A STUDY OF SUPPLY CHAIN MANAGEMENT PRACTICES AT THE UNIVERSITY OF NAIROBI

BY

NGARI ANNE WANJIKU

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DECLARATION

I hereby declare that the work contained in this project is my original work, and has not previously in its entirety or in part been presented in any other university for a degree.

..... Date 04/12/2008

Ngari Anne Wanjiku

Reg. No. D61/7867/2006

SUPERVISOR:

This project has been submitted with our approval as the university supervisors

..... ***Date*** 4/12/08

DR. W. N. IRAKI

Department of Management Science

DEDICATION

To my husband Kimani Joseph, my children Elsie Clare Njeri and Brandon Muchina for the love, care, patience, guidance and continuous encouragement. Your support I cannot measure.

To my loving dad, Ngari wa Gathindi, for instilling in me the value of education, I am proud of you.

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ABSTRACT

Supply chain management (SCM) practices have emerged in the last decade as a strategic option to meet new challenges in global business environment. SCM seeks to enhance competitive performance by closely integrating the internal functions within a company and effectively linking them with the external operations of suppliers and channel members.

The objective of this study was to explore the supply chain practices in the current higher education environment with a focus on the University of Nairobi. The focus was on three research questions: What are the supply chain management practices at the University of Nairobi?, What are the potential benefits the University of Nairobi can derive from effective and efficient implementation and use of supply chain management practices? and What are the challenges affecting institutional readiness that are facing the University of Nairobi in the implementation and use of supply chain management practices?.

Questionnaires were use as the data collection method; they helped bring out the results of the study as expected. The results indicated that Supply chain management practices used at the university are mostly those that apply to the procurement philosophy. It emerged that most units' appreciated the need for implementation and use of supply chain practices and hence a need to for the university management to change the current mind set. With respect to benefits which could be derived from implementation and use of supply chain management practices, results indicated that they would open up the university to adapt to changes in the external environment, will results to more a efficient inventory management system and improved customer service due to its customer focused approach and most benefits would not take time to be realized. While, not using Supply chain management practices, lack of adequate resources to facilitate the implementation and use of supply chain management practice and lack employee empowerment currently hinder meaningful progress in supply chain management.

Current study though with some limitations in terms of response and scope has served the purpose of creating a quest for further research on supply chain management practices in an academic setup, which can be used as a basis for further study and benefit to the management of academic institutions.

Keywords: Higher education, Supply chain, Supply chain management, University of Nairobi.

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CHAPTER ONE: INTRODUCTION.

1.1 Background

Supply chain management (SCM) has become a very prominent concern for both large and small organizations as they strive for better quality and higher customer satisfaction (Mentzer et al. 2000; Chopra and Meindle 2001). At the same time, the global marketplace offers significant opportunities for supply chain management. Carter et al. (1995) defines SCM as a coordinated approach for managing the flow of goods from suppliers to ultimate consumers, and that the goal is to meet customer service objectives while minimizing inventory and related costs. Spekman et al. (1998) notes SCM is the process of planning, implementing, and controlling an organization's operations with the purpose to satisfy customer requirements, movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption. Johannson (1994) notes that SCM is an operations approach to procurement. Supply chain management works to bring the supplier, the distributor, and the customer into one cohesive process (Laudon and Laudon, 2001; Youngdahl 2000).

Increasing demands for reduced costs, increased quality, improved customer service and continuity of supply have significantly elevated supply chain management's stature within organizations (Marshall and Locander 2003). Supply chain has become a key element in any organizational corporate strategy. Its impact has been realized through the contribution by the function to overall corporate performance and the fact that a large portion of the organizations budget is spent on supply chain (Gadde and Håkansson, 2001). Mol (2003) found that when the supply function is properly aligned with corporate strategy it can provide capabilities that result in superior performance in the areas of cost, quality, dependability and performance. Effective management must take into account coordinating all the different pieces of this chain as quickly as possible without losing any of the quality or customer satisfaction, while still keeping costs down (Craig 1996; Shin et al. 2000). Therefore, the ultimate success of firm will depend on its managerial ability to integrate and coordinate the supply chain members (Drucker, 1998; Lambert and Cooper, 2000).

Supply chain management continues to be adopted by organizations as the medium for creating and sustaining a competitive advantage (Ireland and Webb, 2007). Thus, it has become more involved in developing and implementing strategies and enjoys a larger role in

formulating corporate strategies. In addition, knowing that the firm's capabilities are limited in time and effort, management will need to choose the level of partnership appropriate for each particular supply chain member (Lambert and Cooper, 2000). Successful integration of the supply activity with what customers demand leads to delivery of high quality products, on time, and at low cost (Cousins and Menguc, 2006; Frohlich and Westbrook, 2001).

1.1.1 Supply chain in the service sector

Supply chain practices are developed in the manufacturing sector. Business in service sector is slow in adopting these principles owing to the nature of the outcome of this business sector (Fitzsimmons and Fitzsimmons, 2004). Higher education systems as a knowledge provider are even slower in adopting these concepts and practices owing to the specific characteristics of the service provided and to the long-lasting culture and values of higher educational institutions. Some of these practices are enforced by accreditation bodies as a pre requirement for accreditation. These practices are major steps in strengthening the supply-demand chain.

However, there are still many lessons to be learned from the manufacturing sector in this regard (Al-Turki et al., 2008). There are several differences between manufacturing and service industries that affect the nature of the customer-supplier relationship. Services can be considered as acting on people's minds, bodies, souls, belongings, or information. Thus, customers supply the 'raw material' resulting in what is called by Fitzsimmons and Fitzsimmons (2004) 'customer-supplier duality' and creating a service supply relationship. Supply chains in service industry are usually very short with a service provider acting as an agent for the customers when dealing with outside suppliers. The resulting relationship is more like a hub than a chain which is much more simple relationship. However, input raw materials usually have high variations in quality, which represent a challenge for service providers. Furthermore, unlike goods, services can not be inventoried which forces service providers to hold excess capacity (Al-Turki et al., 2008).

Based on their review, Mentzer et al. (2001) proposed that supply chain management as a management philosophy should adopt certain characteristics which include: Systems approach to viewing the supply chain as a whole, and to managing the total flow of goods inventory from the supplier to the ultimate customer; Strategic orientation toward cooperative effort to synchronize and converge intra-firm and inter-firm operational and strategic capabilities into a unified whole; and Customer focus to create unique and individualized

sources of customer value, leading to customer satisfaction. Successful implementation of supply chain management has been credited with helping to cut costs, increase technological innovation, increase profitability and productivity, reduce risk and improves organizational competitiveness (Steven, 1989; Mentzer, 2001). Effective supply chain management must take into account coordinating all the different pieces of this chain as quickly as possible without losing any of the quality or customer satisfaction, while still keeping costs down (Craig 1996; Shin et al. 2000).

Therefore, supply chain policies such as procurement and supplier selection have an important role in the SCM (Degraeve et al., 2000). Lean practices to improve the internal processes of an organization in line with the principles of just in time (JIT) supply are other highly recognized practices in SCM (Burgess et al., 2006). Integration of internal processes of the organization with the suppliers and customers forms the essence of the whole idea behind SCM, with the widespread use of internet, web-based systems enable organizations to form strong customer and supplier integration for inventory management, demand forecasting, customer and supplier relationship management (Frohlich and Westbrook, 2002). Ultimately, successful supply chain management aims to reduce the costs of both clients and suppliers, while sustaining or improving added value and margins. Consequently, companies that have effective supply chains are most successful (Childerhouse and Towill, 2000).

1.1.2 Higher Education Institutions.

In the recent years, the need for a renewed focus on higher education institutions has been felt. Universities seek more effective systems to address the increasing dissatisfaction with the performance of higher education systems. In response to the necessisty for reforming higher education system in line with the needs and expectations of the community and the business sector, new approaches and practices in management and industry have appealed to decision makers of higher education (Mizikaci, 2006).

University education in Kenya began in 1963 with just 571 students enrolled in Nairobi University College (Weidman, 1995). Since then, the system has undergone some commendable expansion, and by 1998 there were a total of six public universities and 18 private universities with varying degrees of recognition in the country. In addition to the universities and their constituent campuses, higher education in Kenya also includes

polytechnics, institutes of science and technology and diploma level teacher training colleges (Encyclopedia of Higher Education, 1992).

Like most African countries, higher education in Kenya was historically free, with the public purse covering both tuition and living allowances (Weidman, 1995). The rationale for free higher education in Kenya was based among other things, on the country's desire to create highly trained manpower that could replace the departing colonial administrators. In return, graduates were bound to work in the public sector for a minimum of three years. Among other factors, economic difficulties, and the alarming increase in population, coupled with rising oil prices of 1973 (Cutter, 2001) changed this trend, first resulting in the reduction of the recurrent budget allocated to higher education, and then, paving the way for the introduction of user charges in higher education in Kenya. As a result, there has been a stark decrease in the proportion of the country's national budget allocated to the recurrent expenditure of education (Ogot and Weidman, 1993).

There is no doubt that higher education is facing escalating expectations and demands while at the same time experiencing serious economic shortfalls. This strategic Planning must therefore take cognizance of these challenges and respond to them adequately. The University is therefore compelled to chart a new strategic direction guided by a shared vision, strategic thinking and agility, while at the same time being increasingly aware of the importance of its position in a worldwide context (http://www.uonbi.ac.ke/strategic_docs). While these challenges are many and certainly daunting, management of institutions of higher education need not grope in the dark. Part of the benefit of globalization is the free flow of information and there are plenty of successful and failed reforms around the world that these institutions can learn from. Successful institutions are rather products of insightful, progressive, thoughtful, informed managements' unfaltering efforts. Great institutions are the reward of a society that understands the role of higher education in its civilization, management that is wise to devote resources that will enable its higher education system rank among the best in the world, and a society that is courageous enough not to meddle unwittingly in the affairs of its higher education (Michael, 2004).

Lau (2007) affirms that different from many large business organizations, most universities have no formal supply chain strategies placed publicly. The aims of supply chain management would be suggested by interviewee as "value for money" and

''accountability''. Value for money is to ensure that funding, both public and private, is used intelligently and productively. Accountability is to promote cost-effectiveness in administrative and research area. That means that, keeping academic quality, the university should manage supply chain effectively with cost being an important factor. To maintain substantive academic achievement with limited resources, cost-effectiveness is the goal that the education institution starts to work on. Supply chain management as the mean to achieve the goal in the business field should be appropriate to use in the academic one (Lau, 2007).

1.1.2.1 The University of Nairobi

The University of Nairobi is the oldest and largest University in Kenya. From its humble beginning in 1956 with 215 students, today it has an enrollment of over 36,000. The University offers a diverse range of academic programmes and is organized into 6 Colleges, 3 Faculties, 6 Institutes, 17 Schools and 67 teaching departments. It has the highest concentration of scholars in the country. As the University has grown overtime, it has become a complex entity. It has also had to contend with an ever changing external environment. Resources are dwindling against the background of rising demand for higher education. Public Universities are all competing for scarce Government resources (UoN Strategic plan, 2008-2013).

Various stakeholders are demanding more from the institution than was the case in the past. Continued performance improvement is now a basic requirement. These and other challenges mean the University has to embrace change. Effective response will involve the re-thinking of old assumptions of University education that may have worked well in the past but could trap and immobilize the institution in the future. The University will have to be responsive to those it serves. Customer focus and engagement with society need to be urgently incorporated in its activities (UoN Strategic plan, 2008-2013). The University of Nairobi, by its history and position finds itself with the inherent role of providing leadership in the domain of higher education in Kenya. This role however, has to be fulfilled in the context of changing paradigms. The leadership demanded of the University has to be demonstrated in the context of a global arena. The external environment within which this role has to be performed has changed dramatically and it has acquired an international character. The University of Nairobi must take stock of this new dimension and come to terms with the special challenges and obligations brought about by these changes (UoN Strategic plan, 2008-2013).

1.1.2.1.1 University of Nairobi Procurement Division

The Procurement Division performs various functions which includes, Receiving and processing of requirements from user departments, Coordinating the preparation of annual procurement plans as submitted by the respective departments, Preparation and processing of quotations, Preparation of Tender documents in consultations with the user departments, Advertisements of Tenders, Preparation of letters of award notification and contract agreements as well as the management of contracts, Ordering, follow-up or processing of goods, delivering schedules to user departments and warehouses, Performance of market research and price survey on items and services required by the University, Maintenance of updated suppliers register and files for purposes of performance rating and Preparation of annual tender returns among others (http://www.uonbi.ac.ke as 27/10/2008).

The University procures various items which include, Equipment, Machinery and vehicles, Building and construction services, Computers and computer accessories, Printing services, Stationery, Cleaning materials, Insurance services, Maintenance and repair services, Clearing and forwarding services, Air ticketing and travel services, Security services, Food stuff, Consultancy services, Laboratory supplies and reagents, Uniform, Games equipment and gear, Legal services etc. In assessing suppliers the University lays great emphasis on competence, ability to meet quality standards and delivery targets as well as maximizing value returns on each shilling spent. All tenders go through Technical Evaluation Committees where bidders who meet rigorous technical evaluation are ranked. Minimum requirements, objectivity and fairness are the guiding principles. The University disposes mainly through open tender, unserviceable stores, equipment and supplies (http://www.uonbi.ac.ke as 27/10/2008).

The University of Nairobi has a Procurement Division based at the Central Administration. It is managed by a procurement manager, supported by several officers. The division is represented in the colleges and SWA by college procurement officers. The University of Nairobi is a procuring entity, and as per the regulations, the procurement functions in the University are centralized. However, because of the peculiar nature (i.e. its colleges are situated in different locations far from the main administrative hub) of the University, some procurement is carried out in the colleges with the authority of the principal and in SWA, authority of the Director (UoN staff handbook 2006). However the main procurement point is the University Tender Committee based at the Main Campus. The decisions of the Tender

Committee are implemented by the Procurement Manager who is also the Secretary to the Committee. The University Procurement Annual Budget is slightly over 3 billion (http://www.uonbi.ac.ke as 27/10/2008).

In all sense, procurement department tends to play an active role of purchasing activities to fulfill the customer needs at a reasonable price, which targets at cost effectiveness. The customers are internal, i.e. a student, a researcher, academic and administrative staff, while external suppliers are other business organizations. Internal supply chain activities are the supply chain processes conducted by supply chain department.

1.2 Statement of the problem

In a number of organizations cost-effective supply chain is a matter of survival as purchased goods and services account for upto 80% of their costs, while in the public sector there is an ever increasing demand for savings in the procurement process (Quayle, 2003). The importance of managing buyer-supplier relationships is fundamental for continued organizational success. What is questionable, however, is how the methods used to manage these relationships actually become operationalized in organizations (Mudambi and Schrunder, 1996).

The University of Nairobi has been continuously challenged to be a shining example in the higher education sector by undertaking reforms that ensure efficient and high quality service provision to its clients. In a survey carried out by The Steadman Group in April 2007 on stakeholders perception of the University of Nairobi, suppliers indicated that though their relationship with the university was good there was need to revisit on how suppliers problems/ complaints are handled which they were less satisfied with (http://intranet.uonbi.ac.ke). There are several uncompleted projects spread all over the seven campuses of the University. This is unsightly and has result in escalated contract billing due to interest rates accruing on unpaid bills and breaching of contracts. This adds to the accumulation of the University debts (UoN Strategic plan, 2008-2013). The University of Nairobi has been facing challenges in the acquisition time for transport maintenance and consumables which has a turn around time of 83 days coupled with many work flow steps (30 steps) in the procurement process (UON Varsity focus, December 2007).

The University faces challenges in enacting the Public procurement Act, 2005 and Public procurement and Disposal Regulations, 2006. Currently the university still faces a problem of high procurement costs, where the costs of some items are overstated. There is slow processing of user orders which leads to lack of required items hence delay in delivering the items to the user on time, thus affecting the user's performance and service delivery. The UoN central store has been holding a lot of dead stock which has increased the purchasing costs. The university's transport department, procurement department and the finance department have been having strained relations and there is need for them liaise in their day to day working. To solve these problems the University of Nairobi implemented the rapid results initiative (RRI) as a vehicle to improve service delivery and processes improvement. Since the university aims at continuous improvement, implementing and using effective and efficient supply chain management practices is of essence to the university as away of trying to solve the problems.

