materials or products from overseas or using domestic materials. It includes the use of norms, regulations, policies, and advice for the sector. The research conducted by Elzarka *et al.,* (2011) describes how government can make a series of reforms to encourage exports by increasing manufacturing sector's competitiveness in the international market through logistics competency. The increase of international trade for acquiring resources from other countries introduces complicated matters such as language barriers, transportation, transportation costs, exchange rates, tariffs, and administrative practices (Quayle, 2006). When

requiring the outsourcing of raw materials or products, it is important to acknowledge the existence of environmental factors such as political uncertainties in other countries that can increase risk for suppliers, provoke decisions of no investment, change business strategies, and in general influence business decisions (Bized, 2011). Social uncertainties such as religion, environment, language, cultural issues, limitations of communication (Bhattacharyya *et al.,* 2010) and also the technology used in other countries might interfere with supply chain planning and function (Johnson, 2012).

Performance of Supply Chain Management Strategies

A supply chain strategy defines how an organization should operate in order to remain competitive in its area of operation. A supply chain strategy seeks to evaluate the cost benefit tradeoffs of the operational activities. A supply chain strategy is owned by the top management. This leads to shared ownership of problems and solutions. Performance of the supply chain management strategy has become a way of improving competitiveness by reducing the uncertainties and enhancing customer care. Supply chain provides actual operations of an organization and supports the organizational business strategy (Happek, 2011). Mentzer (2001) defines supply chain management as the systematic strategic coordination of the traditional business functions within a particular company and across businesses within the supply chain. Supply chain management has evolved from a commercial orientation into a proactive strategic outlook fully integrated into the corporate strategy of the organization. He further notes that Supply chain management is enjoying an increasing economic importance because brought in components are accounting for the largest share of the total organization economy. The connections and nodes in a Supply Chain achieve functions that contribute to the value of the goods transporting through the chain and thus its achievement. Any connection that does not carry out well reduces the overall effectiveness of the whole Supply Chain (Ross, 2014). The notion of Supply Chain Management as used in many researches are usually linked with the globalization of producing and the penchant for manufacturers to source their inputs planetary, which necessitates management of profitable ways of regulating worldwide flows of inputs or outputs. The principal focus of market competition in such situations is not only between goods, but between the Supply Chains delivering the goods (Fredendall & Hill, 2011; Roth & Miller, 2010). As competition in international markets is progressively dependent upon the arrival on time of goods as well as their quality, coordination between suppliers and distributors has become an important characteristic of the Supply Chain. As the customer satisfaction is a crucial benchmark of the success of the Supply Chain, effective management of the linking processes is crucial (Ross, 2014). This supply management concept has evolved over the years from being simply a focus on purchasing to encompassing other related areas including the ultimate supply to the end users (Reck, & Long, 2014). Kopczak and Johnson (2013) observed that there are many views of Supply Chain Management and some are quite elaborate and focus on operations and others on information management. Burt et al. (2012) in their analysis of the growing importance of SCM suggested that a future focus would be on 'Kaizen' or continuous improvement, because this is being recognised as one of the core functions of corporate importance. Supply Chain Management involves proactively managing the two way movement and coordination of goods, services, information and funds from raw material to end user (Lysons, 2011). Supply Chain Management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is

produced and distributed in the right quantity and quality, to the right locations and at the right time, in order to minimize system-wide costs while satisfying service level agreements (SLA). Supply chains are composed of interrelated activities that are internal and external to a firm (Simchi-Levi et al, 2010). Additionally, market uncertainty necessitates Supply Chains to be easily flexible to changes in the situation of trade. Such flexibility in supply requires effective Supply Chain Management (SCM). According to Njuguna (2013), Supply Chain Management refers to corporate business processes integration from end users through suppliers that provide information, goods, and services that add value for customers. Supply Chain can be summed up as a series of interconnected activities which are concerned with planning, coordinating and controlling materials, parts and finished products from supplier to customer (Cunningham, 2010). The key success of SCM will rely on the incorporation of the activities of the supply chain, meaning cooperation, information sharing and organization throughout the entire supply chain (Ross, 2014). For instance; the supply chain in the oil industry is considered a complex one where there exists a linkage between upstream suppliers, downstream distributors, information capital and flow through the chain (Roth & Miller, 2010).

METHODOLOGY

The study adopted and employed descriptive survey design which according to Mugenda and Mugenda (2009) determines and reports the way things are. The target population was 400 from all the National Government ministries in current Kenya government which totaled to 20. The study considered the 20 ministries since they facilitated execution of public services through their respective public enterprises to the Kenyan general public. The study used a simple random sampling technique to select samples from departments in each of the 20 ministries. Questionnaires were used as data collection instruments. Both primary and secondary sources of data was adopted and applied accordingly. The SPSS (version 23) processor processed and released results which were expected to be qualitative in nature.

