

EFFECT OF LEAN PRACTICES ON OPERATIONAL PERFORMANCE OF VIHIGA  
COUNTY GOVERNMENT, KENYA

BY

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## DECLARATION

This report is original and has never been done in the form and nature presented here in Maseno University or any other university in Kenya and in the world.

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This is to declare that this report has been submitted for examination with my approval as the university supervisor.

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## ABSTRACT

With the Promulgation of the new constitution in 2010 in Kenya, most government functions were decentralized. Services that were initially offered from a centralized position were devolved and brought to the counties, an action that was largely attributed with efficiency and effectiveness in operations within the counties. With this in place, challenges like corruption, nepotism and poor task assignments and massive inefficiencies are still being faced during the dispensation of services at the county levels. Lean practice, majorly the reason for operational success in the Toyota Production system in Japan during tough economic times and industrial revolution in the early 1980's is one of the managerial approaches that were initiated with the aim of elimination of wastages in the operational activities within Vihiga county government. However, the challenges are still evident with cases of malpractices in procurement processes and operational activities still being reported. For instance, questionable purchases, overpriced construction projects and the withdrawal Labour citing dishonored debts by the county government. This poses a major question on the effectiveness of lean practices. The purpose of this research was therefore to study the effect of lean practices on operation performance of Vihiga county government in Kenya. The specific objectives were to establish the extent of lean practices within Vihiga County, establish the state of operational performance and to determine the relationship between lean practices and operational performance at vihiga county government. The study was guided by a conceptual framework where the independent variable was lean practices and the dependent variable was operational performance. The study adopted both descriptive and the correlation designs. The study population was eighty staff drawn from the procurement and the operations departments; a pilot study was done before the actual research. Primary data was collected using questionnaires. validity of the study was ascertained through an expert opinion while the reliability was ascertained through split half method. Descriptive analysis revealed that the level of lean practices within the county was rated by a weighted mean of 2.81, while the operational performance of the county government was illustrated by a weighted mean of 2.56. Correlation analysis revealed there was a weak significant relationship between lean practice and operational performance ( $r=0.237$ ,  $p=0.033$ ) implying that as lean practice is implemented, operational performance also increases. The study concluded that there is significant relationship between lean practice and operational performance. The study recommended that county government should implement lean practice since it is positively related to operational performance. The study may be useful in policy makers in relation to operations and lean practices.

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## LIST OF ABBREVIATIONS

TQM .....	Total quality management.
J.I.T.....	Just in time
H.R.M.....	Human resource management
T.A.T.....	Turnaround time
SME.....	Small and medium enterprises
LE.....	large enterprises
TPS.....	Toyota Production System.



## **OPERATIONAL DEFINITION OF TERMS.**

**E-governance;** the use of information and communication technology by government entities to improve on their operational efficiency and effectiveness in service delivery

**Variability;** variability is any deviation in a service or product that creates unnecessary costs.  
In production;

**Flexibility;** systematic agility that will enable organizations to meet customer demands at reasonable costs.

**Waste-** any processes that consume the organizational resources but are none value adding to the core objectives of the organization.

**Lean practice-**The identification, reduction and elimination of processes that consume the resources of the organization but are not value adding to the organization core objectives through a continuous improvement process.

**Operational performance-**performance in service delivery and customer service against the set goals and objectives in the operational activities.

**County government.-**Devolved government units with functions previously from the national government and headed by governors

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## **CHAPTER ONE**

### **INTRODUCTION.**

This chapter provides an overview of the background of the study, statement of the problem, the objectives of the study, the research questions, and scope of the study and significance of the study.

#### **1.1 Background of the study**

The application of innovative management approaches such as lean practices in daily operation of organization has led to increased lead times, customer satisfaction, continuous improvements, JIT production and a massive waste reduction within the systems. The practice of lean originated from Toyota that used names such as "Just-in-Time" manufacturing or Toyota production system (TPS) in the 1950s. The main goal of TPS was to reduce costs and improve productivity by eliminating wastes or non-value adding activities (Womack et al 1991). Lean practices entails the creation of more value to customers and stakeholders with fewer resources and this idea has been inculcated into the county government set up and the public sector to improve on their operational performances, facilitate continuous improvements and address some of the challenges they face in their daily activity and service delivery.

Miao, *et al* (2011) researching on lean public management in China, citing Ukpata and Olukotun (2008) found that public administrations in developing countries are under intense pressure to improve on effectiveness and efficiency in providing more and better services to the people. They further advocated for the introduction of e-government concept that aimed to boost information dissemination, enhance service delivery and facilitate citizen participation in governance with a low cost manner. Citing Lan, (2004) they concluded that e-governance was no longer a technological term or event but rather a profound revolution. However, their work failed to deliberate on the effects the introductions of E-government techniques would have on the operational performance of their local government.