Various studies have been done in the past on SCM in Kenya but most of them focused on the commercial entities. They include Rwoti (2005), Mwanyota, (2004), Mwaniki (2005), Okuroh (2007), Musau (2003. All their studies provide valuable insights into SCM in various Kenyan organizations. However, while appreciating the findings of the previous studies, to the best knowledge of this researcher there has been no empirical study that examines SCM practices in the Kenyan higher educational sector. This study, therefore, aimed to establish whether Kenyan education sector (and in particular The University of Nairobi) have realized the important role played by individual suppliers and customers in the supply chain and have seen the need to improve performance and thereby adopting SCM practices.

In line with foregoing discussion and with the understanding much like traditional corporations, the universities and colleges need to see the supply chain management process as an effective area to target for cost savings opportunities (Chase, 2007), this study sought to answer the following questions;

i. What are the supply chain management practices at the University of Nairobi?
ii. What are the potential benefits the University of Nairobi can derive from effective and efficient implementation and use of supply chain management practices?
iii. What are the challenges affecting institutional readiness that are facing the University of Nairobi in the implementation and use of supply chain management practices?

1.3 Objectives of the study.

The primary objectives of this study are:

i. To explore the supply chain management practices at the University of Nairobi.

ii. Establish the benefits the University of Nairobi can derive from implementation and use of supply chain management practices.

iii. Establish the challenges affecting institutional readiness that face the University of Nairobi in the implementation and use of supply chain management practices.

1.4 Importance of the study

The proposed study has a wide implication to various individuals and institutions, including the University of Nairobi, other public universities, academia and practitioners in the supply chain industry. The specific benefits to the various parties outlined include:

i. **University of Nairobi and Academia.**

The University of Nairobi is in the process of implementing its strategic plan and Results Based Management (RBM). Findings of the current study greatly contribute to the process, as they wish to continually improve performance as a basic requirement, these and other challenges mean the University has to embrace change. Also the University of Nairobi staff, who are directly responsible for the supply chain management, to take note of the ineffective and inefficient areas and the extent to which they need to improve their services to be more useful to the organization as a whole.

As noted the area of supply chain management (SCM) has become very popular. Burgess el. al. (2006) observed there appears to be little research that has focused on SCM practices. This has contributed to the existence of a number of gaps in the knowledge base of the field. The findings open up new ideas and further enrich supply chain management as an area of study.

ii. **Industry practitioners and policy makers**

World class organizations globally are gradually adopting supply chain management practices; hence the findings of he current study will boost the understanding of various aspects as to the design and implementation of supply chain management. Particularly, other institutions of higher education stand to greatly benefit from the study findings.

CHAPTER TWO: LITERATURE REVIEW

2.1 Supply chain management an evolving concept

Supply chain management has increasingly been recognized as a key driver of overall operational and financial performance and an emerging subject within operations management research (Pilkington and Fitzgerald, 2006). Mentzer et al. (2000), also notes that SCM has become a very prominent concern for both large and small companies as they strive for better quality and higher customer satisfaction. Soonhong and Mentzer, (2004), emphasizes that supply chain management is one of the most strategic areas of responsibility in the purchasing and supply function in organizations. SCM is an approach to satisfy customer needs for products and services by integrating the business process of the firm with the entire value chain from raw material procurement to the product or service delivery to customers (Lee, 2001). Gadde and Håkansson (2001), states that Supply chain management has become a key element in any organizational corporate strategy. Its impact is driven by the contribution of the supply chain function to overall corporate performance and its interface relationships and the fact that large portion of the budget is spent on supply chain. The ultimate success of firm will depend on its managerial ability to integrate and coordinate the supply chain members (Drucker, 1998; Lambert and Cooper, 2000).

SCM is currently perceived as an effective means to achieving successful international competitiveness (Evans et al., 1996). Worldwide, interest in supply chain management has increased steadily since the 1980s when organizations began to see the benefits of collaborative relationships (Gattorna, 1998). The essence of supply chain management is as a strategic weapon to develop a sustainable competitive advantage by reducing investment without sacrificing customer satisfaction (Lee and Billington, 1992). While reduced cost is typically a result, supply chain management emphasizes leveraging the skills, expertise, and capabilities of the firms who comprise this competitive network referred to (Helper, 1991). Besides, it also represents a paradigm shift that extends one's appreciation for the concepts of co-operation and competition in such a business environment (Best, 1990).

The traditional view of SCM is to leverage the supply chain to achieve the lowest initial purchase prices while assuring supply. In the earlier years, the emphasis was on materials planning, utilizing materials requirements planning techniques, inventory logistics management with one warehouse multi-retailer distribution system, and push and pull

operation techniques for production systems (Chandra and Kumar, 2000). Typical characteristics include: multiple partners; partner evaluations based on purchase price; cost-based information bases; arm's-length negotiations; formal short-term contracts; and centralized purchasing (Spekman et al., 1998). However, Fisher (1997) argued that traditional supply chains are operating on borrowed time. It is no longer simply a matter of pushing products and services toward the customer as efficiently as possible. Instead, the supply chain is becoming pivotal to the success and survival of business as many managers consider the supply chain so crucial to the survival of their business that the future has been nicknamed the supply chain age.

Mentezer (2001) defines SCM as the systematic, strategic, coordination of the traditional business functions within a particular company and across businesses within the supply chain for purposes of the individual companies and the supply chain as a whole. This definition according to burgess (2006) is broad and is not confined to any specific discipline area and it adequately reflects the breath of issues that are usually covered under this term. For instance, Burt et al (2003) found out that SCM mutated first into a commercial orientation with an emphasis on cost saving and then into proactive strategic outlook that is fully integrated into competitive strategy of the company and notes further that SCM is enjoying an increasing economic importance.

SCM constitutes all the activities associated with the design, planning, synthesis, organization, and control of supply chains (Chan et al., 2003). Vakharia (2002), proposed supply chain management (SCM) to be the art and science of creating and accentuating synergistic relationships among the trading partners in supply and distribution channels with the common shared objective of delivering products and services to the "right customer," in the "right quantity," and at the "right time." While, Simchi-Levi et al. (2000) describes SCM as an aggregation of approaches and efforts supporting the efficient consolidation of producers, suppliers and distributors, in effect a co-ordination of the value chain so that products are produced and distributed in the right quantity, at the right quality, at the right time and at the right place to ultimately achieve consumer satisfaction. In addition, supply chain management is the management of information, processes, goods and funds from the earliest supplier to the ultimate customer, including disposal. (Ellram, el. al., 2004) Conceptually, SCM includes all value-adding activities from the extraction of raw materials through the transformation processes and through delivery to the end user. SCM spans

organizational boundaries and treats the organizations within the value chain as a unified virtual business entity (Scott and Westbrook 1991; New and Payne 1995). Baatz (1995) further expanded SCM to include recycling or reuse activities.

Literature on SCM tends to move rather imperceptibly between description, prescription and trend identification. Key trends which have been identified include, most notably, "cooperation" rather than competition, a shift from the "antagonistic" model to a collaborative model (Matthyssens and Van den Bulte, 1994; Carr, 1999), the increasing use of supplier-evaluation tools (Carr, 1999), a trend towards supplier management and so on. While the alleged trends may be similar, different kinds of assessments are sometimes made. Some authors suggest an irresistible trend while others note the relatively limited take up to date (Skjoett-Larsen, 1999; Kemppainen and Vepsalainen, 2003). The underlying claimed "trend" is that supply management consciousness is accelerating up the corporate agenda and there does appear to be some evidence for this. For example, many companies have appointed supply chain directors (Christopher, 1998). Perhaps even more prevalent has been the trend towards the conscious examination and rationalization of supplier networks and the development of "collaborative" or "partnership" relationships between buyers and suppliers (Balakrishan, 2004). Such initiatives have come to be seen as of strategic significance by general managers rather than simply tactical gains by functional specialists (Storey, 2002). Supply chain management works to bring the supplier, the distributor, and the customer into one cohesive process (Laudon and Laudon, 2001; Youngdahl 2000).

Table 2.1: Core concepts of supply chain management

Dimension	Conventional Management	Supply Chain Management
Unit of analysis, focal point of allegiance	Functional, department, or firm as main unit of analysis	Supply pipe line as unit of analysis (materials flow planning; echelons; structures; value chain; network)
Use of information and knowledge	Information denial; lack of transparency	Information & knowledge sharing; transparency
Beneficiaries	One- sided benefit; win-lose	Mutual benefit; win-win
Targets	Optimization; cost reduction; price central	Maximization: Wider set of issues: value creation: quality, service, safety, etc.
Time horizons	Short-term wins; periodic negotiation	Long-term gains; life cycle (total value) costing
Relationship episode	Transactional	Long-term, deeper, multi-faceted relations
Range of "partners"	Multiple competitive sourcing	Single or reduced sourcing
Scope of task	Fragmented tasks; impermeable rigid boundaries; discrete activities	Interdependency; Co-makership; permeable flexible boundaries; overlapping activities.
Connectivity	Independent logistics	Integrated logistics
Reactive vs. proactive	Reactive buyers	Proactive buyers
Process of supplier selection	Competitive tendering	Total screening
Scope of attention	Role specific behavior and knowledge	Expansive knowledgeable and behavior
Replenishment device	Inventory	Information

Source: Adopted from Storey, el. al., (2002) p6.

While there is no agreement on the exact definition and scope of supply chain, professionals at all levels do agree that supply chain is a series of linked relationships that add value at various levels (Kauffman, 2002) Managing the chain of events in this process is called supply chain management. Effective management must take into account coordinating all the different pieces of this chain as quickly as possible without losing any of the quality or customer satisfaction, while still keeping costs down (Craig 1996; Shin et al. 2000). Hence for the purposes of this study the adopted definition is by Ho et al., (2002) who defined SCM as a philosophy of management that involves the management and integration of a set of selected key business processes from end user through original suppliers, that provides products, services and information that add value for customers and other stakeholders through the collaborative efforts of supply chain members.

2.2 Previous Studies on Supply Chain Management in Kenya

Various studies have been done in the past on Supply Chain Management in Kenya but most of them focused on the commercial entities. Rwoti (2005) in his study of procurement performance of large firms argues that procurement management is a critical issue in organization's management. He further argues that procurement management is significantly affected by rapid changes in business environment. Some of the critical issues arising from changes in environment include quality, supply lead-time, costs and supplier relations. Mwanyota, (2004) studied Supply Chain Management and Enterprise Resource Planning Systems with a focus on supermarkets. The study outlined importance of supply chain management in an organization as including: customer satisfaction, quality improvement and timeliness in delivery. In his conclusion, he suggested that further study need be done to evaluate the hindrances to effective implementation of supply chain management in organizations.

Lutta (2003) studied outsourcing of distribution logistics within supply chain system and concluded that success of the outsourcing can be realized through delegation of responsibilities and accountability to the supplier. Team approach during the implementation stage was critical to its success. Motari (2002), in his study on outsourcing of logistics, concentrated on Medium and Large manufacturing firms. He noted that the field of supply chain management is elitist and needs some kind of special attention. He further observed that with the advent of liberalization, costs consideration has become a major competitive

tool. In his conclusion, he advocates for further research in different organizational setting to evaluate and understand current trends in outsourcing and supply chain management.

2.3 Supply Chain Management Practices

SCM practices vary with different sectors (Wong et al., 2005). In the face of a competitive global market, organizations have downsized, focused on core competencies, and attempted to achieve competitive advantage by more effectively managing all internal and external value-adding activities. Many firms have reduced their supply base so they can more effectively manage relationships with strategic suppliers (Tully 1995). The intense global competition of the 1980s forced world-class organizations to offer low-cost, high-quality, and reliable products with greater design flexibility (Tan 2001). The literature indicates that buying firms are developing cooperative, mutually beneficial relationships with suppliers and viewing suppliers as virtual extensions of their firm (Mason 1996; Copacino 1996). Superior supplier capability can lead to exceptional quality or rapid integration of the latest technological breakthroughs into the buying firm's own products through early supplier involvement (Ragatz et al. 1997). Suppliers may also participate earlier in the product design process to render more cost-effective design choices, develop alternative conceptual solutions, select the best components and technologies, and help in design assessment (Monczka et al. 1994).

Emphasizing internal competencies requires greater reliance on external suppliers to support non-core requirements, particularly in design and engineering support (Prahalad and Hamel 1990). Firms thus find themselves expanding the need to effectively manage internal competencies to include members of the value chain. One important decision relating to the design of an organization's supply chain is the number of suppliers used for a given product or service (Lambert and Cooper 2000; Talluri and Narasimhan 2005). Historically, most organizations have used a very competitive approach of engaging many suppliers in order to reduce prices (Rittenberg and Tregarthen 1999). However, recent trends support and encourage the use of fewer suppliers and the establishment of closer relationships with those suppliers (Hartley and Choi 1996; Fisher 1997). Consequently, reduced number of suppliers is currently viewed as a performance characteristic of a good supply management orientation (Cooper and Ellram 1993; Shin, Collier and Wilson 2000).

SCM practices involve a set of activities undertaken in an organization to promote effective management of its supply chain. Li et al. (2005) attempted to develop and validate a measurement instrument for SCM practices. Their instrument has six empirically validated and reliable dimensions which include strategic supplier partnership, customer relationship, information sharing, information quality, internal lean practices and postponement. Strategic supplier partnership represents the long-term relationship between the organization and suppliers. Customer relationship covers the practices on complaint handling, customer satisfaction, and long-term relationship establishment. Information sharing means the information communicated between partners where the accuracy, adequacy, and timeliness refer to the quality of information. Lean practices are represented by the elimination of waste, low inventory, small lot sizes and JIT delivery. Postponement is the delayed differentiation of products on the supply chain. Other common supply chain practices are:-

2.3.1 Close partnership with suppliers and Close partnership with customers

Cooperation between buyer and supplier is the starting point to establish a successful SCM and a necessary, but insufficient condition. The next level requires coordination and collaboration between buyer and suppliers. This includes specified work-flow, sharing information through electronic data interchange (EDI) and the internet, and joint planning and other mechanisms that permit to undertake the Just in time (JIT) system and total quality management (TQM) in the company (Spekman et al., 1998, Mistry, 2006).

Downstream SCM can be deemed by demand chain management (Frohlich and Westbrook, 2002, Hsu, 2005). Building a close partnership with customers is equally important as establishing a close partnership with suppliers

2.3.2 Just in time supply and Strategic planning

JIT is an integrated set of activities designed to achieve high volume production using minimal inventories of raw materials, work in process and finished goods. Therefore, JIT purchasing requires the suppliers to produce and deliver to the buyer the right quantity at the right time with the objective of continuous and consistent conformance to performance specifications (Canel et al., 2000; Mistry, 2006; Kros et al., 2006).

Conventionally, strategic planning focuses on the manufacturing process, technical innovation, financial considerations and market penetration. Firms integrate strategies in each

of these areas to produce and sell high-quality products at a low price. Given the state of technology at present, a competitor often can match any single firm's advantage in these areas. Thus, firms have begun to explore ways to create competencies in the supply chain through more efficient distribution networks (Lin and Tseng, 2006) improved quality and reduced total cycle time, better post-sale service and higher responsiveness to customer needs (Carter et al., 1997).

2.3.3 Supply chain benchmarking and Few suppliers

Benchmarking of supply chain performance enables comparison between peer's supply chain and competitor's supply chain. This stimulates continuous improvement and hence allowing key performance indicators such as delivery speed, enhanced service quality and experience to be re-positioned and re-valued over time subject to market forces and dynamics.

In contemporary business, many firms prefer a strategy of using few suppliers (Chandra and Kumar, 2000). The strategy of few suppliers implies that a buyer wants to secure a long-term relationship and the cooperation of a few dedicated suppliers. Using few suppliers can create value to the buyer and yield lower transaction and production costs.

2.3.4 Holding safety stock and sub-contracting and E-procurement

Buffering and dampening approaches including safety stock and sub-contracting have been widely adopted SCM practices to cope with uncertainties in a supply chain (Koh and Tan, 2006). Although holding safety stock could be considered as a type of SCM practice for dealing with supply chain uncertainty, not every company has the capacity and resources to produce the goods and services required. Then, in this case, sub-contracting becomes a typical SCM practice for dealing with supply chain uncertainties under resource constraints.

Electronic procurement (e-procurement) as a virtual purchasing application also enhances visibility of data by leveraging supplier negotiations. It allows a company to control their suppliers, hence reducing purchasing cost (Rahman, 2004). Very often, an e-procurement tool also interfaces with an ERP to automate many purchasing and payment tasks (Koh et al., 2006).