The regression model for this study took the form:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$

Where:

β_0 = Constant or intercept which is the value of dependent variable when all the independent variables are zero.

β_{1-4}= Regression coefficient for each independent variable.

X_1 =Information Technology

X_2 = Supply chain relationships

X_3=Regulatory framework

X_4=Environmental uncertainties

Y =Supply Chain Management Strategies

ε= Stochastic or disturbance term or error term.

RESULTS AND DISCUSSION

Information Technology

Enterprise resource planning (ERP) system: The study sought to examine the extent to which the Enterprise Resource Planning (ERP) was used by the ministry in the management of its supply chain. The findings showed that the ministries used Enterprise Resource Planning (ERP) Systems by a mean of 4.08 and a standard deviation of 1.164. This implied that ERP was used by the ministry in supply chain management in the IFMIS system. This finding was in line with Towill (2012), who suggested that companies are investing heavily in a variety of software.

Warehouse management system (WMS): The study sought to examine the extent to which the warehouse management system was used by the ministry in the management of its supply chain. The

findings indicated that the ministries used warehouse management system as by a mean of 1.66 and a standard deviation of 0.651. This implied that the use of warehouse management system by the ministries led to efficiency and cost saving. The findings were in agreement with Towill (2012), who said that most of the investment is targeted at Warehouse Management Systems.

Transportation Management Systems (TMS): The study sought to examine the extent to which the transportation management system is used by the ministry in the management of its supply chain. The findings as indicated that the ministries used transportation management system by a mean of 1.83 and a standard deviation of 0.717. This implied that transport management system used by the ministry led to increase in expenses. This was in connection of what Quayle, (2011) said that the increase of international trade for acquiring resources from other countries introduces complicated matters such as language barriers, transportation, transportation costs, exchange rates, tariffs, and administrative practices among others.

Advanced Planning and Scheduling (APS) systems: The question sought to examine the extent to which the advanced planning and scheduling systems are used by the ministry in the management of its supply chain. The findings showed that the ministries use Advanced Planning and Scheduling (APS) system by a mean of 2.50 and a standard deviation of 1.243. The findings of the study are in line with Towill (2012), who said that companies were investing heavily in advanced planning and scheduling system to easing their operations.

Computer-Assisted Ordering Systems: The question sought to examine the extent to which the advanced planning scheduling systems are used by the ministry in the management of its supply chain. The findings indicated that the ministries use computer-Assisted Ordering system by a mean of 2.50 and a standard deviation of 0.674. The findings of the study were in line with Mannem and Gudivada (2014), who said that companies are investing heavily on amomg others advanced planning and scheduling (APS) systems, satellite tracking systems, computer-assisted ordering systems, database management and mining, electronic data interchange (EDI), intranets and extranets, point of sales tracking systems, and Web-based catalogues.

Database Management and Mining: The study sought to examine the extent to which the advanced planning scheduling systems are used by the ministry in the management of its supply chain. The question sought to examine the extent to which the advanced planning scheduling systems. The findings indicated that the ministries used database management system by a mean of 2.58 and a standard deviation of 0.792. The findings of the study were in line with Mannem and Gudivada (2014), who said that companies are investing heavily on ammo others, database management and mining, electronic data interchange (EDI), intranets and extranets, point of sales tracking systems, and Web-based catalogues.

Electronic Data Interchange (EDI): The study sought to examine the extent to which the Electronic Data Interchange (EDI). The findings indicated that the ministries used Electronic Data Interchange (EDI) by a mean of 3.00 and a standard deviation of 1.044. The study also established that the information technology that was also evident include database management and mining (M=2.58, SD=0.792), and Computer-Assisted Ordering Systems (M=2.5, SD=0.674). The findings of the study are in line with Mannem and Gudivada (2014), who said that companies are investing heavily on Electronic Data Interchange (EDI), intranets and extranets, point of sales tracking systems, and Web-based catalogues.

Point Of Sales Tracking Systems: The study sought to examine the extent to which the point of sales tracking systems was used by the ministry in the management of its supply chain. The study established that Electronic Data Interchange (EDI) was evident in the ministry by a mean of 3.00 and a standard deviation of 1.044. The findings were in agreement with the findings of Upton & McAfee, (2012) that Information systems are used to eliminate uncertainty, reduce inventory, and increase responsiveness to customer requests. Some of the important roles identified in the new information technologies are automated order placement, electronic funds transfer payment, facility location, stock keeping unit management, shipment consolidation, point of sales data capture, shipment tracking.