With the increasing public demand for greater and quality services at lower costs, no organization has the luxury of being wasteful. National and county governments are no exceptions. Governments are asked to avail on-demand accessibility to public records and ability to retrieve and complete forms online, equipment and infrastructure that enables

electronic payments all with the same or even fewer resources than the ones they used in the past. County officials and public servants must also pay a great deal of attention on how they deal and operate because their budgets and expenditures are public documents that are open for scrutiny by the general taxpayers and the press. Organizations can achieve these objectives through a structured approach to process improvement. With this kind of mindset, county governments implement structured document management and information management solutions to improve on efficiencies, reduce lead times, eliminate Labour intensive paper based processes and satisfy customer demands (Xerox global services, 2004). However, the report pointed at application of lean as a guaranteed success in waste management in the organization just as per the literature in lean practices suggest but failed to deliberate on the holistic steps to be taken to ensure that the practice of lean in the organization is successful.

Wael, (2014) pointed out that the Governments around the world, whether in developing or developed countries, strive to deliver to their citizens' better education, healthcare, transportation services and many more. They are well aware that people are impatient and expect to see quick change and development on the ground. But the scarcity and limitation of required financial and economic resources necessary to meet such public expectations hinder the government's efforts in such attempts. To tackle such challenges, governments should adopt the lean philosophy, long used in the private sector to enable them find the strategic fit between cost cutting in the public service and at the same time increasing the quality of the services provided to the customers. Though the study was majorly based on the items, which in the Kenyan context have not been devolved, like education and major transport works.

Bearing in mind the lack of knowledge on the application on lean approaches in the public sector, there is urgency for a deeper understanding on its application on the same (public sector) and how it fits into that context. In order to do this; a discussion on the current trends and future challenges in public management is needed. Therefore, there is a need to go deeper into the content and context of change when it comes to lean. (Drozt, 2014)

Behrouzi and Wong, (2010) found that many organizations around the world had attempted to rollout the lean practices within their systems but had failed due to a lack of clear understanding of the same concept and also failing to undertake a lean performance

measurement. Basically, they found out that it's not possible to manage lean without measuring its performance in the organization.

Despite the intensive research on lean application, the Authors failed to deliberate on the effects its application would have on the employees, and clearly they failed to inform us on the challenges that an organization would face in the implementation of the same, and how the employees can be managed to streamline their interest with that of the organization to achieve the set goals and objective.

## **1.2 Statement of the problem.**

With the promulgation of the new constitution in 2010, there came the introduction of county governments in Kenya for the first time in the country's history. The county governments were established to ensure services are taken closer to the people so as to encourage equality and equity in regional development throughout the county. This was also meant to encourage growth and development in the traditionally marginalized regions like some parts of the coast and the northern part of the country and also encourage equal opportunities and create employment to different people in the counties. The county governments are allocated huge sums of money in the annual budgets to facilitate their operations and hence a lot of expectation is placed on them to deliver on performance and superb service delivery to the locals. However, a common trend throughout the forty seven counties suggests otherwise and is a display of dismal operational performances. For instance some counties portray a lot of irresponsibility when it comes to procurement of goods and services; for instance, we had cases of purchase of wheelbarrows at price higher than the known market rate per single unit, construction of institutional gates at exaggerated prices and the constructions of public amenities at inflated price. More so, their focus is more on recurrent expenditure rather than the development expenditure within the county. Further, county governments might have inherited many employees from the National government and hence making them spend more on recurrent expenditure. Other discrepancies like delayed or even nonpayment of contractors and service providers, as evident with the total downing of tools by service providers in the hospital and other crucial service providers citing an accumulated unpaid and Nepotism are the norms in the county government. Most county governments like Vihiga County have therefore placed systems in place to ensure that there is progress on the same. One such strategy is the introduction of Lean practices in their systems to ensure continuous

performance improvement in their daily Operations and service delivery. Despite these interventions, not much improvement has been recorded in the county's operational performance. This research was therefore designed to study the effect of the lean practices on the operational performance of the county government.

### **1.3 Objectives of the study.**

The main objective of the study was to determine the effect of lean practices on operation performance of Vihiga county government in Kenya.

#### **1.3.1 Specific objectives of the study.**

- i. To establish the extent of lean practices within Vihiga county government
- ii. To establish the state of operational performance of Vihiga county government
- iii. To determine the relationship between lean practices and operational performance in Vihiga county government.

### **1.4 Research questions/hypotheses**

Objectives one and two were addressed by the following research questions:

- i. What is the extent of lean practices within the county government?
- ii. What is the state of the operational performance of the Vihiga county government?

Objective three was addressed by the following hypothesis:

- iii there is no significant relationship between lean practices and operational performance of Vihiga county government

### **1.5 Scope of the study.**

The study covers and is limited to Vihiga County; target population being mainly the staff undertaking operations management in the county operations and the ones in the procurement department. Thus the ability to generalize the entire Vihiga county staff and other counties in Kenya within the same context is severely limited.



### 1.6 Significance of the study.

The findings of this study would be of much importance to the already existing county governments and the national government as a whole, who intend to improve on the lean practices within their local government setups with an aim of benefitting from the entire attributes associated with the application of lean practices. The same would be used by other organizations that would be willing to increase their efficiency and effectiveness in service delivery and provide a one stop shop service criteria to their customers and general stakeholders, which will lead to minimal wastages, reduced lead times and less reworks of their products. Students studying government and organizational operational performance as a whole can also use the findings of the same research.