2.3.5 Outsourcing and 3PL

Many firms in our contemporary business have been revising their priorities and focusing their resources on a limited number of selected activities and processes to gain more competitive advantages. The outcome of this trend is that firms increasingly outsource some selected activities and processes (Sink and Langley, 1997). As competition becomes more intense, many firms are considering the option of logistics outsourcing in order to streamline their value chains (Franceschini et al., 2003). Boyson et al. (1999) noted that outsourcing relationships historically are based on routine functions, such as warehousing operations and freight payment, whereas today they are based on logistics activities that require more strategic knowledge and expertise, such as information systems, inventory management and customer order fulfillment.

A third-party logistics (3PL) is a type of services of multiple distribution activities provided by an external party (assuming no ownership of inventory) to accomplish related functions that are not desired to be rendered and/or managed by the purchasing enterprise (Sink et al., 1996). The use of a third-party provider for all or part of an enterprise's logistics operations (Coyle et al., 1996) is increasingly popular (Lambert et al., 1999). Coyle et al. (1996) identified several key benefits of logistics outsourcing, namely operating cost reduction, service level improvement, core competence prioritization and employee based reduction and capital cost reduction.

2.3.6 Many suppliers

Traditionally, vendors are selected from among many suppliers on their ability to meet the quality requirements, delivery schedule and the price offered. In this approach, suppliers aggressively compete with each other. The relationship between buyer and seller is usually adversarial. The main purchasing objective in this approach is to obtain the lowest possible price by creating strong competition between suppliers, and negotiating with them.

The success of each SCM practice may depend on the levels of support, training, and implementation barriers. Some practices may be enhanced by management and employee support, which was rated as a combination of contribution and enthusiasm, as reported by Powell (1995). The second factor is the extent to which the firm's workforce is trained in each of the following four areas: problem-solving skills, leadership skills, team-building skills, and job skills (Bowles and Hammond, 1991; Goldstein and Ford, 2002; Greene, 1993). Finally,

the third factor is the extent that success of a practice is blocked by each of the four implementation barriers: unclear objectives, lack of strategy, corporate culture, and lack of a program champion (Evans and Lindsay, 2002).

2.4 Functions of Supply Chain Management

SCM systems support demand and planning and B2B communication. Companies must recognize the importance of planning as a function in the supply chain because randomness and uncertainty ultimately can create chaos on a company's distribution network. SCM systems offer the flexibility and speed necessary against demand uncertainty. In addition, a SCM system is capable of coordinating the supply chain to ensure the effective implementation of just-in-time (JIT) practices. B2B communication is a critical function in the practice of SCM. (Tarn et al., 2002)

SCM systems have two important system functions, maintaining timely information sharing across the overall supply chain and facilitating the synchronization of the entire supply chain. The philosophy of SCM is that a firm has the right product in the right place, at the right price, at the right time, and in the right condition. Under this assumption, an enterprise requires not only the free flow of information within its organizational boundary, but also the timely sharing of the right information with the right business partners. The reason is that the success of a firm's SCM would depend upon the accuracy and velocity of the information which every business partner provides (Zheng et al., 2000).

Tarn et al., (2002) emphasizes that SCM systems can facilitate the synchronization of the entire supply chain because they can assist a firm in integrating internal business processes within the corporate boundary so that all internal functional areas can operate in synchronization. Further, SCM systems allow an individual organization to integrate its business processes with those of its business partners. In other words, when an organization becomes a node of a supply chain, its business success relies on not only the internal efficiency and productivity of the firm, but also that of its business partners.

2.5 Impact of SCM practices on Operational performance

A central objective of effective SCM is to create a major source of competitive advantage for the enterprise to differentiate itself in the eyes of the customers from its competitors by operating at a lower cost (Christopher, 1992). The maximization of firm value is an accepted

goal of all publicly held firms. "Value" however is not a term well understood by all managers (Sridharan, et al. 2005). Vivek Ranadive (1999) explains that many business executives confuse "value" with "profit." Ranadive makes the distinction by saying "profit is a consequence of creating value". Ranadive emphasizes that creating customer value is one of the few existing differentiators that can create competitive advantage while the other classic differentiators outlined by Michael Porter and others – cost leadership, quality, focus and speed – have themselves become commodities. They are simply the price of market entry (Ranadive, 1999). The measures of the operational performance construct used in this study are flexibility, reduced lead time in production, forecasting, resource planning, cost saving and reduced inventory level. These measures are identified as:-

2.5.1 Flexibility and Reduced lead time.

SCM practices may enhance a firm's flexibility, which could be defined as the firm's ability to adapt to the changes in its business environment. The adaptation of the "many suppliers" practice could increase flexibility generating alternative sourcing for procurement by reducing supply chain risks. Building long-term partnership relations with suppliers and customers also helps to improve the flexibility of the supply chain by creating a mutual understanding among the members (Chang et al., 2005). Holding safety stock and sub-contracting could dampen down supply and demand chains uncertainties through delivering from inventory and/or purchasing sub-contracted resources. Outsourcing and 3PL are two of the frequently used SCM practices by firms to provide flexibility to internal capacity to ring fence their resources for the core activities.

E-procurement, delivery from stock, single sourcing and JIT delivery practices may help reduce delivery lead time as well as increase responsiveness, and thus provide competitive advantage to the firm.

2.5.2 Forecasting and Resource planning and cost saving.

Forecasting accuracy is the most important feature in the performance of supply chains. It is a joint performance of a combination of resources such as supply of material, manufacturing, production planning and customer demand prediction. Wickramatillake et al. (2006) applied the baseline forecast to consider the major milestones of a large scale project in order to measure the performance of the supply chain with respect to meeting the delivery targets. Through closer partnerships with suppliers and customers, it is anticipated that information

could be shared, and thus, fed into demand forecasts to improve the accuracy of predictions. This forecast will in turn enable the firm to deliver the order more confidently.

With appropriate strategic planning, it may be anticipated that the utilization of resources will be optimized leading to cost savings. For example, reduced cycle time in production could be materialized through reducing set-up time and/or eliminating non value-added activities. With a shortened cycle time, more orders could be processed, which would then result in improved efficiency and reduced production cost per unit. In addition, the use of an e-procurement tool could also shorten order lead time and reduce ordering cost.

2.5.3 Reduced inventory level.

In the past, carrying inventory in stock was a normal business practice to guard against risk of unfulfilled demand (Chandra and Kumar, 2000). They further pointed out that today, many firms find that holding inventory is costly and so they try to push inventory on to someone else in the supply chain. It is a challenge for constituents to ascertain where inventory should be held in the supply chain. Consequently, some firms are demanding that the manufacturer deliver inventory to private customer warehouses more frequently and in smaller lots.

Some important supply chain inventory issues are: shorter delivery times, just in time (JIT), point of sale data, vendor-managed inventory, and consignment inventory (Mayer, 1996). JIT supply allows minimum inventory holding through supplies delivered when they are needed. This SCM practice will not only reduce inventory level, but will also free up warehouse space and untighten cash flow (Mistry, 2006).

2. 6 Impact of SCM practices Organizational performance

Organizational performance has in the past has been measured relying on both financial and non-financial criteria. Although financial performance is the ultimate aim of any business organization, other indicators such as innovation performance (Llorens et al., 2003), market share and other non-financial performance indicators may also be equally important in evaluating the impact of SCM practices performance (Demirbag et al., 2006). The short-term objectives of SCM are essentially to enhance productivity and reduce inventory and lead time, while long-term objectives are to increase market share and integration of supply chain for all members of the supply chain (Li et al., 2006; Lyons et al., 2004; Tan et al., 1998). SCM practices can help an organization achieve.

2.6.1 More accurate costing and Increase in coordination between departments. .

The use of an e-procurement tool would assist the company to provide a more accurate costing for the product and service produced. This can be achieved through real-time evaluation and the updated information in key accounts of buyers and suppliers (Rao, 2006). Working with "few suppliers" helps reduce the number of transactions for procurement. "JIT supply" reduces the holding cost, which is hard to predict. The cost of goods and services outsourced to subcontractors and 3PL companies may be calculated more accurately than producing them in-house.

Strategic planning could increase integration between various departments of an organization through information retrieval and sharing. This SCM practice helps to reduce the departmental barriers and generate an organization-wide plan. "JIT supply" and "few suppliers" practices are the consequences of JIT philosophy which traditionally relies on tight collaboration in every levels of organization. The benefits of close relationship with suppliers and customers are only realized in a well coordinated organization.

2.6.3 Increase in coordination with suppliers and coordination with customers.

The use of few suppliers, forming close partnerships with suppliers and practice of e-procurement could increase coordination with suppliers. The practice of using few suppliers helps to build more effective supplier relationships. Through establishing close partnerships with suppliers, product, process and technology innovations could be better achieved, e.g. joint development of a new product, joint effort in reducing purchased lead-time, cross training workforce, etc. This partnership will not only benefit the supplier and the customer, but will also improve the coordination with the suppliers due to a closer "control" of the supply chain (Helo and Szekely, 2005). With an e-procurement practice, the ordering process could be streamlined and automated. Transactions could be managed more centrally and hence it is clear that the increase in coordination with suppliers in this context is via information technology (Rahman, 2004).

Increase in coordination with customers could be achieved through forming close partnerships with customers. For example, potential customer orders could be negotiated and clarified jointly (Wu et al., 2004).

2.7 Supply Chain Management performance

Chan (2003) describes performance measurement as feedback or information on activities with respect to meeting customer expectations and strategic objectives. It reflects the need for improvement in areas with unsatisfactory performance. Thus efficiency and quality can be improved. SCM can be viewed as a philosophy based on the belief that each firm in the supply chain directly and indirectly affects the performance of all the other supply chain members, as well as ultimately, overall supply-chain performance (Cooper et al., 1997). The effective use of this philosophy requires that functional and supply-chain partner activities are aligned with company strategy and harmonized with organizational structure, processes, culture, incentives and people (Abell, 1999).

In this era of intense competition, the key to sustainable competitive advantage lies in delivering high quality service that will in turn result in satisfy customers (Shemwell et al., 1998). Supply chain is recognized as a critical factor in gaining competitive advantage (Christopher, 1992). Performance measurement systems provide meaningful insights needed to address this issue, and are a necessary tool in today's competitive business climate. They provide a platform for effective planning and control, as well as decision making in complex environments, depicted by supply chain practices (Chan et al., 2003, p. 635). Numerous accounts highlight varying perspectives to performance measurement in SCM (Andersson, Aronsson, & Storhagen, 1989; Beamon, 1999; Gunasekaran et al., 2001; Chan et al., 2003).The importance of designing a performance measurement system that is aligned to strategic goals has been emphasized (Kaplan & Norton, 2000).

Efficiency and effectiveness have been used as key indicators measuring supply chain performance (Beamon, 1999; Holmberg, 2000; Li et al., 2006; Tan et al., 1998). Two well-known indicators are cost-containment and performance reliability constructs. Cost-containment indicator includes such activities as cost in and outbound activities, warehousing costs, and inventory-holding cost, and increasing asset turnover. Reliability indicator addresses such areas as order fulfillment rate, inventory turns, safety stocks; inventory obsolesces, and number of product warranty claims.

2.8 Information Technology (IT) as an enabler of effective supply chain management

Sridharan et al., (2005) argues that much of the current interest in supply chain management is motivated by the possibilities that are introduced by the abundance of data and savings

inherent in the sophisticated analysis of these data. The innovative opportunities coming to the forefront with electronic commerce (e-commerce), especially through the internet, have increased the interest in information technology (IT). The primary goal of IT in the supply chain is to link the point of production seamlessly with the point of delivery or purchase. The idea is to have an information trail that follows the product's physical trail. This allows planning, tracking and estimating lead times based on real data. The data should be accessible in the system from a single point of contact. Managers analyze, plan activities and make decisions based on information from the entire supply chain. Clear communications and quick responses to those communications, are key elements of successful supply chain management.

While, Ralph Lilze, an internal supply chain consultant at Bayer Corporation suggests that, "For an effective supply chain, you have to share confidential information among vendors, customers and internal departments" (Kolbusak-McGee, 1998). Technologies of the internet and the web can enhance effective communication. Software that uses the internet can help all members of the supply chain review past performance, monitor current performance and predict when and how much of certain products need to be produced (Schneider and Perry, 2000). However, according to Lilze, although IT is an enabler and integrator for supply chain management, organizations need performance measurements and key practices in place to have an effective system. That is, "an IT solution for SCM is only as good as the business foundation on which it is built" (Kolbusak-McGee, 1998).

2.9 Global Supply Chain Management

Global competition is transforming the way products are produced and moved around the world. A new structure, namely, the global supply chain, has evolved which is able to take advantage of the unique comparative advantages of differing countries. Given the reduced trade barriers, it is now possible to garner the comparative advantage that differing nations have to offer. The various value-adding activities of a supply chain can be strategically dispersed among various countries and coordinated to produce the competitive advantage (Prasad and Sounderpandian, 2003). To gain competitive advantage, a firm needs to examine its activities in relation to the comparative advantages offered by various nations. Matching these activities and the sourcing decisions with the appropriate country conditions can lead to gains in cost, quality, lead times and perhaps innovation Gaining a competitive advantage in international supply chains requires matching the value-adding activities of a chain with the

unique comparative advantages offered by diverse nations that make up the chain. To do this, a supply chain manager must identify and control the factors that influence the performance of the chain in each of the three areas, namely, procurement, processing and distribution (Prasad and Sounderpandian, 2003).

Global configurations of firms provide access to cheap labor and raw materials, better financing opportunities, larger product markets, arbitrage opportunities, and additional inducements offered by host governments to attract foreign capital (AlHashim, 1980; Kogut and Kulatilaka, 1994). However, coupled with these benefits that entice firms to go global are the uncertainties and consequent risks that managers face in global supply chains. As Barry (2004) argues, "An enterprise may have lowest over-all costs in a stable world environment, but may also have the highest level of risk".

Global Supply Chain Management allows corporations to take advantage of diversity in the international environment by recognizing and exploiting regional differences, i.e., in the level of product and process technology expertise, labor force capabilities, input factor costs, local tax rates, and the capabilities of offshore vendors (Cohen and Mallik, 1997). These networks have to be carefully managed for lead times (Dunning, 1988; Starr, 1984), quality and costs. This requires controlling the inbound, outbound and procurement functions (Porter, 1986; Ellram and Carr, 1994) with a supporting information system (Goonatilake, 1990). International value chains are a mechanism by which firms can achieve a competitive advantage of either low cost or differentiation through the processing activities performed and their corresponding linkages with suppliers and buyers. These activities and linkages can be spread out as part of a firm's global strategy.

2.10 Benefits of supply chain management

Some of the benefits of SCM are: increased inventory turnover, increased revenue, and cost reduction across the chain are the most sought after (Daugherty et al., 2005; Attaran, 2004; Ferdows et al., 2004; Leonard and Cronan, 2002; Fine, 2000). Collaboration not only enables partners to reduce one another's costs but also allows inventory to cycle through to customers faster. The two-fold result is increased revenues and decreased costs that can be shared across the chain.

Two other core benefits include decreased order cycle times and greater product availability (Leonard and Cronan, 2002). To win customer allegiance, firms must have what customers want when and where they want it. Close relationships with suppliers leave room for special orders in unique times of high demand, helping satisfy the customer expectations. Additional benefits are market responsiveness, added economic value, capital utilization, decreased product time to market, and logistics cost reduction (Lee, 2004; Mentzer et al., 2000; Tyndall, 2000; Christopher and Ryals, 1999). Revenue growth fueled by increased responsiveness occurring at lower costs using fewer assets translates into stellar performance.

SCM as one of the best practices enhances the chances of the organization to attain world class status. This is because it spurs the organization to aim for constant and continuous improvement on global scale (chase et al., 2001). SCM also spurs the organization to rapidly adapt changes in the external environment thereby fostering a fluid and flexible organization, an essential characteristic for survival and growth in today's ever changing business environment (Zheng et al, 2000; fisher, 1997). Zheng et al, (2000) further emphasizes that SCM fosters a spirit of shared ownership of the problems and solutions; strong commitment and involvement by to management; consistent goals and objectives communicated to all levels and functions and across organizations in the supply chain, so that all programs are in consonance and effective use of recognition and rewards. SCM leads to increased internal business operations efficiency as a result of promoting inter-departmental cooperation and collaboration towards achieving common organizational objectives (Fischer, 1997). A system-wide integrated network is an essential determinant of supply chain performance. Cross functional behaviour is relevant. So the internal functions should be integrated (Narasimhan and Kim, 2002). Overall, SCM potentially creates value for all members in the chain. However, such benefits vary in importance and degree among partnering chain members (Agrawal and Pak, 2001).