Influence of information technology

The study sought to find out the influence of information technology on supply chain management strategies. The respondents, as illustrated in table 1 agreed that information technology led to increased customer service levels as shown by a mean of 4.00 and a standard deviation of 0.852. It was also established that information technology led to increased performance of the organization (M=3.83, SD=0.577) and reduced supply chain costs (M=3.83, SD=0.717). Further findings indicated that IT led to increased flexibility towards the customer demands as shown by a mean of 3.75 and a standard deviation of 0.753. Information technology also leads to increased inventory control (M=3.66, SD=0.492) and increased timely deliveries (M=3.66, SD=1.073). The findings were in agreement with the findings of Upton & McAfee, (2012) that Information systems are used to eliminate uncertainty, reduce inventory, and increase responsiveness to customer requests. Some of the important roles identified in the new information technologies are automated order placement, electronic funds transfer payment, facility location, stock keeping unit management, shipment consolidation, point of sales data capture, shipment tracking.

Table 1: Influence of information technology on supply chain management strategies

	Mean	Std. Deviation
Increased inventory control	3.66	0.492
Increased performance of the organization	3.83	0.577
Reduced supply chain costs	3.83	0.717
Increased customer service levels	4.00	0.852
Increased flexibility towards the customer demands	3.75	0.753
Increased timely deliveries	3.66	1.073
Reduced time in servicing the public	3.58	0.668

The study sought to examine the extent of Influence of information technology on supply chain management strategies. Respondents indicated the effects of information technology in supply chain management to include: increased inventory control, improving performance of the organization, reduced supply chain costs, improving supplier service levels and timely delivery and reduced time in serving the public. This implies that information technology leads to efficiency in service delivery. The findings are in agreement with the findings of Upton & McAfee, (2012) that Information systems are used to eliminate uncertainty, reduce inventory, and increase responsiveness to customer requests. Some of the important roles identified in the new information technologies are automated order placement, electronic funds transfer payment, facility location, stock keeping unit management,

shipment consolidation, point of sales data capture, shipment tracking.

Supply Chain Relationships

Opportunities to increase revenue and stakeholder value: The study sought to find out what were concerned with the role of supply chain relationships on performance of supply chain management strategies in the national government ministries. Respondents indicated that supply chain relationship led to increased opportunities to increase revenue and stakeholder value (M = 3.91, SD = 0.688). This implied that the respondents agreed supply chain led to more integration and satisfaction from bridging the hidden gaps in teamwork.

Increased user satisfaction from better product or service quality and delivery: The study established that supply chain relationship led to increased customer satisfaction from better product/service quality and delivery. From the findings majority (M = 4.16, SD = 0.577) agreed that supply chain relationship increase satisfaction to users in the departments. The respondents also agreed that opportunities to increase revenue and stakeholder value by the mean of 3.91 and a standard deviation of 0.688. This implied that the respondents agreed to the supply chain relationships for it adds value and quality to products and services in the ministries.

Reduced administration costs: The study established that the respondents agreed supply chain relationship led to reduced administration cost. From the findings majority (M = 3.83, SD = 0.834) agreed that supply chain relationship reduced administration cost and hence increased competitiveness their operations. This implied that the respondents agreed to the idea that the supply chain relationships contributed to the performance of supply chain management strategies in the national government ministries in Kenya. The findings were in agreement with the findings of Nyamasege and Biraori (2015) further noted that supplier involvement in product development allowed firm to make better use of their supplier's capabilities and technology to deliver competitive products at reduced costs.

Integration and satisfaction (Continuity Risk): The study established that the respondents indicated supply chain relationship led to more integration and satisfaction from bridging the hidden gaps in team work (continuity risk**)**. Majority (M = 3.91, SD = 0.9) of the respondents agreed that there was more integration and satisfaction from bridging the hidden gaps in teamwork.

Building joint capability to seize future business opportunities: According to the study result as the respondents indicated that supply chain relationship led to building joint capability to seize future business opportunities (M = 3.75, SD = 0.753). Further findings indicated that the respondents agreed supply chain relationship led to building joint capability by a mean of 3.75 and a standard deviation of 0.753. This implied that building joint capability to seize future business opportunities was one of the components of supply chain relationships goals. The findings were in agreement with Andrew and Linda, (2010), who said that Supply chain relationship performance assessment should create clear joint understanding that empowers supply Chain RMs to fix the problems, monitor and sustain forward momentum and enter a virtuous circle of continuous, improvement. The result must allow the joint teams to focus on quality, innovation, communication, cost reductions, on time delivery, commitment to the future and trust, to achieve satisfied customers and sustained bottom line benefits.