### 1.7 Conceptual framework.

INDEPENDENT VARIABLE

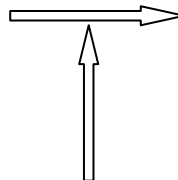
LEAN PRACTICES

- Elimination of wastages
- Continuous improvements
- corrections and recalls

DEPENDENT VARIABLE

OPERATIONAL PERFORMANCE

- Lead Times
- customer satisfaction
- accountability



INTERVENING VARIABLES

- Management styles
- Employee acceptance to change
- Flexibility and Variability.

**Title;** Effects of lean practices on the operational performance of Vihiga county government.

**Source:** Researcher, (2016)

The lean practice entails elimination of wastages within the internal processes of an organization. With the practice in place, the turnaround times for service delivery within the county will drastically reduce since the speed at which things would be done to meet customer

demands and the same time there would be a reduction of unnecessary procedures within the internal processes. Increased lead times to meet customer demands at the specified time and in the requested manner would lead to an improved customer satisfaction, a conclusion that can be easily made from the customer feedback. With this in place, Accountability can easily be done on the resources that were employed towards service delivery, again drastically reducing the chances of corruption within the processes, corruption being a thorn in the flesh within the county processes.

With lean practice comes the aspect of *Kaizen*, which otherwise denotes continuous improvement within the internal processes and the service delivery within the county government. Customers and patients going into a county facility and hospital respectively should be assured of a different experience in service delivery every time they visit these facilities, different in the fact that the services offered are better than the ones they received the last time they were there, an improvement in lead times, giving the customers a better experience and sealing all the loop holes to enhance effective accountability, will lead to an improved operational performance of the organization.

With lean, the aspect of “doing the right thing the first time” is introduced to avoid the instances of corrections and recalls after the service of good has reached its ultimate point. Within the internal processes, there is minimum or no corrections that are done. This will increase the TAT in which services are offered, which in turn leads to increased customer satisfaction and proper utilization of the available scarce resource in service delivery, this being a clear pointer in improved operational performance of the organization.

The practice of lean in an organization, alongside factors such as the management styles in the organization, employee’s willingness to accept and embrace the changes without any fear and the organizations flexibility and variability towards service delivery will all lead and guide the organization toward an achievement of improved operational performance.

## CHAPTER TWO

### LITERATURE REVIEW

This chapter reviews the theoretical knowledge around the application of lean principles in the public sector and the empirical research works from different studies on the same regard.

#### 2.1 Theoretical literature review.

##### 2.1.1 The lean practices

A lean practice is designed to eliminate waste, variability and inflexibility in various systems (Bhatia and Drew, 2006). The concept of lean and lean practices started from the Japanese automakers, Toyota who had been thriving in the automakers competition for decades despite the hard economic times during the world war two. The concept of lean has developed through the years and is now considered to be valid for structuring and development of organization (Hook and Stehn, 2008).Womack and Jones (1996) defined lean as the specification of value, identification of value stream for each product, product flow without interruption, customer pulling value from the producer and organization pursuit for perfection.

Hook and Stehn, (2008) stated that there was a lack of pronounced personal focus in the five lean principles, since according to them, citing Liker (2004), Veech (2004) the principles were misleading because individuals are an essential part of lean culture and hence cultural aspects should be found in all the attempts to approach lean in any discipline. Mainly because the five principles, which entails specification of value, identification of value stream of each product, product flow without interruption, customer pulling value from producers and pursue of perfection, failed to emphasize the individuals and their creativity. According to Bhatia and Drew (2006), improving an operating system through the configuration of assets, material resources and staff, a lean approach can cut cost dramatically, bringing improvements in terms of savings more so, lean aims to optimize costs, quality and customer service constantly, which does so by engaging and equipping employees to focus on the creation and delivery of value in the eyes of the customer and totally eliminating what does not contribute to achieving this goal. They concluded that lean is about making a process or operation 'fighting fit' and not about thinning it bone.

Bhatia and Drew (2006), Governments around the world want to deliver better education, better healthcare services, better pensions and better transportation and infrastructure. They are well aware that the impatient electorates expect to see change, and fast. Yet the resources required to meet such demands are enormous. The need to get value for money in all government departments is therefore under the spotlight particularly in the developed economies. Cost cutting may weaken the services being offered and hence the need to apply lean practices arises. Leaders in the public sector and governments have therefore resorted to the new techniques that were long used in the private sector, from the repair of broken vehicles to the processing of income tax and this has shown that it cannot only change the governments and public service but also improve them for the better.

Alarcon and Ashley (1999) suggested the aspect of analytical power and campaigned for the use of simulations and models of lean practices before the actual procedure of lean practices is introduced in the system to increase the chances of its success. The same approach, according to the researchers would still be used to facilitate participants of trainings sessions in order to increase its chances of success in the organization and therefore aligning the culture of employees with that of the organization to achieve the set goals and objectives.