2.11 Challenges to effective supply chain management

The resisting forces to supply chain management come both from the nature of the organization itself and the people that compose the organization. These barriers can be classified under one of two headings: "inter-firm rivalry" and "managerial complexity" (Park and Ungson, 2001). Inter-firm rivalry is a misalignment of motives and behaviors among allying partners within the strategic supply chain (Park and Ungson, 2001). Some barriers under this category include internal and external turf protection, poor collaboration among

chain partners, and lack of partner trust. In short, inter firm rivalry is the tendency for allying partners to compete rather than willingly cooperating. Absent a willingness to cooperate, a supply chain will not be able to attain lower costs and higher returns on investment. Further, irregular collaborative meetings among chain partners hinder managers' opportunities to share with one another concerns, weaknesses, and best practices (Fawcett et al., 2008).

Effective SCM probably hinges more on an understanding of the business processes that must work together than on the choice of technology. Usually, SCM projects are complex and the required outlays of time and money are great (McCormick, 2001). Many large companies are conglomerations of business units and acquisitions across the globe (Spiegel, 2001). It may take years to integrate the supply chain of such companies. It is necessary to know how people work together and what kind of information will be exchanged in order to determine which technologies can support these exchanges and the best way to connect them (Ramos, 2001). Spiegel speaks of the "Tower of Babel problem"; where every customer uses a different system or standard. Mid-tier companies often lack the resources for requisite technology systems. One must not overlook the human issues; workers may over-inflate forecasts or misrepresent inventory information. In addition, as reflected in a recent survey by CIO Insight, one of the first areas to be cut in a budget crunch is SCM (McCormick, 2001).

Other barriers to SCM fall under managerial complexity or misalignments in allying firms' processes, structures, and culture (Park and Ungson, 2001). Under the umbrella of managerial complexity barriers include information system and technological incompatibility, inadequate measurement systems, and conflicting organizational structures and culture (e.g. Sheridan, 1999; Tyndall et al., 1998; Quinn, 1997a). Because many firms are comfortable using their systems for only their own tasks, it is not surprising to see inconsistent information and technology systems as a barrier. People are change averse and unwilling to share information for fear of exposing their weakness and secrets to others. If SCM is to be implemented across company borders, a revamp in attitude and thinking is necessary. Cooper et al. commented: Successful supply chain management requires a change from managing both individual functions to integrating activities into key supply chain processes (Cooper et al., 1997, p. 5).

Despite the popularity of SCM, organizations are not implementing it. Several reasons for this have been posited. Fragmented approaches, lack of integration, lack of management buy-in, difficulties in the measurement and availability of information and inadequate information

systems can all act as barriers, thus preventing organizations from implementing this holistic approach to SCM (Monczka and Morgan, 1997). Many of these barriers stem from SCM's multidisciplinary nature. Consequently, different organizations in a supply chain tend to stress different aspects of it leading to problems in creating a coherent inter-organizational supply chain vision. This problem can often be exasperated by senior executives who lack real understanding of what SCM is, or fail to buy-in to its practice. This can lead to inconsistencies of approach not just within the chain but also within individual organizations. Relationships and communication therefore become critical in creating consistency of direction within and between organizations (Caldwell, 2003).

Farley (1997) concludes that the single most important prerequisite is a change in the corporate cultures of all members in the value chain to make it conducive to supply chain management. A traditional culture that emphasizes seeking good, short-term, company-focused performance appears to be in conflict with the objectives of supply chain management. Supply chain management focuses on positioning the virtual organization in such a way that all contributors in the value chain benefit. Effective supply chain management rests on the twin pillars of trust and communication (Grieco, 1989), and procurement and logistics professionals must be equipped with the necessary expertise in the critical functions of their own enterprise and fully understand how it affects the entire value chain.

A buyers' market is an ideal situation in which to develop long-term strategies with key suppliers because buyers have leverage in negotiating cost, quality, and certification of processes, acquisition and sharing of new technology and production competence, especially for recurrent transactions that require specialized processes (Ellram, 1994). In response to the intense global competition, mergers and acquisition that create redundant logistics capability, and new information technology, firms may adopt supply chain management to move beyond mere cost reduction into the domain of real manufacturing efficiency (La Londe and Masters, 1994; Porter, 1994).

Despite these challenges, the literature offers suggestions for effective implementation of SCM. Ramos (2001) suggests slowly integrating various segments of a company into a SCM system in the presence of limited resources. The internet can lower the cost of SCM for mid-tier companies (Spiegel, 2001) as well as allow direct connection to companies' main

suppliers if the suppliers are online (McCormick, 2001). Companies desiring to enhance the effectiveness of SCM efforts must look at the whole supply chain during the planning process and be sure to carefully assess the cooperation that can be expected from other supply chain members. It is not likely that one vendor will be able to offer a complete package to meet an organization's needs which means that management will most likely need to coordinate technology from multiple vendors. Gaining the benefits of SCM investments requires true integration among supply chain members. Integration may lead to overhauling the way work gets done in the organization. For example, firms may find that installation of manufacturing and production planning software can require that its plants begin processing to a demand-based schedule instead of making whatever they can each day. Such reengineering of business processes can take years and cost millions of dollars including the investment in new technologies (Stedman, 2000). When large expenditures are undertaken, it is essential to ensure that the expenditures result in the ultimate goal of all management, i.e. maximization of firm value.

2.12 The Public Procurement and Disposal Act, 2005

The Public Procurement System in Kenya has evolved from a crude system with no regulations to an orderly legally regulated procurement system. The Governments Procurement system was originally contained in the Supplies Manual of 1978, which was supplemented by circulars that were issued from time to time by the Treasury. The Director of Government Supply Services was responsible for ensuring the proper observance of the provisions of the Manual. The Manual created various tender boards for adjudication of tenders and their awards (http://www.ppoa.go.ke.)

A review of the countries public procurement systems was undertaken in 1999 and established that, there was no uniform procurement system for the public sector as a whole, there were no sanctions or penalties against persons who breached the regulations in the Supplies Manual, other than internal disciplinary action. Consequently application of the rules was not strict and many of the norms were not followed, the Supplies Manual did not cover procurement of work, the dispute settlement mechanisms relating to the award procedures as set out in the Manual were weak and unreliable for ensuring fairness and transparency and the records of procurement transactions in many cases were found to be inaccurate or incomplete or absent, which led to suspicions of dishonest dealings at the tender

boards(http://www.ppoa.go.ke.). A major component of these reforms is streamlining the public procurement system. A milestone was achieved in this area with the enactment of the Public Procurement and Disposal Act, 2005 and the Public Procurement and Disposal Regulations, 2006. This Act was given a commencement date of 1st January, 2007 via legal Notice No. 171 of 29th December, 2006. The Regulations have been gazzetted through legal Notice No. 174 of the same date and are now operational. This new legal and regulatory regime for procurement provides a framework for overhauling the manner in which public funds are utilized (http: //www.treasury.go.ke. as at 22/10/2008).

The Public Procurement and Disposal Act, 2005 created the Public Procurement Oversight Authority (PPOA), the Public Procurement Advisory Board (PPAB) and the continuance of the Public Procurement Complaints, Review and Appeals Board as the Public Procurement Administrative Review Board (PPARB). The PPAB and PPARB are autonomous bodies. The PPOA is mandated with the responsibility of ensuring that procurement procedures established under the Act are complied with; monitoring the procurement system and reporting on its overall functioning; initiating public procurement policy and assisting in the implementation and operation of the public procurement system by; preparing and distributing manuals and standard tender documents, providing advice and assistance to procuring entities, and develop, promote and support training and professional development of staff involved in procurement(http://www.ppoa.go.ke.).

The systems had other institutional weaknesses that not only undermined its capacity for carrying out their mandates effectively but also led to a public perception that the public sector was not getting maximum value for money spent on procurement. In view of these shortcomings it was found necessary to have a law to govern the procurement system in the public sector and to establish the necessary institutions to ensure that all procurement entities observe the provisions of the law for the purpose of attaining the objectives of an open tender system in the sector. Consequently the establishment of the Exchequer and Audit (Public Procurement) Regulations 2001 which created the Public Procurement Directorate (PPD) and the Public Procurement Complaints, Review and Appeals Board (PPCRAB) (http://www.ppoa.go.ke.).

This will go along way in enabling supply chain management practices are effectively and efficiently adopted in the public sector and public institutions.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This research is an exploratory study on key issues with respect to supply chain management practices. This being an exploratory study, a case design approach with reference to The University of Nairobi was adopted. A case study is an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2003, p. 13). Case studies lend themselves to both generating and testing hypotheses (Flyvbjerg, 2006). This type of research design was chosen because it enables thorough analysis of unity of interest. It is therefore, the most appropriate research design for studying the subject of supply chain management practices in details.

The University of Nairobi was picked since it is the oldest and the biggest university, also it has many colleges which are not centrally located but are situated in various locations. The fact that Kenyan universities have similar administrative structures makes it easier for the same findings to be easily generalized and implemented.

3.2 Population of study

This being an exploratory study, a case design approach with reference to University of Nairobi was adopted. The study population was drawn from the various employees in responsible positions who are involved in one way or the other with the daily supply chain activities and hence is better placed to give more informed details on the practices. This included staff working in the Procurement department, College registrars, Accountants and bursars, who were asked to provide, either personal or university information related to their supply chain management and their working relationship with suppliers and internal customers.

3.3 Sampling method

Sample size affects confidence interval, thus one could, in principle, select sample size to yield any degree of confidence (Dooley, 1995). Formulae exist of computing the required sample size as a function of desired confidence level, the desired precision or width of the confidence interval, and the population variance as estimated by the sample (Williams, 1978). However the use of formulae has been criticized for several reasons namely: formulae require

information not usually known until after the survey, such as estimated variability; formulae are based on the assumption of normality of sampling distribution. Problems may arise as surveys may measure different variables with different measurement precisions. Further even when researchers know the ideal sample size, they may have to work with smaller budgets because of budget limitations and other constraints (Dooley, 1995).

With reference to the foregoing observation, the size of the survey population and taking into consideration low response rates and other handles (e.g. technical, financial, time, understanding of the field), this study was targeted at all the identified officers in the University of Nairobi as shown below.

Table 3:1: Study population by composition

STRATA	STRATA SIZE
Deputy Vice-Chancellor (Administration and Finance)	1
Procurement Manager	1
Deputy Procurement Manager	1
Procurement officers	12
Bursars	6
College Registrars	6
Accountants	15
TOTAL	**42**

The sample frame for the officers was obtained from the University of Nairobi human resource system. Purposive sampling was used. In Purposive sampling Subjects are selected because of some characteristic (Patton 1990). The researcher obtained the required sample by systematically selecting only the people who worked directly with the supply chain members as they could give information and understand better the terms and aspects of supply chain management.

Based on the above, a sample of 41 respondents was considered. This conforms to the widely held rule of thumb that to be representative a sample should have 30 or more test units (Wayne and Terrell, 1995).

3.4 Data collection

The study relied on primary data, which was collected through questionnaires. A structured questionnaire was used to obtain data from respondents, which was analyzed in order to provide a complete picture of the status of the supply chain management practice at The University of Nairobi.

The research instrument was divided into four parts where; Part A was designed to collect general information about the respondent; Part B, C and D were designed to collect data on the three study objectives. Specifically, part B was intended to collect data on the various supply chain management practices at the University of Nairobi; Part C outlined various benefits that can be derived from the implementation and use of supply chain management practices while Part D listed various challenges that affect the implementation and use of supply chain practices at the University of Nairobi.

The first study objective sought to explore the various supply chain management practices that the University uses, thus various reasons identified from literature were listed for the respondents to select appropriately. Since the purposes are not mutually exclusive, respondents were required to use a likert type scale to rank the various practices. The second objective sought to establish the benefits the University can derive from implementation and use of supply chain management practices. Various benefits were listed and the respondents were required to indicate their importance on a likert type scale. Finally, the third objective sought to establish the challenges affecting institutional readiness that face the University of Nairobi in the implementation and use of supply chain management practices. Various challenges identified in other organizations were listed and respondents rated their influence on a likert type scale.

The research instrument was subjected to pretest reliability tests by initially applying it to a small sample (10) respondents. This helped the researcher identify any ambiguity and unclear questions to the respondents. The researcher that the questions were well understood and captured the desired information accurately. To facilitate data collection drop and pick method was largely employed. The questionnaires were administered directly by the researcher, thus face to face interviews were conducted where necessary.

3.5 Data Analysis

The data collected was edited for accuracy, uniformity, consistency and completeness, and then arranged to enable coding and tabulation before analysis. Once collected, the data was collated, organized, summarized and described. Data was analyzed through descriptive statistics. Descriptive statistics will provide an overview of respondents' perception of the various aspects of supply chain management practices, in the University of Nairobi. Summary measures of central tendency (mean) and dispersion (standard deviation) were calculated, further frequency distribution tables were used to show how various respondents ranked the various aspects under exploration. A data reduction technique (factor analysis) was used to reduce the various dominant supply chain management practices to make interpretation easier. The data was summarized and analyzed with the aid of statistical package for social sciences (SPSS).

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter discusses the study findings as to the use of supply chain management practices at the University of Nairobi. From the initial target population of forty two, only twenty four questionnaires were collected back. This represented a response rate of fifty seven (57%) percent.

4.2 Embracing Supply chain Management Practices at the University

The respondents were asked to state whether they felt the university had adopted supply chain management practices and if they felt it had, they were expected to state their satisfaction and further make a brief comment.

From the responses obtained, 70.83% said they felt that the university had embraced supply chain management practices in one form or the other, 20.83% said they university had not embraced SCM practices while 8.34% did not respond. Table 4.1.1 shows the actual numbers obtained from the study.

Table 4.2.1: Embracing Supply chain Management Practices at the University

Responses	Frequency	Percent	Valid percent
Yes	17	70.83	70.83
No	5	20.83	91.66
Non-response	2	8.33	100.0
Total	24	100.0	

Source: Research data

Further, on the postulation that most units had embraced supply chain management practices, respondents were asked to state their satisfaction levels with the SCM strategies in place. Most respondents who answered the question expressed the opinion that they were satisfied with the SCM strategies in place. Of the twenty four valid questionnaires, only twenty one responded to the question, with 70.83% of them saying they were satisfied with the SCM strategies in place. While 16.67% felt they were not satisfied. The responses are depicted in table 4.1.2.

Table 4.2.2: Satisfaction with Supply chain management strategies in place

Responses	Frequency	Percent	Valid percent
Unsatisfied	4	16.67	16.67
Satisfied	17	70.83	87.5
Non-response	3	12.5	100.0
Total	24	100.0	

Source: Research data.

The respondents were expected to make a brief comment on their ranking as to the satisfaction levels with the SCM strategies. From the responses most of the comments indicated the 'newness" of the concepts in the university since most of the touched on procurement area. A summary of the comments are indicated in table 4.1.3.

Table 4.2.3: Respondents comments on Satisfaction with SCM strategies in place

1. A transparent approach/policy to procuring goods and services has not been adopted
2. Procurement officers in some units have a high turnover./there is need for additional staff
3. There are various committees put in place to deal with procurement procedures.
4. The use of the public procurement and disposal act, 2005 has improved procurement systems
5. Each unit has a procurement plan which at times is not followed and hence procurement is haphazard
6. Lack of understanding/ enlightenment of SCM objectives/approaches
7. SCM practices exist on paper but when it comes to implementation they are not followed.
8. Lack of skills in SCM

Source: Research data.

Comments on satisfaction with supply chain management strategies in place at the University of Nairobi conforms with Mizikaci (2006) observation that new practices in management and industry have appealed to decision makers of higher education.

4.3 Supply chain management practices

Supply chain management (SCM) has become a very prominent concern for both large and small companies as they strive for better quality and higher customer satisfaction (Mentzer et al. 2000; Chopra and Meindle 2001). SCM practices enhance the chances of an organization attaining world-class performance status. This is because it spurs the organization to aim for constant and continuous improvement on a global scale (Chase et al., 2001).