Role of supply chain relationships on performance of strategies in the national government ministries: Respondents indicated that supply chain relationship on performance of strategies in the

national government ministries was valuable**.** This implied that there should be strong supply chain relationships. The findings concur with Fraza (2000) who indicated that Supply Chain Management is directly related to Relationship Management (RM), which includes suppliers and customers. Strategic supplier partnerships and customer relationships are main components in the supply chain management practices, leading to information sharing, which is one of the five pillars in achieving a solid supply chain relationship.

Table 2: Summary of Supply Chain Relationship

Supply Chain Relationships	Mean	Std. Deviation
Opportunities to increase revenue and stakeholder value	3.91	0.688
Increased user department satisfaction from better product/service quality and delivery	4.16	0.577
Reduced administration costs	3.83	0.834
More integration and satisfaction from bridging the hidden gaps in teamwork (Continuity Risk)	3.91	0.900
Building joint capability to seize future business opportunities.	3.75	0.753
Impressing stakeholders with the seriousness of partner intentions	4.16	0.971

Regulatory framework

Transparency and accountability in the supply chain management: The findings indicated that the respondents agreed there were transparency and accountability in the supply chain management by a mean of 3.37 and standard deviation of 0.840. The findings were in agreement with the findings of Ngugi & Mugo (2011) who noted that increased transparency, accountability and public confidence in those procedures, facilitate the promotion of local industry and economic development.

Supply chain performance affects ministry's purchasing cycle time: The findings indicated in table 3 illustrated that the respondents agreed that there was compliance of supply chain performance which affects ministry's purchasing cycle time (M=3.79, SD=0.940). The findings are in agreement with Ngunyi (2014) who found out that the performance of supply chain was being influenced by quality of service, supplier management, supplier relationship, supplier selection, time service delivered and the internal assessment of criticality of business activities.

Table 3: Supply chain performance affects ministry's purchasing cycle time

Statement	**Mean**	**Std. Deviation**
Supply chain performance affects ministry's purchasing cycle time	3.79	0.94

Awareness of procurement regulations affects performance of supply chain: The findings that the respondents also indicated that awareness of procurement regulations affects performance of supply chain by a mean of 4.04 and standard deviation of 0.830. It was also established that there was efficiency in the procurement process in the ministry (M=3.80, SD=0.852).

Compliance of procurement regulations in supply chain management: The findings indicated that the respondents agreed that there was compliance of procurement regulations in supply chain management by a mean of 4.17 and standard

deviation of 0.616. The finding of the study was shown in table 4. The findings were in agreement with the findings of Gichuhi (2011), who noted that adherence to public procurement procedures was critical to ensure that public funds were used in the best possible way. Loeb (2013) also noted that there must therefore be a sound enforcement mechanism that ensures procuring entities comply with the regulations.

Table 4: Compliance of procurement regulations in supply chain management

Statement	Mean	Std. Deviation
There is compliance of procurement regulations in supply chain management	4.17	0.616

There is efficiency in the procurement process in the ministry: The findings showed that the respondents agreed that there was efficiency in the procurement process in the ministry by a mean of 3.80 and standard deviation of 0.852. The findings were in agreement with the findings of Dawe (2004) who noted that, for effective SCM, a comprehensive effort for improvement in all of supply chain functions within a firm should be made, and, first of all, the focus of supply chain practices should shift from functional and independent to general and integrative.

Procurement procedures are followed to the letter in the ministry: The findings indicated that the respondents agreed that there is compliance of procurement regulations in supply chain management as shown by a mean of 3.59 and standard deviation of 0.965. The findings were in agreement with the findings of Gichuhi (2011) who said that adherence to public procurement procedures is critical to ensure that public funds are used in the best possible way and this ensures a sound enforcement mechanism that ensures procuring entities comply with the regulations.

The procurement policies in the department are up to date: The findings indicated in table6 illustrated that the respondents agreed the procurement policies in the department are up to date as shown by a mean of 3.21 and standard deviation of 0.981. The findings were in agreement with the findings of Kimalu (2002) who said that in order to achieve these objectives, the PPAD Act established procurement and assets disposal procedures. It also sets up the necessary structures and policies to ensure that the procedures are followed and to provide oversight and compliance.

Table 5: The procurement policies in the department are up to date

Statement	Mean	Std. Deviation
The procurement policies in the department are up to date	3.21	0.981

The role of regulatory framework on performance of supply chain management strategies in the national government ministries: The findings indicated in table 6 illustrated the respondents agreed that the role of regulatory framework on performance of supply chain management strategies in the national government ministries is cordial. Adherence to public procurement procedures is critical to ensure that public funds are used in the best possible way (Gichuhi, 2011).