### **2.1.2 Operational performance.**

Voss *et al* (1997) pointed out that operational performance in an organization could be defined as the measurable aspects of its internal processes. Mostly, it encompasses the defect rates and production reliability, the production cycle time associated with a particular line of production time delivery of the same, cost of quality and scrap minimization, productivity and the inventory within the organization.

According to Shah and Ward (2003), the multi-dimensional measurement of operational performance combines changes in cost, cycle time, customer lead times, productivity and the quality of the services offered. Therefore, factors such as the expenses that are incurred in quest for better service delivery, time taken to complete the internal processes within the county government, the productivity of the service providers and the workers of the county and the quality of the service offered based on the customer feedback dictates the level of operational performance of the organization.

Krause *et al* (1998) also proposed the involvement and development of all stakeholders directly associated with an organization would be positively related to the operational performance of the same organization. In the local government context, involvement of all the relevant stakeholders from the suppliers of the county government to the residents of the same county to take part in open forums where new ideas on service delivery would have an impact on its performance.

Shah and Ward (2007) pointed out that lean production and practices is a multi-dimensional approach that encompasses a wide variety of management practices, including JIT production, quality systems, work teams, supplier management in an integrated system all that aid and point to continuous operational performance of an organization.

### **2.1.3 The theory of constraints.**

The theory of constraints logic driven approach focuses on system improvements, just as the lean practices, that bases its policies on continuous improvement. The theory which was created by Dr. Eli Goldratt and published in 1984 in his book “the goal” views the system as a chain of interdependent links that work together towards the primary goal of transforming inputs into improved visible output that enhances satisfaction to the end users. The theory generally increases the throughput, which is the rate at which organizations generates goal units. The performance of the entire system is usually limited by the weakest link or the constraint and hence all the improvement effort is aimed at this constraint so as to achieve a general improvement within the system and service delivery as a whole. The assumption in this theory is that the speed and volume at which products or services travel through the system are the primary determinants of the performance of the whole system and therefore removing the constraints will improve profitability and increase efficiency in service delivery. The positive effects of the theory may include protective inventories to enhance continuity, quality improvements throughout the systems, reduced variations and a positive impact on flow and therefore throughput.

The theory says that every system no matters how well it performs, has at least one constraint that limits its performance. The same is used in the identification of the constraint and restructuring your operations so as you overcome it. It further suggests that constrains in an organization or system can be minimized for more efficiency towards the achievement of goals by working through the identification of the constraint, the management of the same

and the final evaluation of the organizational performance. Goldratt (2004) further advises that if the outcome is not satisfactory, then the whole process goes back to the second step that involves the management of the constraint. If at all the outcome is as per required, then the whole process begins from step one that involves the identification of another constraint.

## **2.2 Empirical literature review.**

### **2.2.1 The extent of lean practices within Vihiga county government.**

In developing countries, the public administrations are under increasing pressure to improve their effectiveness for providing more and better services to the people (Ukpata and Olukotun, 2008) the introduction of new aspects such as E-government services and applications in service delivery has led to massive changes in the structure of the traditional government functions.

Holliday and Yep, (2005) investigating on the E-government public administration in China, pointed out that the use of e-government is meant to disseminate information, enhance the delivery of services to the citizens and facilitate citizen participation in the governance in a cost effective manner, as per their research findings, E-governance was not a technological term or event but rather a profound revolution. However, the researchers narrowed down on the context of lean practice to concentrate on E-government and thus failed to give the lean practices a holistic approach, therefore failing to indicate whether the other aspects would be successfully implemented in a local government set up like in Vihiga County to produce the same outcome.

Keraro and Isoe, (2015), carrying out a Research on Good governance and the enhancement of effective service delivery for accelerated economic development of counties in Kenya, pointed out that county governments that intend to achieve enhanced service delivery and social- economic development in Kenya are already practicing and have adopted a lean management structure for effective and efficient management of the county institutions. The outcome was based on a feedback from a questionnaire survey and They went ahead and concluded that those that want to achieve better utilization and maximum gain from their varied local opportunities and resources, it would be imperative for them to focus on determining important governance structural orientation that match their different strategies. However, the researchers studied the concept of lean management as opposed to the current

concept of lean practices, their intention was to determine growth on the socio-economic growth of county governments in Kenya though their research failed to deliberate on the effects their factors would have on the operational performance of the same county government, an action the current work intends to achieve.

Keitany and Riwo-Abudho (2014) studying effects of lean production on organizational performance in a flour producing company in Nakuru, Kenya found that improving management styles and involving all employees at all levels as well as the application of better inventory management techniques lead to a more efficient practice of lean production. More so, their study also found that material management and physical distribution were positively related and were therefore critical determinants of a successful lean production practice within the organization. Using a descriptive research design, their study concluded that firms should adopt the use of lean production system as a means of improve performance. A point to note though is that their research centered on the concept of lean production as opposed to the current work on lean practices, more so they failed to mention whether the involvement of individuals would be deemed a success when employed in a government set up like Vihiga county as their research was done in a flour producing company.