In line with the understanding that much like traditional corporations, the universities and colleges need to see the supply chain management process as an effective area to target for cost savings opportunities (Chase, 2007). The current study sought to identify various supply chain

management practices in the Kenyan education sector with a specific reference to the University of Nairobi.

To achieve this objective, various supply chain practices were listed and respondents asked to rank them in terms of the extent they are used at the university. In total forty six practices were subjected to ranking. A likert type scale was used, with the most used practice scoring five(5) points, whereas those not used at all scored one point(1). The mean and standard deviation score were computed. Table 4.2.1 provides the results obtained.

Table 4.3.1: Ranking of supply chain management practices in terms of the extent of use.

	Practice	Mean	Standard Deviation	Coefficient of Variation
1.	Supplier processes and deliveries are usually inspected.	4.10	1.221	29.78%
2.	There are rules that govern the disposal of obsolete items.	4.05	1.117	27.58%
3.	There exists well documented procurement processes/ procedures.	4.05	1.117	27.58%
4.	There exists procurement plans/budgets for each department.	3.95	1.203	30.46%
5.	The University subcontracts most of the major projects.	3.90	1.091	27.97%
6.	There exists a strategic plan for procurement department.	3.81	1.123	29.48%
7.	There is willingness to share information to all concerned with supply chain issues.	3.67	1.197	32.62%
8.	There is a strategic supplier for goods and services.	3.62	1.161	32.07%
9.	SCM strategies are incorporated in the overall University strategy.	3.57	1.287	36.05%
10.	A stable relationship exists among supply chain members.	3.57	1.076	30.14%
11.	Supplied products are acceptable to all parties (procurement dept, finance department and the user).	3.52	1.289	36.62%
12.	There exists a list of all suppliers.	3.48	1.123	32.27%
13.	The departmental procurement plans/budgets are adhered to.	3.43	1.287	37.52%
14.	Invoices are usually accurately done.	3.43	1.207	35.19%
15.	Orders are picked correctly and promptly.	3.38	1.284	37.99%
16.	The university has many suppliers	3.38	1.359	40.21%
17.	There are no error in the payment process	3.35	1.268	37.85%
18.	Persons involved in the supply chain management process meet regularly.	3.33	1.354	40.66%
19.	There exists a close partnership with customers.	3.33	1.238	37.18%
20.	There exists a list of prequalified suppliers that is approved and no alteration is done are at the departmental level.	3.24	1.513	46.70%
21.	Supply chain management documents are usually complete and accurate.	3.24	1.179	36.39%
22.	The Suppliers list is Continuously reviewed.	3.24	1.221	37.69%
23.	Supplier performance is measured and feedback given.	3.14	1.315	41.88%
24.	Reduction of lead time variability is being done.	3.05	1.161	38.07%
25.	Supply chain performance is measured in order to facilitate greater understanding of supply chain management	3.05	1.431	46.92%
26.	Suppliers are charged frequently.	3.00	1.049	34.97%

	Practice	Mean	Standard Deviation	Coefficient of Variation
27.	There exists a close partnership with suppliers.	2.95	1.117	37.86%
28.	Non core activities are usually Outsourced.	2.95	1.284	43.53%
29.	Information Technology (IT) is used to carry out supply chain management.	2.90	1.300	44.83%
30.	Supply chain benchmarking is done against other institutions.	2.90	1.179	40.66%
31.	There is Reduction of response time across the supply chain.	2.90	1.091	37.62%
32.	Orders are synchronized with the final demand	2.90	1.252	43.17%
33.	There are no delays to deliver items to the user	2.86	1.108	38.74%
34.	There exists a link between internal supply chain processes and external supply chain processes.	2.86	1.062	37.13%
35.	Adoption of lean inventory practices (e.g. just in time (JIT)) is encouraged.	2.81	1.209	43.02%
36.	Information/Data is availed across all involve in the supply chain management	2.76	1.375	49.82%
37.	Unnecessary steps in supply chain management have been done away with.	2.76	1.375	49.82%
38.	Shopping around every now and then for essential items is usually done.	2.76	1.091	39.53%
39.	Payments to suppliers are made on time	2.71	1.271	46.90%
40.	All needed items are usually availed	2.67	1.278	47.87%
41.	The process Supply Chain Management delivery is flexible and innovative.	2.67	1.197	44.83%
42.	Excess inventory is sent back to the vendor.	2.65	1.348	50.87%
43.	Safety stock is usually held	2.62	1.284	49.01%
44.	The university has few suppliers	2.62	1.024	39.08%
45.	Users are contacted for feedback	2.43	1.399	57.57%
46.	There is use of E-procurement to manage the procurement process.	2.24	1.375	61.38%

Source: Research data.

Of the forty six practices listed the practice of inspecting supplier processes and deliveries was ranked as the most used practice as it had the highest scored indicator with a mean score of 4.10. this quite important since Successful integration of the supply activity with what customers demand leads to delivery of high quality products, on time, and at low cost (Cousins and Menguc, 2006; Frohlich and Westbrook, 2001). Followed by the practice of having rules that govern the disposal of obsolete items and documenting of procurement processes/procedures were ranked second each having a mean score of 4.05, with having procurement plans/budgets for each department and the practice of the University subcontracting major projects following having a mean score of 3.95 and 3.90 respectively. It is encouraging to find out that the university subcontracts major projects as emphasizing on internal competencies requires greater reliance on external suppliers to support non-core requirements, particularly in design and engineering support (Prahalad and Hamel 1990). Least ranked in the extent of usage and implementation is the practice of use of E-procurement and contacting users for feedback each having a mean score 2.24 and 2.43 respectively this should be improved since Integration of

internal processes of the organization with the suppliers and customers forms the essence of the whole idea behind SCM, with the widespread use of internet, web-based systems enable organizations to form strong customer and supplier integration for inventory management, demand forecasting, customer and supplier relationship management (Frohlich and Westbrook, 2002). The practice of holding safety stock and having few suppliers follows with a mean score of 2.62. the university of Nairobi should reconsider this as reduced number of suppliers is currently viewed as a performance characteristic of a good supply management orientation (Shin, Collier and Wilson 2000).

The results obtained indicate various aspects of the university in terms of its operations and future direction in supply chain management for example, high ranking of "supplier processes and deliveries being inspected", "there being rules that govern the disposal of obsolete items" and "there being a documentation of the procurement processes/procedures" and "having procurements plans/budgets for each department, indicates the University's sensitivity and focus on quality and procedure. Similarly, the low ranking of the use of e-procurement and contacting users for feedback sends mixed signals on how the university views its users and if it's proactive in embracing IT systems. Kannan and Tan, (2007), notes that how a firm interacts with its supply chain to understand customers' needs and works to ensure that its suppliers' capabilities can meet these needs, is, however, of some significance. Further analysis was carried out using coefficient of variation to find out how the data is distributed, or how far each element is from some measure of central tendency (mean). Highest dispensation was found in the factor that sought to find out if there was use of E-procurement in managing the procurement process with a score of 61.38%. Followed by whether users were contacted for feedback with 57.57% and if excess inventory is sent back to the vendor with a score of 50.87%. This indicated that respondents were not so sure of what really goes on with these factors hence the disparity. Factors with low dispensation were that there are rules that govern the disposal of obsolete items and there exists well documented procurement processes/ procedures each scoring 27.58%. followed by the factor that sought to find out whether the University subcontracts most of the major projects with 27.97%, Supplier processes and deliveries are usually inspected with 29.78% and There exists procurement plans/budgets for each department which scored 30.46%. This shows that most respondents felt that these practices existed at the University of Nairobi.

Further analysis was conducted to classify the various supply chain management practices into respective classes. To achieve this objective, factor analysis (data reduction technique) was carried out (using SPSS). Eleven broad categories of measures were identified after twenty-one

(21) iterations, with a total component loading of 91.53% table 4.1.4 shows the eleven (11) classes and the respective measures in each classes. From the analysis measures related to demand management had the highest factor loading of 8.299, followed by follow management and quality management each with factor loading of 5.567 and 4.453 respectively. Least loadings were reported on the number of suppliers with 2.042, Supply chain members' relationships with 1.680 and Managing suppliers with 1.474.

The resulting factor classification shows differences with research findings on SCM practices by Li et al. (2005) who attempted to develop and validate a measurement instrument for SCM practices. Their instrument has six empirically validated and reliable dimensions which include strategic supplier partnership, customer relationship, information sharing, information quality, internal lean practices and postponement. Strategic supplier partnership represents the long-term relationship between the organization and suppliers. (For component matrix, total variance explained table, scree plot and rotated matrix tables see appendix III: Table Obj 1 i, ii and iii).

Table 4.3.2: Classification of Supply Chain Management Practices.

	Supply Chain Management Practices.	**Factor Loading**	**Sums of square factor loadings**
	Factor One - Demand management		
1.	Adoption of lean inventory practices (e.g. just in time (JIT)) is encouraged.	0.816	
2.	There exists a list of prequalified suppliers that is approved and no alteration is done are at the departmental level.	0.812	
3.	Unnecessary steps in supply chain management have been done away with.	0.780	
4.	Supplier performance is measured and feedback given.	0.723	
5.	Users are contacted for feedback	0.720	
6.	Safety stock is usually held	0.719	8.299
7.	There is use of E-procurement to manage the procurement process.	0.673	
8.	Reduction of lead time variability is being done.	0.661	
9.	Information Technology (IT) is used to carry out supply chain management.	0.638	
10.	The process Supply Chain Management delivery is flexible and innovative.	0.606	
11.	There exists a link between internal supply chain processes and external supply chain processes.	0.566	
12.	The University subcontracts most of the major projects.	0.539	
	Factor Two - Flow management		
13.	SCM strategies are incorporated in the overall University strategy.	0.879	
14.	There exists a strategic plan for procurement department.	0.835	
15.	Shopping around every now and then for essential items is usually done.	0.754	
16.	There is willingness to share information to all concerned with supply chain issues	0.687	5.567
17.	Supplied products are acceptable to all parties (procurement dept, finance department and the user).	0.568	
18.	Orders are synchronized with the final demand	0.567	

	Supply Chain Management Practices.	Factor Loading	Sums of square factor loadings
19.	Supply chain performance is measured in order to facilitate greater understanding of supply chain management	0.522	
	Factor three- Quality management		
20.	Supply chain management documents are usually complete and accurate	0.740	
21.	There are rules that govern the disposal of obsolete items.	0.737	
22.	The departmental procurement plans/budgets are adhered to.	0.726	4.453
23.	There exists well documented procurement processes/ procedures.	0.653	
24.	All needed items are usually availed	0.564	
	Factor Four- Order fulfillment		
25.	Invoices are usually accurately done.	0.890	
26.	Orders are picked correctly and promptly.	0.835	
27.	There is a strategic supplier for goods and services.	0.652	4.359
28.	The Suppliers list is Continuously reviewed.	0.484	
29.	Information/Data is availed across all involve in the supply chain management	0.416	
	Factor Five- Review processes.		
30.	There are no error in the payment process	0.814	
31.	Excess inventory is sent back to the vendor.	0.751	4.252
32.	There exists a close partnership with customers.	0.654	
	Factor Six- Supply Chain Integration		
33.	There exists a close partnership with suppliers.	0.839	
34.	The university has few suppliers	0.787	
35.	Supply chain benchmarking is done against other institutions.	0.635	4.064
36.	Persons involved in the supply chain management process meet regularly.	0.564	
37.	There is Reduction of response time across the supply chain.	0.529	
	Factor Seven: Deliveries		
38.	There exists a list of all suppliers.	0.772	
39.	Non core activities are usually Outsourced.	0.675	3.786
40.	There are no delays to deliver items to the user	0.504	
41.	Supplier processes and deliveries are usually inspected.	0.498	
	Factor Eight : Plans/ Budgets		
42.	There exists procurement plans/budgets for each department.	0.916	2.131
	Factor Nine: Number of suppliers		
43.	The university has many suppliers	0.937	2.042
	Factor Ten : Supply chain members relationships		
44.	A stable relationship exists among supply chain members.	0.739	1.680
	Factor eleven : Managing suppliers		
45.	Suppliers are charged frequently.	0.586	1.474
46.	Payments to suppliers are made on time	0.438	

Source: Research data.

4.4 Benefits that can be derived from implementation and use of SCM practices.

The SCM continues to be adopted by organizations as the medium for creating and sustaining a competitive advantage (Ireland and Webb, 2007). Although many supply chain management efforts have failed to achieve the desired results, it has become a significant strategic tool for firms striving to achieve competitive (Tan 2002). Such a displacement is understandable considering the potential benefits of successful supply chain management (SCM). One of the main driving forces towards adoption of SCM entails the potential benefits from successful use and implementation of SCM practices (Balsmeier and Voisin, 1996). Overall, SCM potentially creates value for all members in the chain. However, such benefits vary in importance and degree among partnering chain members (Agrawal and Pak, 2001). Before investing money, time, and other resources into difficult implementations, most managers want to know if the results are worth the effort. Current study being an exploratory study on supply chain management practices in academic institutions fourteen benefits which are not mutually exclusive, nor collectively exhaustive were taken from literature and listed down. Respondents were ascent to rank the various benefits which they think the university can derive from the use and implementation of SCM practices on a likert scale.

The respondents ranking was analyzed by computing mean scores and standard deviation for the fourteen purposes listed. Most of the respondents felt that the greatest benefit that the university can derive from SCM practices is that it will be encouraged to rapidly adopt to changes in the external environment hence ranking this benefit as the highest with a mean score of 4.29, followed by having a more efficient inventory management and better customer service each having a mean score of 4.14 and 4.10 respectively. There was also low dispensation in respondents' answers to these benefits as they recorded low coefficient of variation scoring 15.01%, 15.82% and 17.07% respectively this shows that respondents really believed that the University can acquire this benefits if it effectively implemented and used SCM practices. These findings agree with Zheng et al, (2000) who stated that SCM spurs the organization to rapidly adapt to changes in the external environment thereby fostering a fluid and flexible organization. Respondents also felt that adoption of SCM practices will not do much in reduction of cost of purchasing inventories and fostering the spirit of shared ownership of problems and solutions among supply partners hence ranking them among the lowest with mean scores of 3.81 and 3.57 respectively. Least ranked was "SCM benefits can only be attained too far in the future" with a mean score of 3.38. This shows that the university will reap benefits of implementing and using SCM practices in the near future. This also got the lowest scores of coefficient of variation of 33.05%, 27.39% and 27.03% respectively. This agrees with the finds of Agrawal and Pak,

(2001) that benefits vary in importance and degree among partnering chain members. Table 4.2.1 summarizes the scoring obtained from the fourteen (14) benefits identified.

Table 4.4.1: Benefits of implementation and use of Supply Chain Management practices

	Benefits of implementation and use of Supply Chain Management practices	Mean	Std. Dev	Coefficient of Variation
1.	Will encourage the university to rapidly adopt to changes in external environment	4.29	0.644	15.01%
2.	It will result in more efficient inventory management system.	4.14	0.655	15.82%
3.	Will results in an improved customer service due to its customer focused approach	4.10	0.700	17.07%
4.	Will result to strong commitment and involvement by top management.	4.10	0.700	17.07%
5.	Will encourage the university to aim at constant and continuous improvement on a global scale	4.05	0.669	16.52%
6.	It will result in formation of strategic business alliances.	4.05	0.669	16.52%
7.	Will offer competitive advantage and priorities over the university competitors	3.95	0.669	16.94%
8.	It will lead to Promotion of inter-departmental cooperation and collaboration within the university	3.95	0.973	24.63%
9.	Will encourage the adoption of current process technologies in managing university supply chain operations.	3.90	0.831	21.31%
10.	It will Encourage information sharing, collaboration and cooperation among the university and its supply chain partners	3.90	0.768	19.69%
11.	It will result in reduction in operation costs.	3.86	0.854	22.12%
12.	Will results in the reduction of cost of purchasing inventories	3.81	1.030	27.03%
13.	It will fosters the spirit of shared ownership of the problems and solutions among supply chain partners	3.57	0.978	27.39%
14.	SCM benefits can only be attained too far in the future.	3.38	1.117	33.05%

Source: Research data.