Table6: Summary of Regulatory framework

Statement	Mean	Std. Deviation
There is transparency and accountability in the supply chain management	3.37	0.84

Supply chain performance affects ministry's purchasing cycle time	3.79	0.94
Awareness of procurement regulations affects performance of supply chain	4.04	0.83
There is compliance of procurement regulations in supply chain management	4.17	0.616
There is efficiency in the procurement process in the ministry	3.8	0.852
Procurement procedures are followed to the letter in the ministry	3.59	0.965
The procurement policies in the department are up to date	3.21	0.981

Environmental Uncertainties

The ministry selects the suppliers based on their flexibility: According to the findings shown in table 6, the respondents agreed to a large extent that the ministry select the suppliers based on their flexibility (responsiveness) as shown by a mean of 3.96 and a standard deviation of 0.824. The respondents also agreed that the ministry use flexible contracts (backup agreements, quantity-flexible contracts) as shown by a mean of 3.93 and a standard deviation of 0.913. The findings are in agreement by Bergeron (2004), who asserted that enterprises are today faced with complex task and uncertain competitive environments. The finding concurs with Towill (2012) sentiment that to survive, let alone win, a company must be part of one or more supply chains producing world class performance.

Table 7: Selecting suppliers based on their flexibility

Environmental Uncertainties	Mean	Std. Deviation
Selecting suppliers based on their flexibility (slack capacity, responsiveness)	3.96	0.824

The ministry use flexible contracts (backup agreements, quantity-flexible contracts): According to the findings the respondents agreed to a large extent that the ministry selected the suppliers based on the use of flexible contracts (backup agreements, quantity-flexible contracts) by a mean of 3.93 and a standard deviation of 0.913. The findings were in agreement by Bergeron (2004), who asserted that enterprises were today faced with complex task and uncertain competitive environments.

The ministry use e-market places to search alternative suppliers: According to the findings shown in table 8, the respondents agreed to a large extent that that the ministry use e-marketplaces to search alternative suppliers as shown by a small mean of 2.42 and a standard deviation of 0.613. The finding concurs with Towill (2012) sentiment that to survive, let alone win, a company must be part of one or more supply chains producing world class performance.

Table 8: Ministries use e-marketplaces to search alternative suppliers

Environmental Uncertainties	Mean	Std. Deviation
Ministries use e-marketplaces to search alternative suppliers.	2.42	0.613

The ministry use Information Technology planning tools: According to the findings, the respondents agreed to a large extent that the ministry used information technology planning tools as supported by a mean of 3.95 and a standard deviation of 0.712. The findings were in agreement by Bergeron (2004), who asserted that enterprises are today faced with complex task and uncertain competitive environments.

The ministry use inventory buffers: According to the findings shown in table 9, the respondents agreed to a large extent that the ministry use inventory buffers as shown by a mean of 3.74 and a

standard deviation of 0.768. The findings are in agreement by Bergeron (2004), who asserted that enterprises are today faced with complex task and uncertain competitive environments.

Table 9: Ministries use inventory buffers

Environmental Uncertainties	Mean	Std. Deviation
Ministries use inventory buffers	3.74	0.768

Demand, supply and manufacturing uncertainties: Majority of the respondents agreed to a large extent that there existed demand**,** supply and manufacturing uncertainties in the ministries supply chain. The annual procurement plans to cater for demands in the ministries. Early supplier involvement would cater for uncertainty in supply and ensured continuous production; there should be a buffer stock at the ministries warehouses to avoid shortages of essential products. This was in agreement with the findings of Nyamasege and Biraori, (2015) who noted that supplier involvement in product development allows firm to make better use of their supplier's capabilities and technology to deliver competitive products.

Effect of environmental uncertainties on performance of supply chain management strategies in the national government ministries: According to the study result as illustrated in table 10, majority of the respondents agreed to a large extent that environmental uncertainties affected the performance of supply chain management strategies in the national government ministries. These were issues concerning political, economic, socio-cultural, technological, legal, ethical and ecological factors that affect the performance of supply chain management strategies in the national government ministries. The rate of price fluctuations necessitated by these external environmental factors affects the planning or budgeting. The findings of the study corroborates with Paulraj and Chen (2007a) who mentioned that environmental uncertainty is an important factor in the realization of strategic supply management plans.