### **2.2.2 The state of operational performance of Vihiga county government0.**

Womack *et al.* (2005), studying the application of lean in healthcare in Cambridge reported positive growth on productivity, cost, quality, and timely delivered service after having implementing lean practices in the hospitals in the United States. Graban (2009) also pointed out that successful lean practices improve patients care by reducing errors, decreased cost, reduced waiting time, improved interdepartmental interaction and increase employee satisfaction within the organization. Both Womack et al (2005) and Graban (2009) work outcomes were consistent with the intentions of the application of lean. However they both limited their work to the health sector and failed to explain to us if at all the same results would be yielded in a different sector all the same like in this case the Vihiga county government. In addition, Womack et al (2005) did their research in the United States of America and we are not informed whether the outcome would be consistent if the same was done in Africa and specifically in Kenya.

DelliFraine et al. (2010) working on assessing the evidence of six sigma and lean in health care industry, in the USA, found that there was an impact of lean implementation on the clinical outcome, processes of care and financial performance of health care service organizations. Thus the health sector being part and parcel of government and public sector service delivery, an introduction of lean practices within the systems and employee commitment to the same is a sure guarantee in the improved operational performance of county government. The researcher's work is somewhat consistent with the current research in terms of concept and context, though they did their research in the USA, a very developed country, an economic powerhouse with obviously better technology and quality of service delivery in the health sector. The researchers failed to state if at all the outcome of their research work would be consistent especially if it is done in another continent, especially Kenya and specifically in this case Vihiga which is in a third world country where technology and general service delivery to citizens is still lagging behind.

Baranson (1987) researching on lean and performance improvement in manufacturing industries pointed out that internal management practices like the product packaging and design, the technology in use, the organizational planning as a whole and the business system used within the same organization were key for a continuous improvement in operational performance, and the same would easily be applied in any context where the practice of lean is applied. Though Baranson recommended the application of the lean in any context, i.e. manufacturing, processing and so on, he failed to further explain and state clearly if the outcome would be consistent in all the cases, more so the application in a government set up like the Vihiga county government basing his conclusion in his research, done on a manufacturing industry.

Rahman *et al* (2010) investigating on the impacts on lean strategy on operational performance, based their research on three lean constructs; JIT, waste minimization and flow management in SMEs and Les, their research findings were that all the three lean constructs were significantly related to operational performance and hence could guarantee a consistent growth in performance of manufacturing companies in Thailand. However, they noted that their level of significance depended on the size of the organization and the ownership, either locally owned, joint ventures or foreign ownership. Measuring operational performance based four main parameters, i.e. quick deliveries as compared to competition, unit cost of product,



overall productivity and customer satisfaction. The finding of the research pointed a steady growth in operational performance with the application of lean strategies in the manufacturing firms. Though the research pointed at a positive outcome with the application of lean strategy, the research was done in a manufacturing firm, the researcher failed to mention if at all the results would be consistent when applied in a government set up like Vihiga county government, More so the concept of the researchers work is lean strategy as opposed to the current work which deliberates on lean practices.

### **2.2.3 The relationship between lean practices on operational performance of the county government.**

Punnakitikashem (2014), studying the impact of lean practices on performance of hospitals in Thailand, identified the four bundles of lean practices in health care which included HRM, patient flow, total quality management and standardizes work. Using multiple regression analysis to examine the factors, Her key findings suggested that there was a significant relationship between human resource management, patient flow and social capital to the hospitals operational performance, social capital being a bundle of the organizations commitment to the practice of lean management. She concluded that the success of lean practices in an organization is purely measured on its operational performance. However, the researchers' study was limited to a specific period of time and her research work was also limited to hospitals in Thailand. There is no indication that the same outcome would not be experienced within an unlimited time period nor would the same outcome be yielded if at all the research would have been carried out in Kenya and specifically Vihiga County.

Kuo *et al* (2008), studying the relationship between lean production practices and the manufacturing performance of the organization, identified the key components of the lean production and performance to be the suppliers, the customers and the organization's internal management strategies. Using a questionnaire survey, their outcome pointed at synergistic effects of lean practices was positively associated with the better manufacturing performance of the organization. According to them, the practice of lean entailed the reorganization of the organization supplier bases, massive customer involvement and supportive internal processes that are in line towards achieving the objectives. Citing Sakakibara *et al* (1997) and Giffi *et al* (1990), they pointed out that in phase of practice, lean production are generally shown to be associated with high performance as also deliberated in a number of studies in world class manufacturing. However, the research is carried out in a different concept, lean

manufacturing as opposed to the concept being studied currently which is lean manufacturing. The authors fail to inform us if the same results would be yielded with the current concept. More so the researchers studied manufacturing performance other than operational performance and hence there is no indication and guarantee of consistency in the outcome of the results with the current work.

Marin-Garcia *et al* (2010) researching on the relationship between Lean manufacturing, high involvement work practice and their effect on the operational outcome of a factory had an outcome pointing at significant relationship between implementation of the practices and the organizations competitive advantage. Deriving their feedback from recording management perceptions and objective measurement from a different industry from the commonly studied (ceramic industry In Spain) they found that there was a direct relationship of lean manufacturing, high involvement work practice and the operational performance of the organization.