4.5 Challenges affecting institutional readiness towards the implementation and use of SCM practices.

SCM is a long, complex and dynamic process. Its successful implementation needs to be associated with a thorough understanding of the concept itself (Whipple and Frankel, 2000). Its implementation is also seen as being closely dependent upon the ability to create, manage and reshape relationships between individuals, organizations and networks within the supply chain (Harland et al., 1999). It requires new organizational arrangements and culture (Neely, 1998) which calls for considerable commitment, resources and time to develop. It is important to recognize that SCM is complex and has proved to be difficult to implement. It is described as a multi-factor process, reliant upon close and long-term relationships within and between organizations (Saad et al., 2002). The current study sought to identify critical factors inhabiting the implementation and use of supply chain management practices, using identified challenges from literature. In total, thirty- two factors were used.

Respondents were asked to rank the impact of various challenges to institutional readiness towards the implementation and use of SCM practices at the University of Nairobi. A likert type scale was used with the highest impact scoring five (to a large extent) and the least scoring one (not at all). The mean and standard deviation of each factor was computed and summarized in table 4.3.1 the various challenges have been ranked using the mean score.

Table 4.5.1: Challenges affecting institutional readiness towards the implementation and use of SCM practices.

	Challenges affecting institutional readiness towards the implementation and use of SCM practices	Mean	Std. Deviation	Coefficient of Variation
1.	Not using supply chain management practices in the organization i.e. there is need for a new mind set	3.62	1.117	30.86%
2.	Lack of adequate resource to facilitate the implementation and use of supply chain management practice	3.57	1.248	34.96%
3.	Lack employee empowerment	3.57	1.287	36.05%
4.	Lack of adequate resources to ensure action is taken	3.52	1.030	29.26%
5.	Inflexible legacy systems (bureaucratic management structures)	3.48	1.167	33.53%
6.	Lack of management time	3.33	1.111	33.36%
7.	Use of inappropriate communication media to communicate, generate feedback and involve all employees.	3.33	0.966	29.01%
8.	Lack of focus by university management.	3.29	1.056	32.10%
9.	Mismatch between responsibility and authority	3.29	1.419	43.13%
10.	Inflexible IT systems	3.20	1.105	34.53%
11.	The new procurement act is affecting the implementation and use of supply chain management at the university.	3.14	1.195	38.06%
12.	Inadequate information technology (IT) systems	3.14	1.195	38.06%
13.	Lack of proactive review of supply chain management practice	3.14	1.236	39.36%
14.	Lack of common understanding in supply chain management objectives	3.14	1.315	41.88%
15.	Inconsistent approach to supply chain management	3.14	1.236	39.36%
16.	High staff turn over in the supply chain department	3.14	1.389	44.24%
17.	Lack of common supply chain management performance metrics	3.05	1.024	33.57%
18.	Lack of a common understanding for the need for continuous improvement	3.05	1.322	43.34%
19.	Incompatibility in supply chain management practice with the university policies.	3.05	1.161	38.07%
20.	Lack of support from senior management	3.05	1.499	49.15%
21.	Use of off-shelf systems that are largely inflexible	3.05	1.024	33.57%
22.	In adequate discussions (forums) on the appropriateness of supply chain management practice	3.00	1.265	42.17%
23.	Inability to quantify performance	3.00	1.183	39.43%
24.	Non-aligned supply chain measures	2.95	1.203	40.78%
25.	Failure to integrate supply chain management with review of the overall strategy	2.95	0.973	32.98%
26.	Supply chain management practice lacking credibility	2.95	1.244	42.17%
27.	Lack of enthusiasm in championing the practice of supply chain management	2.95	1.117	37.86%
28.	Lack of involvement of suppliers in the supply chain management process.	2.95	1.203	40.78%
29.	Inappropriate work culture	2.90	1.136	39.17%

	Challenges affecting institutional readiness towards the implementation and use of SCM practices	Mean	Std. Deviation	Coefficient of Variation
30.	Lack of user involvement in supply chain management process.	2.86	1.276	44.62%
31.	Failure to integrate supply chain management with the overall strategy development	2.86	1.195	41.78%
32.	Lack of skills in supply chain management	2.76	1.221	44.24%

Source: Research data.

The above analysis shows the ranking of the various challenges to supply chain management at the University of Nairobi most of the respondents felt that Supply chain management practices are not used in the University and there is need for a new mind set hence, ranking this the highest with a mean score of 3.62. "Lack of adequate resource to facilitate the implementation and use of supply chain management practice" and "Lack employee empowerment" were also among the highest ranking challenges both having a mean score of 3.57. These are closely followed by "Lack of adequate resources to ensure action is taken" and "Inflexible legacy systems (bureaucratic management structures)" having a mean score of 3.52 and 3.48 respectively. As such managerial and system issues seem to have a high weighing in contributing to failure of supply chain management. Similarly, respondents least rated "Inappropriate work culture" (2.90), "Lack of user involvement in supply chain management process" and "Failure to integrate supply chain management with the overall strategy development" (both having a mean score of 2.86) and "Lack of skills in supply chain management" (2.76). This implies the university has the skills to implement supply chain practices since most respondents felt that the work culture was appropriate, users were involved and supply chain management was integrated in the overall strategy.

This has some similarities with previous findings that found out that the resisting forces to supply chain management come both from the nature of the organization itself and the people that compose the organization. These barriers can be classified under one of two headings: "inter-firm rivalry" and "managerial complexity" (Park and Ungson, 2001). These resisting forces to supply chain management come both from the nature of the organization itself and the people that compose the organization. These barriers can be classified under one of two headings: "inter-firm rivalry" and "managerial complexity" (Park and Ungson, 2001). Further, from the coefficient of variation the study found out that most respondents agreed that use of inappropriate communication media to communicate, generate feedback and involve all employees which scored 29.01% and lack of adequate resources to ensure action is taken which scored 29.26%, was major hindrance to SCM practices implementation and use. While most were not sure if Lack of support from senior management which scored 49.15% and Lack of

user involvement in supply chain management process which scored 44.62% if they were really causing challenges in the impletation and use of SCM practices.

Factor analysis (Data reduction technique) was conducted to classify the various challenges in to fewer classes. Seven factors were identified with a total factor loading of 87.404%. Some of the challenges fell in more than one category (Rotated factor matrix value higher than 0.5) implementation issues with 7.303 and strategy issues with 6.315 were among the highest ranked. Results are shown in table 4.3.2 (For component matrix, total variance explained table, scree plot and rotated matrix tables see appendix III: Table Obj 3 i, ii and iii).

Table 4.5.2: Ranking of challenges affecting institutional readiness towards the implementation and use of SCM practices

	Challenges affecting institutional readiness towards the implementation and use of SCM practices		**Sums of square factor loadings**
	Factor One: Implementation issues		
1.	Lack of user involvement in supply chain management process.	0.888	
2.	Lack of enthusiasm in championing the practice of supply chain management	0.874	
3.	Lack of skills in supply chain management	0.872	
4.	Inability to quantify performance	0.713	
5.	Inflexible IT systems	0.701	
6.	Lack of involvement of suppliers in the supply chain management process.	0.672	
7.	Lack of common supply chain management performance metrics	0.642	7.303
8.	Supply chain management practice lacking credibility	0.642	
9.	Incompatibility in supply chain management practice with the university policies.	0.609	
10.	Lack of a common understanding for the need for continuous improvement	0.558	
11.	Lack of proactive review of supply chain management practice	0.552	
12.	Non-aligned supply chain measures	0.517	
	Factor Two: Strategy issues		
13.	Inconsistent approach to supply chain management	0.922	
14.	Failure to integrate supply chain management with the overall strategy development	0.883	
15.	Failure to integrate supply chain management with review of the overall strategy	0.845	
16.	Mismatch between responsibility and authority	0.773	6.315
17.	Lack of focus by university management.	0.670	
18.	Not using supply chain management practices in the organization (there is need for a new mind set)	0.645	
19.	Use of inappropriate communication media to communicate generate feedback, and involve all employees.	0.588	
	Factor Three: System issues		
20.	Lack of management time	0.846	
21.	Inadequate information technology (IT) systems	0.698	
22.	Inflexible legacy systems (bureaucratic management structures)	0.660	4.480
23.	Lack of common understanding in supply chain management objectives	0.584	

	Challenges affecting institutional readiness towards the implementation and use of SCM practices		Sums of square factor loadings
24.	High staff turn over in the supply chain department	0.538	
25.	Inappropriate work culture	0.531	
	Factor Four : Empowerment Issues		
26.	Lack of adequate resources to ensure action is taken	0.881	
27.	The new procurement act is affecting the implementation and use of supply chain management at the university.	0.865	3.480
28.	Lack employee empowerment	0.662	
	Factor Five : Support systems		
29.	Use of off-shelf systems that are largely inflexible	0.874	2.976
30.	Lack of support from senior management	0.799	
	Factor Six: Resource issues		
31.	Lack of adequate resource to facilitate the implementation and use of supply chain management practice	0.758	2.042
	Factor Seven: Forum discussions		
32.	In adequate discussions (forums) on the appropriateness of supply chain management practice	0.423	1.372

Source: Research data.

The above analysis shows the distribution of the various challenges of implementation and use of supply chain management practice at the University of Nairobi. Form the above implementation issues and strategy issues are the major hindrance to the use and implementation of SCM practices. It is important for the academic institutions to note that successful implementation of supply chain management has been credited with helping to cut costs, increase technological innovation, increase profitability and productivity, reduce risk and improves organizational competitiveness (Steven, 1989; Mentzer, 2001). Gadde and Håkansson (2001), states that Supply chain management has become a key element in any organizational corporate strategy. Its impact is driven by the contribution of the supply chain function to overall corporate performance and its interface relationships and the fact that large portion of the budget is spent on supply chain. The ultimate success of firm will depend on its managerial ability to integrate and coordinate the supply chain members (Drucker, 1998; Lambert and Cooper, 2000).

Respondents were further asked o state one initiative they would like the University of Nairobi management to pursue as a priority in order to improve the institutions supply chain management. A summary of the suggestions provided in the table 4.3.3.

Table 4.5.3: Respondents comments on priorities the university management should pursue to improve on.

1.	The university should empower staff involved in the supply chain management process
2.	Information technology should be used to carry out supply chain management
3.	Improve on supplier relations Involve suppliers

4.	Enhance SCM skills for staff involved in the supply chain management process
5.	Staff should be enlightened on SCM and its importance
6.	Ensure continuous improvement on SCM practices
7.	Training on procurement and disposal act 2005
8.	Reduction of bureaucracy/ bottlenecks/steps
9.	Shop for good quality goods and services at reasonable prices/ carry out market survey
10.	There is need to have a way of getting feedback from users. (Customer focus)
11.	There is need to review the procurement act and amend university procurement policies
12.	The university should embrace SCM philosophy and do away with Procurement philosophy

Source: Research data.

The above findings emphasize on the need to have effective and efficiently implemented supply chain management practices. This agrees with the opinion that SCM strategies are crucially important to the success of a firm. Its success is associated with the challenging and difficult development of a new culture based on shared learning, greater transparency and trust. It is important to associate the concept of SCM based on continuous improvement with performance measurement. Therefore, supply chain policies such as procurement and supplier selection have an important role in the SCM (Degraeve et al., 2000).

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction.

This chapter provides the summary of study findings, conclusions and recommendations arising. The chapter concludes with the limitations of the study and suggestions for further study.

5.2 Summary of study findings.

The study was based on an exploratory study design and sought to explore answers to three questions; what are the supply chain management practices at the University of Nairobi? What are the potential benefits the University of Nairobi can derive from effective and efficient implementation and use of supply chain management practices? And what are the challenges affecting institutional readiness that are facing the University of Nairobi in the implementation and use of supply chain management practices?

The findings show that the university is yet to fully embrace the supply chain management practices and most of the practices used are those borrowed from the procurement philosophy and are a requirement in the public procurement and disposal act 2005. This is not so much out of line looking at it from the view of Johannson (1994) who noted that SCM is an operations approach to procurement. This is observed from the ranking of the practices of inspecting supplier process and deliveries, having rules that govern the disposal of obsolete items, existence of documentation of the procurement process/ procedures and the existence of procurement plans/budgets for each department being ranked highest. Amongst the least ranked practices were holding safety stocks, having few suppliers, contacting users for feedback ant the use of e-procurement. Further analysis grouped the various challenges into eleven distinct factors

Various benefits were ranked in terms of the extent they can be derived by the academic institution from the implementation and use of supply chain practices. Encouraging the university to rapidly adapt to changes in external environment, resulting to more efficient management of inventory, resulting in improved customer service due to its customer focused approach, leading to more commitment and involvement by top management, encouraging the university to aim at constant and continuous improvement on a global scale and leading to formation of strategic business alliances were amongst the highly ranked benefits. Fortunately it was felt that benefits of using SCM practices can be attained in a short time hence being ranked lowest.

Challenges affecting institutional readiness towards the implementation and use of SCM practices identified from literature were subjected to evaluation with respect to academic institutions of higher learning amongst the highest ranked were supply chain management practices not used in the organization i.e. there is need for a new mind set, lack of adequate resource to facilitate the implementation and use of supply chain management practice, lack employee empowerment, lack of adequate resources to ensure action is taken Inflexible legacy systems i.e. bureaucratic management structures and lack of management time. However inappropriate work culture, lack of user involvement in supply chain management, failure to integrate supply chain management with strategy development and lack of skills in supply chain management were least ranked hence the university has the capacity to implement supply chain management practices. Further analysis grouped the various challenges into seven distinct factors.

5.3 Conclusions and Recommendations

Research findings have it that supply chain management continues to be adopted by organizations as the medium for creating and sustaining a competitive advantage (Ireland and Webb, 2007). Such a displacement is understandable considering the potential benefits of successful supply chain management. In light of the fact Public Universities now have to compete for scarce Government resources. There is no doubt that higher education is facing escalating expectations and demands while at the same time experiencing serious, economic shortfalls. Planning must therefore take cognizance of these challenges and respond to them adequately. The University is increasingly moving into realms of greater accountability and display greater sensitivity to the needs of the stakeholders. A terse duality arises whereby the institution is taking on greater responsibility while the level of its financial support from the Government is dwindling in real terms. (UoN Strategic plan, 2008-2013).

Consequently, since the university has the capacity and the skills required to implement and use supply chain management practices there is need for a proactive approach by management to come up with appropriate initiatives to address the identified challenges. This would greatly benefit the university in terms of rapidly adapting to changes in external environment, having a more efficient inventory management system, having a more customer focused approach when dealing with users hence resulting in improved customer service, ensuring more commitment and involvement by top management, encouraging the university to aim at constant and continuous improvement on a global scale and leading to formation of strategic business alliances.

From an academic perspective, this study may be an innovative way to implement the latest business management philosophy into the higher education environment. This connects education management with general business management. From a managerial perspective, this study provides education management a new way to understand how supply chain management impacts on the performance of a university. The study has led to the revelation of the limited reach of supply chain management activities in institutions of higher learning. It's worthy to note that supply chain management helps organizations to compete in the dynamic global market. The goal of supply chain management is to integrate activities across and within organizations for providing the customer value. It should also be useful to implement SCM in educational institutions. In fact, when supply chain researchers develop different kinds of models for helping business organization, they should not forget to develop the same quality of models for helping their institutions. Hence there is also need to introduce courses in supply chain management in this institutions since supply chain management (SCM) has become a very prominent concern for both large and small companies as they strive for better quality and higher customer satisfaction (Mentzer et al. 2000; Chopra and Meindle 2001).

There is need to benchmark or learn even from other organizations that have incorporated SCM in their operations and succeeded e.g. Nakumatt holdings and the flower industry in Kenya universities can also go a step further and even have collaborations with this company's in order to send their students to gain hands on experiences. Benchmarking of supply chain performance enables comparison between peer's supply chain and competitor's supply chain. This stimulates continuous improvement and hence allowing key performance indicators such as delivery speed, enhanced service quality and experience to be re-positioned and re-valued over time subject to market forces and dynamics. The university culture however is very different from that experienced in industry, but educational institutions are becoming increasingly proactive. The question arises as to whether this change is being forced by the external environment, or whether strategic planners in educational institutions are taking the lead. There are many lessons to be learned from industrial experience. The challenge for university planners over the next decade is to integrate these concepts, adapting them to their institution's culture, and utilize them effectively in their strategic planning process.