Table 10: Summary of Environmental Uncertainties

Statement	Mean	Std. Deviation
The ministry select the suppliers based on their flexibility (slack capacity, responsiveness	3.96	0.824
The ministry use flexible contracts (backup agreements, quantity-flexible contracts)	3.93	0.913
The ministry use e-marketplaces to search alternative suppliers.	2.42	0.613
The ministry use Information Technology planning tools (Supply Chain Planning, Suppliers Relationship Management)	3.95	0.712
The ministry use inventory buffers	3.74	0.768

Performance of Supply Chain Management Strategies

Information technology leads to cost reduction: According to the findings, the respondents agreed to a large extent that Information technology leads to cost reduction by a mean of 4.07 and a standard deviation of 1.051. The results are in agreement with Schneider (2012), who said that the use of information technology allows suppliers, manufacturers, distributors, retailers, and customers to reduce lead time, paperwork, and

other unnecessary activities which leads to cost reduction.

Information technology reduces procedure lead times: The study established that how information technology reduces procurement procedure lead times. The findings were as indicated in table11 below. The respondents agreed to a large extent that performance of supply chain strategies can be measured by looking at the extent to which information technology reduced procedure lead times as supported by a mean of 3.78 and a standard deviation of 0.974. The results are in agreement with Schneider (2012), who said that the use of information technology allows suppliers, manufacturers, distributors, retailers, and customers to reduce lead time.

Table 11: Information technology reduces procedure lead times

Statement	Mean	Std. Deviation
Reduced procedure lead times	3.78	0.974

Information technology increases procurement quality: According to the findings, the respondents agreed to a large extent that performance of supply chain strategies can be measured by looking at the extent increased procurement quality by a mean of 4.21 and a standard deviation of 0.878. The respondents also agreed that the ministry use flexible contracts (backup agreements, quantity-flexible contracts) by a mean of 3.93 and a standard deviation of 0.974. The results were in agreement with Talib et al (2011) who found out that supplier participation led to perceived improvements in organizational performance and are associated with improvements in supply chain quality management.

Increased supplier participation and competitiveness: According to the findings, the respondents agreed to a large extent that performance of supply chain strategies can be measured by looking at the extent increased supplier participation and competitiveness by a mean of 3.69 and a standard deviation of 0.898. The results were in agreement with Talib et al (2011) who found out that supplier participation led to perceived improvements in organizational performance and are associated with improvements in supply chain quality management which enhances supplier participation and competitiveness in national government ministries.

Table 12: Increased supplier participation and competitiveness

Statement	Mean	Std. Deviation
Increased supplier participation and competitiveness	3.69	0.898

Information technology reduced paper consumption and costs: According to the findings, the respondents agreed to a large extent that performance of supply chain strategies can be measured by looking at the extent of reduced paper consumption and costs as shown by a mean of 4.0 and a standard deviation of 0.756. The results were in agreement with Humphreys et al. (2011) who said that all companies are looking for cost and lead time reductions with the purpose of improving the level of service but also to enhance inter-organizational relationships.

Information technology increased quality and availability of information: According to the findings shown in table 13, the respondents agreed to a large extent that performance of supply chain strategies can be measured by looking at the extent of increased quality and availability of information by a mean of 4.01 and a standard deviation of 1.911. The results are in agreement with Talib et al (2011) who found out that supplier participation led to perceived improvements in organizational performance and are associated with improvements in supply chain quality management.

Table 13: Information technology increased quality and availability of information

Statement	Mean	Std. Deviation
Increased quality and availability of information	4.01	1.911

Information technology reduced errors in order transmission: According to the findings, the respondents agreed to a large extent that performance of supply chain strategies can be measured by looking at the extent of information technology reduced errors in order transmission as shown by a mean of 3.99 and a standard deviation of 0.86.

Information technology reduced inventory: According to the findings shown in table 14, the respondents agreed to a large extent that performance of supply chain strategies could be measured by looking at the extent of information technology reduced inventory by a mean of 3.69 and a standard deviation of 0.898.

Table 14: Information technology reduced inventory

Statement	Mean	Std. Deviation
Reduced inventory	3.69	0.898

Performance of Supply Chain Management Strategies

According to the findings shown in table 15, the respondents agreed to a large extent that performance of supply chain strategies by extent of cost reduction with a mean of 4.07 and a standard deviation of 1.051, reduced procedure lead time (M=3.78, SD = .974), Increased quality (M=4.21, SD=.875). Increased supplier participation and competitiveness (M=3.69 and SD=0.898). Reduced paper consumption and costs (M=4.00 and SD=0.756). Increased quality and availability of information (M=4.01 and SD=1.911). Reduced errors in order transmission (M=3.99 and SD=0.860) and reduced inventory (M=3.69 and SD= 0.898).