Malonza (2014), researching on lean manufacturing and operational performance of Mumias sugar company Limited in Kenya, found that the company had averagely implemented lean manufacturing practices in its internal processes, using a descriptive research design, the operational performance of the company was cited to be positive. That is, there was an improvement in efficiency and standardization of internal processes within the factory. With this, he found that the company gained through an improved housekeeping of the plant, improved efficiencies and a general standardization of processes. However, Malonza (2014) studying lean manufacturing, contrary to the current study of lean practices limited his research to the Mumias sugar company. He failed to inform us whether, using the same research design would guarantee consistent outcome within other sectors like in this case the Vihiga county government.

Ondiek and Kisombe, (2013) doing a research on adoption of lean manufacturing tools and techniques in the sugar industries in Kenya, found that the sugar companies in Kenya had not given attention to all the key areas of lean manufacturing from an holistic perspective and hence there was only a little impact of these practices on the factory time efficiency. Using a descriptive and inferential statistical method, the conclusion they drew from their research was that sugar firm in Kenya lacked the full understanding of lean manufacturing concepts

and had therefore not reaped the full benefits of implementation of lean practices in their organizations.

### **2.3 Summary of knowledge gap**

Contextually, most studies reviewed majorly concentrated in manufacturing industry, service industry and private sector while the present study will concentrate in the public sector and local government setup.

Conceptually most empirical studies concentrated in lean manufacturing, lean production while the current study will be conducted on lean practices. Moreover, the studies considered performance of hospital, work services and operational outcome while the present study is proposing operational performance.

Methodologically, most studies applied descriptive and correlation analysis while the present study will utilize descriptive, correlation and regression analysis.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

This chapter contains the research design, the study area, the targeted population, sample size, data and data collection, data analysis and presentation and ethical consideration that were used to determine the effect of lean practices on the operational performance of county government in Kenya.

#### **3.1 Research design.**

The study adopted both a descriptive and correlation designs. A descriptive study tries to unearth the answers to the questions who, what, when, which and at times how. (Cooper and Schindler, 2003). In this study, we sought to find out how adoption of lean practices can improve the operational performance of county governments in Kenya. The approach was successfully used by Sidi (2013), when she sought to determine the outcomes of the institutionalization of devolved governance strategy by county governments in Kenya. The approach is therefore justified for this study. Correlation design involves gauging the cause effect between various study variables.

#### **3.2 Study area.**

The study was undertaken in Vihiga County, which has a population estimate of 554622 and an area of 563km squared is in the traditional western province, Western side of Kenya, situated on the eastern side of Kakamega forest. Vihiga County is situated in 00°03'00"N 34° 43'30"E.

#### **3.3 Population of the study**

The population of this study comprised of 81 staff of the Vihiga county government who are directly involved with procurement and operations department.

#### **3.4 Sample and sampling procedure**

Due to small population census sampling was adopted to pick the **81** staff drawn from procurement and operations departments from which an initial pilot study was carried out.

### **3.5 Data Collection methods.**

Primary data was utilized in the study. Primary data was collected through the use of a questionnaire survey.

#### **3.5.1 Data types and sources**

Primary data was used in this study. The primary data was collected from 80 staff drawn from both the procurement and the operations department.

#### **3.5.2 Data collection procedures**

The researcher personally administered the questionnaires to the respondents. There after the responses was cleaned and coded for analysis.

#### **3.5.3 Data collection instruments**

Structured questionnaires were used to collect data.

#### **3.5.4 Reliability test**

Reliability is a measure of the degree to which the research instrument yields consistent results or data after repeated trials and it is influenced by random errors. A measure is reliable to the extent that repeated application of it under the same condition by different researchers' gives consistent results. In this study, the reliability of the instrument was ascertained through split half method.

#### **3.5.5 Validity tests**

Borg and Gall (1996) has defined validity as the degree to which a test measures what it purports to measure. Hence a questionnaire is valid if it obtains the information intended to be received from the respondents. Validity of the instrument was determined through a pilot study.

### **3.6 Data Analysis**

Data was analysed using both descriptive statistics like measures of central tendencies, dispersion and normality and inferential statistics like correlation and regression analysis

### **3.7 Data presentation**

The findings were presented in form of tables and graphs

### **3.8 Ethical Considerations**

The researcher observed all ethical requirements and any material to be used will be appreciated in form of referencing

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter presents, analyses interprets and discusses the outcome of the study.

#### 4.2 Response rate.

The study managed to obtain a total of 69 completed questionnaires representing a total response rate of 81%.according to Edward et al (2000), this was a very impressive rate of return from the study. Edward further states that a response rate of 60% to 80% is barely acceptable.

#### 4.3 The extent of implementation of lean practices in Vihiga county government.

The study sought to establish the extent of the implementation of lean practices in Vihiga county governments. Respondents were requested to state the extent of implementation and rate their feedback on a 5 point linker scale where 1 was accorded 'very low', 2 accorded 'low',3 'moderate',4 'high' and 5 'very high'.