Since Supply chain management is a none-core activity for the universities the can even outsource this services. Furthermore, outsourcing is important to consider when the university can understand the indirect student services. Dietz and Enchelmayer (2001) stated that outsourcing services and programs selectively is an effective mean to provide strong educational

programs. However, SCM as one of the best practices enhances the chances of the organization to attain world class status. This is because it spurs the organization to aim for constant and continuous improvement on global scale (chase et al., 2001). Since the University of Nairobi aims to attain world class status which is evident from their vision "A world-class university committed to scholarly excellence". This is the way to go. Finally, transportation services play a key role in successful supply chain management and should be included in the management of the supply chain.

5.4 Study limitations

Like similar studies, current study is not without limitations. This includes data collection time and the unwillingness of respondents to participate. Respondents in senior positions posed the greatest challenge as they were unwilling to participate, citing lack of time to fill the questionnaire hence hampering the expected response rate. The findings could also be biased if used as a representation of higher education institutions since only one institution was used. The topic of study also posed a challenge as most people did not understand the SCM concept hence relying on people in the procurement department and those who had gained knowledge in the area though the course of their studies.

5.5 Suggestions for further study

The current study served the purpose of initiating research on the need of implementation and use of Supply chain management practices, benefits to be derived from this and challenges faced in the process. Findings from such studies will greatly contribute to supply chain literature, as well as the SCM practice across various sectors. A detailed study should be carried out to determine the relationship between SCM practice and other organizational aspects, amongst others; organizational performance, operational performance and management structures.

Secondly, the study found that there are different challenges that impair effective implementation and use of SCM practices. These challenges need to be explored in more depth to identify those that must be managed to ensure the highest level of success of a supply chain management.

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APPENDICES

Appendix i: Questionnaire

PART A: GENERAL INFORMATION

1. Designation: ……
2. College/section:……Faculty/School/Institute……
   Department……
3. For how long have you served in the current position? ..... Years.
4. Has your section/department/school/faculty/institute/college embraced a focused approach towards supply chain management?
   Yes [ ] No [ ]
5. If yes, to what extent are you satisfied with the various strategies used? On scale of 1 to 5 where 1= Highly unsatisfied, 2= Unsatisfied, 3=Neutral, 4= Satisfied, 5= Highly satisfied).

   Highly satisfied [ ]
   Satisfied [ ]
   Neutral [ ]
   Unsatisfied [ ]
   Highly unsatisfied [ ]

   Briefly explain your ranking above

   ……
   ……
   ……
   ……
   ……

   If your answer is no, briefly comment

   ……
   ……
   ……
   ……
   ……

PART B: SUPPLY CHAIN MANAGEMENT PRACTICES AT THE UNIVERSITY

How true are the following statements in the management of the supply chain at the university? Kindly tick (√) your choices in the spaces provided to indicate to what extent you agree with the statements on a scale of 1-5 (where 1= Not at all, 2= To some extent, 3=Neutral, 4=To a large extent, 5=To a great extent).

Various Supply Chain Management Practices at the University						
	Practices	**To a great extent**	**To a large extent**	**Neutral**	**To Some extent**	**Not at all**
1.	There exists a list of all suppliers.					
2.	There exist well documented procurement processes/ procedures.					
3.	Non core activities are usually Outsourced.					
4.	Suppliers are charged frequently.					
5.	The Suppliers list is Continuously reviewed.					
6.	There exists a list of prequalified suppliers that is approved and no alteration is done are at the departmental level.					
7.	There are rules that govern the disposal of obsolete items.					
8.	Shopping around every now and then for essential items is usually done.					
9.	Supplier processes and deliveries are usually inspected.					
10.	There is a strategic supplier for goods and services.					
11.	Supplier performance is measured and feedback given.					
12.	Persons involved in the supply chain management process meet regularly.					
13.	Information Technology (IT) is used to carry out supply chain management.					
14.	A stable relationship exists among supply chain members.					
15.	There exists a link between internal supply chain processes and external supply chain processes.					
16.	The process Supply Chain Management delivery is flexible and innovative.					
17.	Supplied products are acceptable to all parties (procurement dept, finance department and the user).					
18.	SCM strategies are incorporated in the overall University strategy.					
19.	Unnecessary steps in supply chain management have been done away with.					
20.	Supply chain performance is measured in order to facilitate greater understanding of supply chain management					
21.	Reduction of lead time variability is being done.					
22.	Users are usually contacted for feedback.					

Various Supply Chain Management Practices at the University						
	Practices	**To a great extent**	**To a large extent**	**Neutral**	**To Some extent**	**Not at all**
23.	There is Reduction of response time across the supply chain.					
24.	Adoption of lean inventory practices (e.g. just in time (JIT)) is encouraged.					
25.	Safety stock is usually held.					
26.	The university has few suppliers.					
27.	All needed items are usually availed.					
28.	There is use of E-procurement to manage the procurement process.					
29.	Supply chain benchmarking is done against other institutions.					
30.	There exists a strategic plan for procurement department.					
31.	There exists a close partnership with suppliers.					
32.	There exists a close partnership with customers.					
33.	Information/Data is availed across all involve in the supply chain management					
34.	The university has many suppliers.					
35.	Orders are synchronized with the final demand.					
36.	There are no errors in the payment process.					
37.	Excess inventory is sent back to the vendor.					
38.	Payments to suppliers are made on time.					
39.	There are no delays to deliver items to the user.					
40.	There exists procurement plans/budgets for each department.					
41.	The departmental procurement plans/budgets are adhered to.					
42.	Supply chain management documents are usually complete and accurate.					
43.	Orders are picked correctly and promptly.					
44.	Invoices are usually accurately done.					
45.	There is willingness to share information to all concerned with supply chain issues.					
46.	The University subcontracts most of the major projects.					

PART C: BENEFITS THAT CAN BE DERIVED FROM THE IMPLEMENTATION AND USE OF SUPPLY CHAIN MANAGEMENT PRACTICES.

Kindly tick (√) appropriately to indicate the level to which you agree or disagree with the listed benefits the university can derive from implementation and use of Supply Chain management Practice. On a scale of 1-5 (where 1= strongly disagree, 2= Disagree, 3=Neutral, 4=Agree, 5= strongly agree

Benefits that University of Nairobi can derive from the implementation and use of supply chain management practices.						
	Benefits	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
1.	It will result in formation of strategic business alliances.					
2.	It will result in reduction in operation costs.					
3.	It will result in more efficient inventory management system.					
4.	It will lead to Promotion of inter-departmental cooperation and collaboration within the university					
5.	It will Encourage information sharing, collaboration and cooperation among the university and its supply chain partners					
6.	It will fosters the spirit of shared ownership of the problems and solutions among supply chain partners					
7.	Will result to strong commitment and involvement by top management.					
8.	Will encourage the adoption of current process technologies in managing university supply chain operations.					
9.	Will results in an improved customer service due to its customer focused approach					
10.	Will encourage the university to aim at constant and continuous improvement on a global scale					
11.	Will encourage the university to rapidly adopt to changes in external environment					
12.	Will offer competitive advantage and priorities over the university competitors					
13.	Will results in the reduction of cost of purchasing inventories					
14.	SCM benefits can only be attained too far in the future.					

PART D: CHALLENGES AFFECTING INSTITUTIONAL READNINESS IN THE IMPLEMENTATION AND USE OF SUPPLY CHAIN MANAGEMENT PRACTICES.

Kindly tick (√) appropriately to indicate how each of the listed aspects impact on the implementation and use of supply chain practices at the university on a scale of 1-5 (where 1= Not at all, 2= To some extent, 3=Neutral, 4=To a large extent, 5=To a great extent.

Challenges affecting the implementation and use of supply chain management practices at the University of Nairobi.						
Aspects of the University in relation to supply chain management practices		**To a great extent**	**To a large extent**	**Neutral**	**To Some extent**	**Not at all**
1.	Lack of support from senior management.					
2.	Use of off-shelf systems that are largely inflexible.					
3.	Use of inappropriate communication media to communicate generate feedback, and involve all employees.					
4.	Failure to integrate supply chain management with overall strategy development.					
5.	Failure to integrate supply chain management with review of the overall strategy.					
6.	Inconsistent approach to supply chain management.					
7.	Mismatch between responsibility and authority.					
8.	Incompatibility the supply chain management practices with university policies.					
9.	Lack of common understanding of supply chain management objectives.					
10.	Lack of a common understanding for the need of continuous improvement.					
11.	Lack of user involvement in the supply chain management process.					
12.	Lack of involvement of suppliers in the supply chain management process.					
13.	Lack of proactive review of supply chain management practices.					
14.	In adequate discussions (forums) on the appropriateness of supply chain management practice.					
15.	Lack of common supply chain management performance metrics.					
16.	Lack of skills in supply chain management.					
17.	Lack of enthusiasm in championing the practice of supply chain management.					
18.	Inflexible IT systems.					
19.	Inability to quantify performance.					
20.	Supply chain management practice lacking credibility.					

Challenges affecting the implementation and use of supply chain management practices at the University of Nairobi.							
Aspects of the University in relation to supply chain management practices		**To a great extent**	**To a large extent**	**Neutral**	**To Some extent**	**Not at all**
21.	Inappropriate work culture.					
22.	Lack of management time.					
23.	Inflexible legacy systems (bureaucratic management structures).					
24.	Lack of focus by university management.					
25.	Not using supply chain management practices in the organization (there is need for a new mind set).					
26.	Inadequate information technology (IT) systems.					
27.	Non-aligned supply chain measures.					
28.	Lack employee empowerment.					
29.	Lack of adequate resource to facilitate the implementation and use of supply chain management practice.					
30.	Lack of adequate resources to ensure action is taken.					
31.	High staff turnover in the supply chain department.					
32.	The new procurement act is affecting the implementation and use of supply chain management practices at the university.					

8 State one priority initiative you would like the University management to pursue to improve the institutions Supply chain management.

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Thank you for your participation and Contribution

Appendix ii

UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS
MBA PROGRAM – LOWER KABETE CAMPUS

Telephone: 020-2059162
Telegrams: "Varsity", Nairobi
Telex: 22095 Varsity

P.O. Box 30197
Nairobi, Kenya

DATE 21/10/2008

TO WHOM IT MAY CONCERN

The bearer of this letter NGARI ANNE WANJIKU

Registration No: D61/7867/2006

is a Master of Business Administration (MBA) student of the University of Nairobi.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate if you assist him/her by allowing him/her to collect data in your organization for the research.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you

UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS
MBA OFFICE
P. O. Box 30197
NAIROBI

DR. W.N. IRAKI
CO-ORDINATOR, MBA PROGRAM

Appendix iii: Statistical Results Tables.

Research objective one: Supply Chain Management Practices at the University of Nairobi

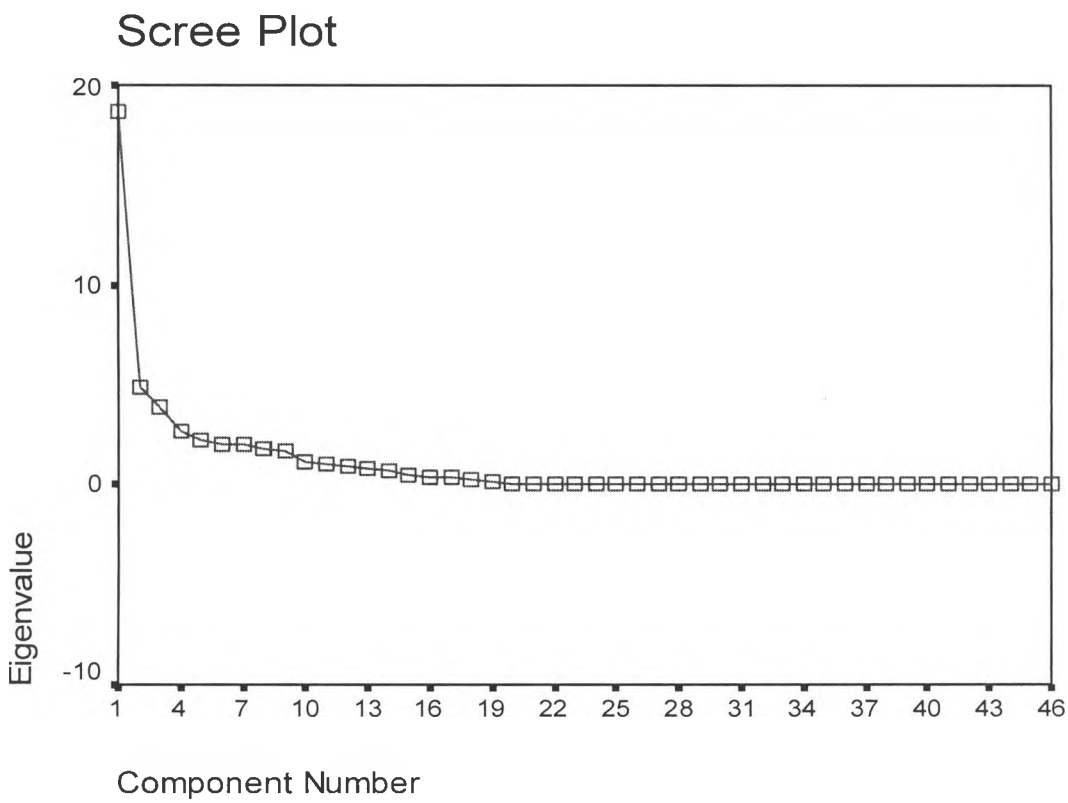
Table objective 1 i: Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.671	40.590	40.590	18.671	40.590	40.590	8.299	18.041	18.041
2	4.875	10.598	51.188	4.875	10.598	51.188	5.567	12.101	30.142
3	3.906	8.491	59.678	3.906	8.491	59.678	4.453	9.680	39.822
4	2.657	5.776	65.454	2.657	5.776	65.454	4.359	9.477	49.299
5	2.285	4.967	70.421	2.285	4.967	70.421	4.252	9.243	58.542
6	2.045	4.446	74.867	2.045	4.446	74.867	4.064	8.836	67.378
7	2.004	4.356	79.223	2.004	4.356	79.223	3.786	8.230	75.608
8	1.820	3.956	83.179	1.820	3.956	83.179	2.131	4.632	80.240
9	1.639	3.563	86.742	1.639	3.563	86.742	2.042	4.439	84.679
10	1.176	2.557	89.299	1.176	2.557	89.299	1.680	3.653	88.332
11	1.029	2.236	91.535	1.029	2.236	91.535	1.474	3.204	91.535
12	.941	2.045	93.581						
13	.763	1.660	95.240						
14	.650	1.413	96.654						
15	.453	.984	97.638						
16	.358	.779	98.417						
17	.316	.687	99.104						
18	.229	.499	99.603						
19	.183	.397	100.000						
20	2.028E-	4.408E-15	100.000						
21	8.708E-	1.893E-15	100.000						
22	6.900E-	1.500E-15	100.000						
23	5.915E-	1.286E-15	100.000						
24	5.572E-	1.211E-15	100.000						
25	4.805E-	1.045E-15	100.000						
26	3.717E-	8.080E-16	100.000						
27	3.486E-	7.578E-16	100.000						
28	2.797E-	6.079E-16	100.000						
29	2.120E-	4.609E-16	100.000						
30	1.688E-	3.669E-16	100.000						
31	1.305E-	2.837E-16	100.000						
32	4.449E-	9.671E-17	100.000						
33	-4.966E-	-1.080E-18	100.000						
34	-1.514E-	-3.290E-17	100.000						
35	-6.434E-	-1.399E-16	100.000						
36	-8.528E-	-1.854E-16	100.000						
37	-1.847E-	-4.015E-16	100.000						
38	-2.112E-	-4.592E-16	100.000						
39	-2.582E-	-5.613E-16	100.000						
40	-4.029E-	-8.758E-16	100.000						
41	-4.403E-	-9.571E-16	100.000						
42	-5.536E-	-1.204E-15	100.000						
43	-5.768E-	-1.254E-15	100.000						
44	-6.928E-	-1.506E-15	100.000						
45	-1.664E-	-3.617E-15	100.000						
46	-3.464E-	-7.531E-15	100.000						

Extraction Method: Principal Component Analysis

Source: Research data.

Table Objective 1 ii: Scree Plot



Source: Research data.