The result was in agreement with Handfield (2009) that there were a number of reasons for measuring procurement and supply chain strategies and performance such as; support better decision making that made performance and results visible.

Table 15: Performance of Supply Chain Management Strategies

Statement	Mean	Std. Deviation
Leads to cost reduction	4.07	1.051
Reduced procedure lead times	3.78	0.974
Increased procurement quality	4.21	0.875
Increased supplier participation and competitiveness	3.69	0.898
Reduced paper consumption and costs	4.00	0.756
Increased quality and availability of information	4.01	1.911
Reduced errors in order transmission	3.99	0.860
Reduced inventory	3.69	0.898

Multiple Regression Analysis

This study examined the factors influencing performance of supply chain management strategies in the national government ministries in Kenya. The data resulting from scoring of the instrument and coding were subjected to multiple regression analysis to test the hypotheses below.

Ho: The contribution of combined factors (information technology, supply chain relationships, regulatory framework and environmental uncertainties) is not significant in prediction of performance of supply chain strategies. The results presented in Table 16.

Table: 16: Regression Results

	Unstandardized Coefficients		**Standardized Coefficients**	**T Values**	**T Critical**	**Significance**
	Beta	Std. Error	Beta			
(Constant)	3.221	6.20		7.358	1.660	0.037
Information technology	1.24	1.233	0.365	0.912	1.660	0.028
Supply chain relationships	1.31	1.435	0.96	1.246	1.660	0.030
Regulatory framework	1.42	1.336	0.97	0.949	1.660	0.024
Environmental uncertainties	1.33	1.27	0.787	0.776	1.660	0.031

According to the regression equation established, taking all the factors to be zero (information technology, supply chain relationships, regulatory framework and environmental uncertainties), performance of supply chain management strategies in the national government ministries was 3.221. The Standardized Beta Coefficients give a measure of the contribution of each variable to the model. A large value indicated that a unit change in this predictor variable had a large effect on the criterion variable. The t and Sig (p) values give a rough indication of the impact of each predictor variable – a big absolute t value and small p value suggested that a predictor variable was having a large impact on the criterion variable.

At 5% level of significance and 95% level of confidence, information technology had a beta coefficient of 1.24, supply chain relationships had a beta coefficient of 1.31, regulatory framework had a beta coefficient of 1.42 and environmental uncertainties had a beta coefficient of 1.33. The Beta coefficients indicate the extent to which performance of supply chain management strategies in the national government ministries change due to a unit change in the independent variables. The positive Beta coefficients indicate that a unit change in the independent variable leads to a positive change in performance of supply chain management strategies. Hence the regression with Beta values is shown below;

$$Y = 3.221 + 1.24X_1 + 1.31X_2 + 1.42X_3 + 1.33X_4 + \varepsilon$$

Regression Model Summary

The results in Table 16 below show that the value obtained for R, which was the model correlation coefficient was r = 0 .865434 which was higher than any zero order value in the table. This indicated that the model improved when more variables were incorporated when trying to analyze performance of supply chain strategies. The model showed a goodness of fit as indicated by the coefficient of determination (R^2) with a value of 0.748976. This implies that the independent variables: information technology, supply chain relationships, regulatory framework and environmental uncertainties explains 75% of the variations of performance of supply chain strategies. The remaining 21% is determined by others factors not considered in the study. The statistical F test is used to determine how well the regression equation fits the data. In this study, the F value of 56.516 was significant at the 5% level, indicating the independent variables helped to explain some of the variation in performance of supply chain strategies. ANOVA results indicate that the overall model was significant, that is, the independent variables were good joint explanatory variables of performance of supply chain strategies.

Table 17: Regression Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.865434	0.748976	0.754786	0.8143

Predictors: (Constant), information technology, supply chain relationships, regulatory framework and environmental uncertainties.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings the ministries use Enterprise Resource Planning (ERP) Systems. The study also established that Electronic Data Interchange (EDI) was evident in the ministry. The information technology that was also evident included database management and mining, Advanced Planning and Scheduling (APS) system and Computer-Assisted Ordering Systems. The study also sought to find out the influence of information technology on supply chain management strategies. The respondents agreed that information technology led to increased customer service levels. It was also established that information technology led to increased performance of the organization and reduced supply chain costs.

Further findings indicated that IT led to increased flexibility towards the customer demands. Information technology also led to increased inventory control and increased timely deliveries. According to the analysis, the respondents indicated that supply chain relationship leads to increased customer satisfaction from better product/service quality and delivery. It was also evident that supply chain relationship played a role in impressing stakeholders with the seriousness of partner intentions. The respondents also agreed to opportunities to increase revenue and stakeholder values. Further findings indicated that the respondents agreed supply chain leads to more integration and satisfaction from bridging the hidden gaps in teamwork.