##### 4.3.1 Extent of lean practices.

The study assessed the level of implementation of lean practices within Vihiga County and the outcome is presented in the table below.

**Table 4.1 Extent of lean practices in Vihiga county government.**

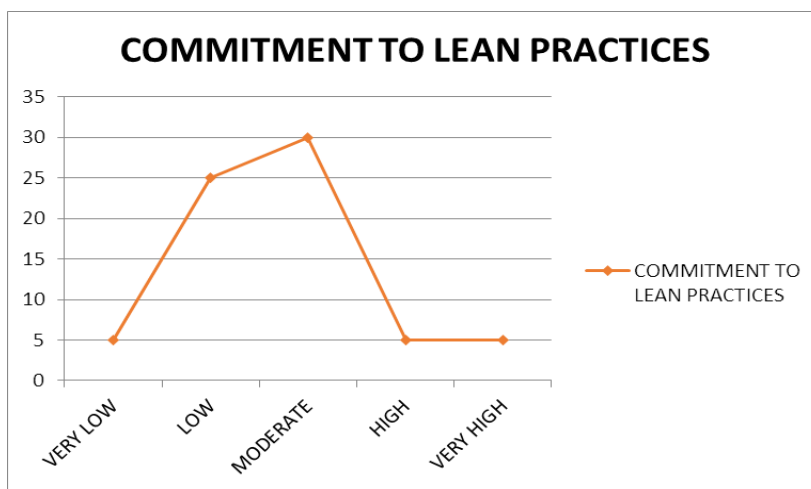
<b>Lean practices</b>	<b>Mean</b>
Level of commitment to the practice of Lean	2.69
Rate of elimination of wastages	2.53
Aspect of continuous improvement	3.04
Rate of correction and recalls in service	2.99
<b>Grand mean</b>	<b>2.81</b>

The study established that Vihiga county government implements a high level of lean practices, evidenced by a weighted mean of 2.69 .The correspondents acknowledged that the

county government was committed to the implementation of lean practices evident by a mean of 2.53 .The respondents also acknowledged that the county government was committed to the elimination of wastages and continuous improvements within its processes evident by the rating of a mean of 3.04.and mean of 2.99 when it comes to recalls and corrections of service provided.

The same information can be represented by the line graph below

**Figure 4.1.1 response on the extent of the practice of lean practices in Vihiga County.**



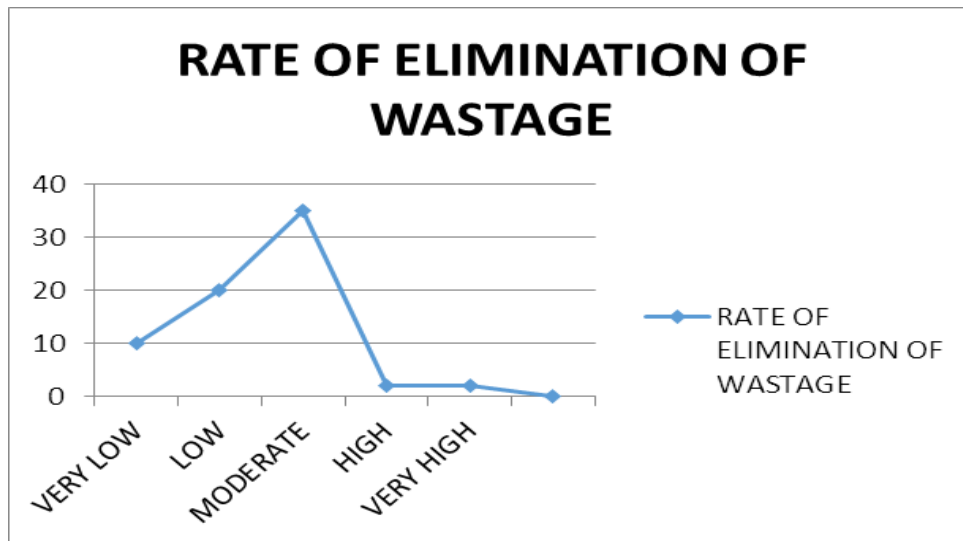
The same respondents are consistent with the findings of Ukpatha and Olukotun (2008) during their study of effect of organizational development on the Nigerian economy, which found that public administrations are under intense pressure to improve their effectiveness for providing more and better services to the people.

#### **4.3.1 Elimination of waste in the operation processes of Vihiga County.**

The study revealed that Vihiga County implemented lean in elimination of wastages like sealing of revenue leakages, combining overlapping tasks within the county government human resource and assigning more than one task to an individual. This is evidently illustrated by a mean of 2.53 from the respondents of the questionnaire. The same information is represented in a line graph as below.