Table objective 1 iii: Rotated Component Matrix (supply Chain Practices)

		Component										
		1	2	3	4	5	6	7	8	9	10	11
1.	There exists a list of all suppliers.	0.23	0.01	0.12	0.19	0.20	0.10	0.77	0.24	0.06	0.19	0.24
2.	There exist well documented procurement processes/ procedures.	0.02	0.23	0.65	0.02	0.50	0.12	0.27	0.02	0.06	-0.18	-0.01
3.	Non core activities are usually Outsourced.	0.48	-0.08	0.21	-0.04	0.01	0.27	0.67	-0.02	0.20	-0.21	-0.05
4.	Suppliers are charged frequently.	0.42	-0.22	0.19	0.23	0.26	0.17	0.24	-0.02	0.05	0.06	0.59
5.	The Suppliers list is Continuously reviewed.	0.12	0.27	0.34	0.48	0.47	0.17	0.47	-0.03	-0.09	0.10	-0 24
6.	There exists a list of prequalified suppliers that is approved and no alteration is done are at the departmental level.	0.81	0.18	0.08	0.07	0.23	0.02	0.05	0.25	-0 16	-0.15	0.25
7.	There are rules that govern the disposal of obsolete items.	0.07	0.23	0.74	0.27	0 03	-0.07	-0.17	0.21	-0.13	0.30	0.21
8.	Shopping around every now and then for essential items is usually done.	-0.23	0.75	-0.01	0.15	0.25	-0.14	0.14	-0.20	-0.21	0.11	-0.20
9.	Supplier processes and deliveries are usually inspected.	0 12	0.39	0.26	0.46	0.27	0.05	0.50	-0.20	0.19	0.08	0.12
10.	There is a strategic supplier for goods and services.	0.30	0.23	-0.09	0.65	0.50	-0.02	-0.07	0.15	0.20	0.13	0.12
11.	Supplier performance is measured and feedback given.	0.72	-0.04	0.28	0.34	0.02	0 22	-0.24	0.16	-0.17	0.08	-0.15
12.	Persons involved in the supply chain management process meet regularly.	0.47	0.25	0.09	0.33	0.29	0.56	-0.02	0.03	0.16	-0.13	0.04
13.	Information Technology (IT) is used to carry out supply chain management.	0.64	-0.07	0.08	0.08	0.11	0.42	0.27	0.24	-0.16	0.36	-0.21
14.	A stable relationship exists among supply chain members.	0.01	0.17	0.24	0.16	0.36	0.15	0.15	0.29	0.16	0.74	0.07
15.	There exists a link between internal supply chain processes and external supply chain processes.	0.57	0.13	0.10	0.33	0.44	0.16	0.32	0.07	-0.22	0.25	0.08
16.	The process Supply Chain Management delivery is flexible and innovative.	0.61	-0.08	0.23	0.39	0.49	-0.08	-0.13	-0.10	0.07	0.23	0.08
17.	Supplied products are acceptable to all parties (procurement dept, finance department and the user).	0.20	0.57	0.59	0.40	0.18	-0.13	-0.09	-0.03	0.11	0.07	-0.03
18.	SCM strategies are incorporated in the overall University strategy.	0.11	0.88	0.19	0.12	0.16	0.09	-0.03	0.01	0.15	-0.06	0.13
19.	Unnecessary steps in supply chain management have been done away with.	0.78	0.32	0.22	0.05	0.05	0.31	0.05	0.06	-0.03	-0.24	0.00
20.	Supply chain performance is measured in order to facilitate greater understanding of supply chain management	0.51	0.52	0.00	0.39	0.10	-0.09	0.03	0.34	0.11	0.13	-0.23
21.	Reduction of lead time variability is being done.	0.66	0.50	0.16	-0.04	0 16	0.31	0.29	-0.16	-0.01	0.10	-0.08
22.	Users are usually contacted for feedback.	0.72	0.13	0.27	0.27	0.11	0.10	0.22	0.16	0.13	0.15	0.08
23.	There is Reduction of response time across the supply chain.	0.32	0.36	0.22	0.19	-0.03	0 53	0.53	-0.23	0.06	0.18	0.02
24.	Adoption of lean inventory practices (e.g. just in time (JIT)) is encouraged.	0.82	0.02	-0.01	0.17	0.04	0.16	0.31	-0.06	0.14	-0.14	0.21
25.	Safety stock is usually held.	0.72	-0.08	0.17	0.21	0.45	0.16	0.21	0.02	0.07	0.06	-0.08
26.	The university has few suppliers.	0.23	0.10	-0.07	0.12	0.08	0.79	0.15	0.26	-0.32	0.04	0.20
27.	All needed items are usually availed.	0.02	0.12	0.00	0.10	0.05	0 01	0.17	-0.07	0 94	0.09	0.02
28.	There is use of E-procurement to manage the procurement process.	0.67	0.32	0.03	-0.03	-0.23	0.06	0 29	-0.20	-0.14	0.29	0.17
29.	Supply chain benchmarking is done against other institutions.	0.41	0.44	0.21	0.07	-0.04	0.64	0.18	-0 21	-0 06	-0.22	0.17
30.	There exists a strategic plan for procurement department.	0.28	0.84	0.00	0.15	-0.27	0.23	-0.03	0.13	0.07	0.10	-0.04
31.	There exists a close partnership with suppliers.	0.14	0.01	0.22	0.08	0.22	0.84	0 16	-0.19	0.15	0.15	-0.14
32.	There exists a close partnership with customers.	0.11	-0.14	0.12	0.41	0.65	0.39	0.02	0.20	-0.09	-0.05	-0.29
33.	Information/Data is availed across all involve in the supply chain	0.32	0.26	0.30	0.42	0.12	0.32	0.30	0.02	-0.47	0.12	0.20

	management											
34.	The university has many suppliers.	0.11	0.44	0.56	0.26	0.43	0.30	0.17	0.00	-0.16	0.14	-0.02
35.	Orders are synchronized with the final demand	0.08	0.57	0.49	0.19	0.28	0.02	0.15	0.03	-0.25	0.17	0.06
36.	There are no errors in the payment process.	0.04	0.29	0.02	-0.03	0.81	0.00	0.05	0.30	0.05	0.22	0.18
37.	Excess inventory is sent back to the vendor.	0.36	-0.09	0.35	0.13	0.75	0.12	0.06	-0.28	0.02	0.01	0.14
38.	Payments to suppliers are made on time.	0.33	0.12	0.42	0.41	0.20	0.06	0.30	0.13	-0.25	0.17	0.44
39.	There are no delays to deliver items to the user.	0.48	0.23	-0.09	0.13	-0.10	0.34	0.50	-0.24	-0.35	0.25	-0.07
40.	There exists procurement plans/budgets for each department.	0.17	-0.01	0.19	-0 11	0.10	-0.03	0.05	0.92	-0.08	0.14	0.01
41.	The departmental procurement plans/budgets are adhered to.	0.32	-0.24	0 73	0.10	0.03	0.24	0.21	0.23	0.15	0.01	-0.21
42.	Supply chain management documents are usually complete and accurate.	0.33	0.17	0.74	0.17	0.03	0.22	0.28	-0.02	-0.01	-0.01	0.17
43.	Orders are picked correctly and promptly.	0.20	0.15	0.31	0.84	0.07	0.10	0.18	-0.14	-0.01	-0.05	0.08
44.	Invoices are usually accurately done.	0.18	0.21	0.19	0.89	0.03	0.22	0.12	-0.05	0.01	0.08	0.04
45.	There is willingness to share information to all concerned with supply chain issues.	0.13	0.69	0.17	0.11	-0.09	0.21	0.60	0 09	0.08	-0.04	0.02
46.	The University subcontracts most of the major projects.	0.54	-0.36	0.08	0.07	-0.27	0.50	0.21	0.19	0.07	0.13	0.22

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 21 iterations.

Source: Research data.

Research objective 3: Challenges affecting institutional readiness for implementation and use of SCM practices)

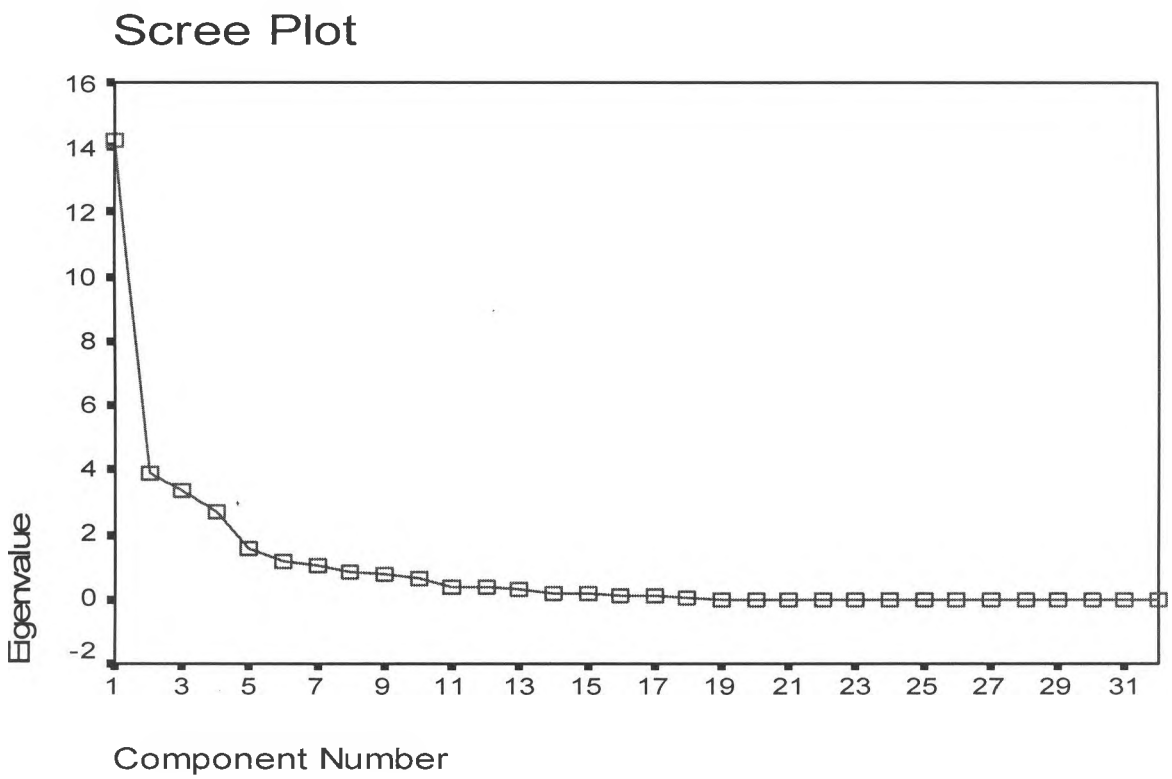
Table objective 3 i: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.206	44.395	44.395	14.206	44.395	44.395	7.303	22.821	22.821
2	3.923	12.259	56.654	3.923	12.259	56.654	6.315	19.735	42.555
3	3.328	10.400	67.054	3.328	10.400	67.054	4.480	14.001	56.557
4	2.731	8.533	75.587	2.731	8.533	75.587	3.480	10.875	67.432
5	1.563	4.886	80.473	1.563	4.886	80.473	2.976	9.302	76.733
6	1.198	3.745	84.218	1.198	3.745	84.218	2.042	6.382	83.115
7	1.020	3.186	87.404	1.020	3.186	87.404	1.372	4.289	87.404
8	.859	2.684	90.087						
9	.764	2.386	92.474						
10	.662	2.068	94.542						
11	.397	1.240	95.782						
12	.368	1.149	96.931						
13	.300	.937	97.868						
14	.209	.654	98.522						
15	.200	.624	99.146						
16	.143	.448	99.594						
17	.087	.272	99.865						
18	.043	.135	100.000						
19	9.917E-16	3.099E-15	100.000						
20	5.757E-16	1.799E-15	100.000						
21	4.497E-16	1.405E-15	100.000						
22	2.739E-16	8.559E-16	100.000						
23	2.106E-16	6.582E-16	100.000						
24	6.931E-17	2.166E-16	100.000						
25	-3.827E-17	-1.196E-16	100.000						
26	-6.577E-17	-2.055E-16	100.000						
27	-1.133E-16	-3.540E-16	100.000						
28	-1.902E-16	-5.944E-16	100.000						
29	-2.852E-16	-8.911E-16	100.000						
30	-3.463E-16	-1.082E-15	100.000						
31	-4.799E-16	-1.500E-15	100.000						
32	-9.136E-16	-2.855E-15	100.000						

Extraction Method: Principal Component Analysis

Source: Research data.

Table objective 3 ii: Scree Plot



Source: Research data.

Table objective 3 iii: Rotated Component Matrix (Challenges to institutional readiness for the implementation and use of SCM practices))

		Component						
		1	2	3	4	5	6	7
1.	Lack of support from senior management.	0.23	0.29	0.05	-0.18	0.80	0.10	-0.11
2.	Use of off-shelf systems that are largely inflexible.	-0.09	-0 01	0.09	0.32	0.87	-0.02	0.11
3.	Use of inappropriate communication media to communicate generate feedback, and involve all employees.	-0.23	0.59	-0.26	0.36	0.33	0.17	0.29
4.	Failure to integrate supply chain management with overall strategy development.	0.10	0.88	0.12	0.22	0.13	-0.20	0.08
5.	Failure to integrate supply chain management with review of the overall strategy.	0.12	0.85	0.34	0.10	0.22	-0.06	0.08
6.	Inconsistent approach to supply chain management.	0.11	0.92	0.19	0.06	-0.09	-0.06	-0.06
7.	Mismatch between responsibility and authority.	0.20	0.77	0.13	-0.25	0.20	0.34	0.16
8.	Incompatibility the supply chain management practices with university policies.	0.61	0.61	0.18	0.10	-0.26	0.06	0.00
9.	Lack of common understanding of supply chain management objectives.	0.47	0.37	0.58	-0.13	-0.17	0.40	0.06
10.	Lack of a common understanding for the need of continuous improvement.	0.56	0.20	0.65	0.18	-0 19	0.29	0.04
11.	Lack of user involvement in the supply chain management process.	0.89	0.11	0.24	-0.11	0.22	0.02	-0.05
12.	Lack of involvement of suppliers in the supply chain management process.	0.67	0.50	-0.03	-0.25	0.00	0.22	0.01
13.	Lack of proactive review of supply chain management practices.	0.55	0.55	0.28	0.00	0.01	0.39	0.22
14.	In adequate discussions (forums) on the appropriateness of supply chain management practice.	0.29	0.46	0.38	-0.10	0.43	0.21	0.42
15.	Lack of common supply chain management performance metrics.	0.64	0.31	0.57	0.04	-0.05	0.16	0.13
16.	Lack of skills in supply chain management.	0.87	0.15	0.13	0.14	-0.03	-0.04	0.21
17.	Lack of enthusiasm in championing the practice of supply chain management.	0.87	0.19	0.25	-0.12	0.21	0.05	0.04
18.	Inflexible IT systems.	0.70	-0.06	0.18	-0.20	0.55	0.13	-0.01
19.	Inability to quantify performance.	0.71	0.08	0.10	0.07	0.15	0.37	-0.38
20.	Supply chain management practice lacking credibility.	0.64	0.21	0.47	0.23	-0.17	0.26	0.28
21.	Inappropriate work culture.	0.41	0.36	0.53	0.12	0.17	0.06	0.44
22.	Lack of management time.	0.11	0.13	0.85	0.26	0.19	0.17	0.16
23.	Inflexible legacy systems (bureaucratic management structures).	0.38	0.20	0.66	0.09	0.49	0.01	-0.08
24.	Lack of focus by university management.	0.32	0.67	0.22	-0.34	0.06	0.21	-0.14
25.	Not using supply chain management practices in the organization (there is need for a new mind set).	0.45	0.65	0.07	0.13	0.01	0.20	0.10
26.	Inadequate information technology (IT) systems.	0.41	0.40	0.70	0.05	0.05	0.08	-0.36
27.	Non-aligned supply chain measures.	0.52	0.32	0.20	0.38	-0.08	0.16	0.50
28.	Lack employee empowerment.	0.12	0.20	0.24	0.66	-0.02	0.51	0.24
29.	Lack of adequate resource to facilitate the implementation and use of supply chain management practice.	0.36	-0.03	0.32	0.30	0.23	0.76	0.01
30.	Lack of adequate resources to ensure action is taken.	-0.10	0.15	0.05	0.88	-0.27	0.12	0.03
31.	High staff turnover in the supply chain department.	-0.03	0.06	0.54	0.63	0.24	-0.32	0.05
32.	The new procurement act is affecting the implementation and use of supply chain management practices at the university.	0.05	-0.14	0.11	0.86	0.31	0.04	-0.08

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 10 iterations.