The third objective of the study sought to find out the influence of regulatory framework on the performance of supply chain management strategies in the national government ministries in Kenya. The findings indicated that the respondents

agreed that there is compliance of procurement regulations in supply chain management. The respondents also indicated that awareness of procurement regulations affects performance of supply chain. It was also established that there is efficiency in the procurement process in the ministry and that supply chain performance affects ministry's purchasing cycle time.

The fourth objective of the study was to determine the influence of environmental uncertainties on performance of supply chain management strategies. The respondents agreed to a large extent that the ministry selected the suppliers based on their flexibility (slack capacity, responsiveness. Further findings indicated that the ministry used information technology planning tools. The respondents also agreed that the ministry used flexible contracts (backup agreements, quantity-flexible contracts). It was important to note that the respondents indicated to a small extent that the ministry use e-marketplaces to search alternative suppliers. In order to measure performance of supply chain strategies, the respondents were given statements to rate on a five point likert scale where; 1- Very small extent, 2- small extent, 3- moderate, 4- large extent and 5- very large extent. The findings indicated that performance of supply chain strategies was measured by looking at the extent of procurement quality, cost reduction, quality and availability of information, reduced paper consumption and costs and reduced errors in order transmission.

Conclusions

The study concluded that information in supply chain was an important factor for favorable and optimal decision for development and survival. Considering the importance of information in the supply chain, the study also concludes that the cause of poor efficiency in the supply chain, are the lack of accuracy and adequacy in information systems that are responsible for providing and processing of the information. The research results showed that information sharing was associated with supply chain strategy but had more relationship with responsiveness of supply chain. The study concluded that strong partnerships are critical to successful supply chain management. Successful supply chain relationships also require supervision of suppliers, development of compatible technical capabilities, and sharing information intensively and selectively. However, good results often can be achieved without investing in extra human resources to form tight relationships with every supplier.

The findings indicated that the respondents agreed there was compliance of procurement regulations in supply chain management. The respondents also indicated that awareness of procurement regulations affects performance of supply chain. It was also established that there is efficiency in the procurement process in the ministry and that supply chain performance affects ministry's purchasing cycle time. Adherence to public procurement procedures is critical to ensure that public funds are used in the best possible way. Therefore, there must be a sound enforcement mechanism that ensures procuring entities comply with the regulations.

From the above findings it was concluded that officers participate in tendering processes. Public entities comply with the public procurement procedures. procurement entities applies appropriate procurement methods for appropriate threshold in procurement and that procurement staff are qualified and experienced to handle procurement processes. These were found to influence the supply chain performance in the national government ministries. Coordination with environmental changes to meet the demands of customers is very important, information sharing leads to higher level of information exchange

between the respective ministries and suppliers for high effectiveness of information. The relationship between supply chain strategies (responsiveness and efficiency) and performance has also been approved.

Recommendations of the study

The study recommends that supply chain professionals in the government ministries embrace collaborative relationships with their suppliers so as to optimize their supply chain costs. This can be through establishing clear communication networks, joint risk assessment and management and having strategic supplier partnerships with their key suppliers. Government ministries should also establish trustworthy suppliers to ensure commitment and credibility in transactions. Technology was viewed as one of the failures in achieving supply chain performance and indications from the findings of its crucial role in the implementation suggest that government ministries should also invest in technology not only in their departments but also in partnership with suppliers so as to streamline operations in the supply chain.

It was important to offer ethics education to ministries tender committee Members in order to ensure they serve in ultimate objectivity, accountability, and non-discrimination. The organization code of ethics should be well put in place and adhered to; in order to guide the daily operations of tender committee and to provide them with guiding principles. On the extent of compliance with public procurement procedures, building the capacity of service providers has been identified as one of the success factors of public procurement reforms. It is important that Public Procurement Regulatory Authority (PPRA) organizes training sessions for contractors, surveyors, architects, consultants and suppliers in the private sector on tendering processes and on appeals, complaints and dispute solving mechanism. The research results suggest not only the importance of improving overall supplier relations, but also the particular benefits of building partnerships within the supply chain through co-operation and long-term commitment in order to increase satisfaction with overall supplier performance.

Suggestion for Further Research

Further Research on effect of Information and Communications Technology (ICT) on performance of supply chain strategies should be investigated since from the findings ICT possibilities have been insufficiently used in achieving supply chain performance.

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