**Figure 4.1.2 response on the rate of elimination of process in the Vihiga county operational processes.**



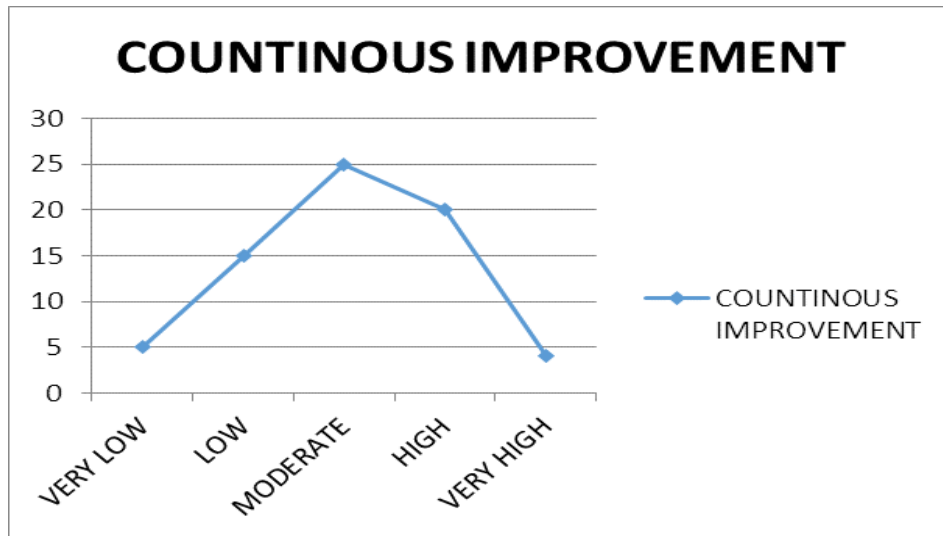
Graban (2009), pointed out that successful elimination of wastages within the operations in the healthcare sector improved patients care by reducing errors, decreasing operational costs, reduced time wastages, improved interdepartmental interactions and increased employee satisfaction as a whole. His findings are also consistent with the outcome of elimination of wastages from the correspondents above.

#### **4.3.2 Continuous improvement in Vihiga county operational processes**

The respondents acknowledged that there was a constant improvement in the operational performance and the services offered within the county government. This is evidently illustrated by a mean of 3.04 in the response from the questionnaires.

Ondiek et al (2013) studying the aspect of continuous improvement with the adoption of lean manufacturing tools in the sugar industry, found an outcome consistent with the correspondence of the research. They found that the sugar companies in Kenya had not given attention to the key areas of lean manufacturing from a holistic perspective to enhance continuous improvement and thus the above was very slow within their processes. Their conclusion was continuous improvements within organization process increases the customer satisfaction as per the correspondences above.

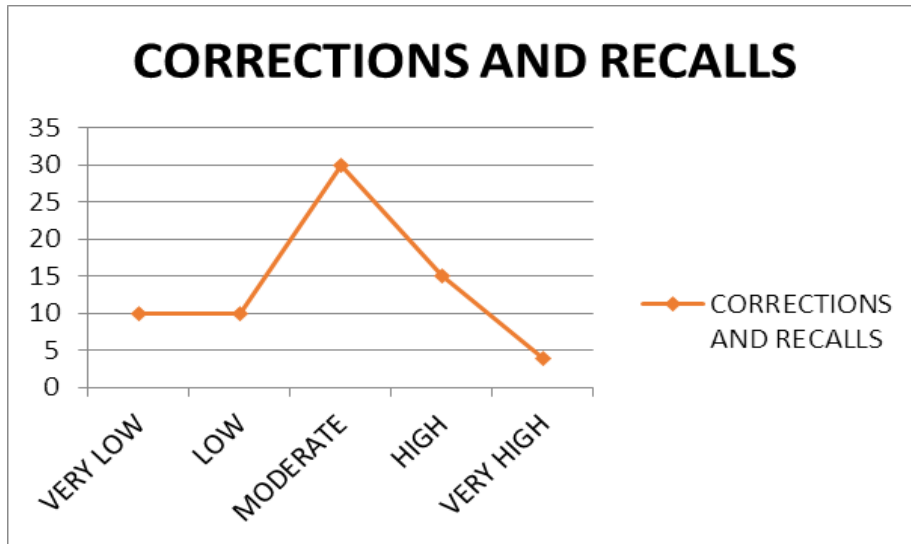
**Figure 4.1.3 graph showing the trend in continuous improvement within Vihiga County government.**



#### **4.3.3 Corrections and recalls in goods and services offered in Vihiga County.**

The research correspondents acknowledged that the rate corrections and recalls had drastically reduced largely in the services offered from a correspondent mean of 2.99 which can be easily labeled low from the linker scaling method. This is largely supported by the practice of lean practices within Vihiga county government and increased customer satisfaction in the services offered within the county government setup. The correspondents can also be further illustrated by the below graphical representation.

**Figure 4.1.4 graph showing the rate corrections and recalls within Vihiga county government operations**



**4.4 The state of operational performance in Vihiga county government.**

The study also sought to establish the performance of Vihiga county government within its operational activities. Respondents were also requested to avail their feedback using a five point linker scale.

**Table 4.2 State of operational performance in Vihiga County**

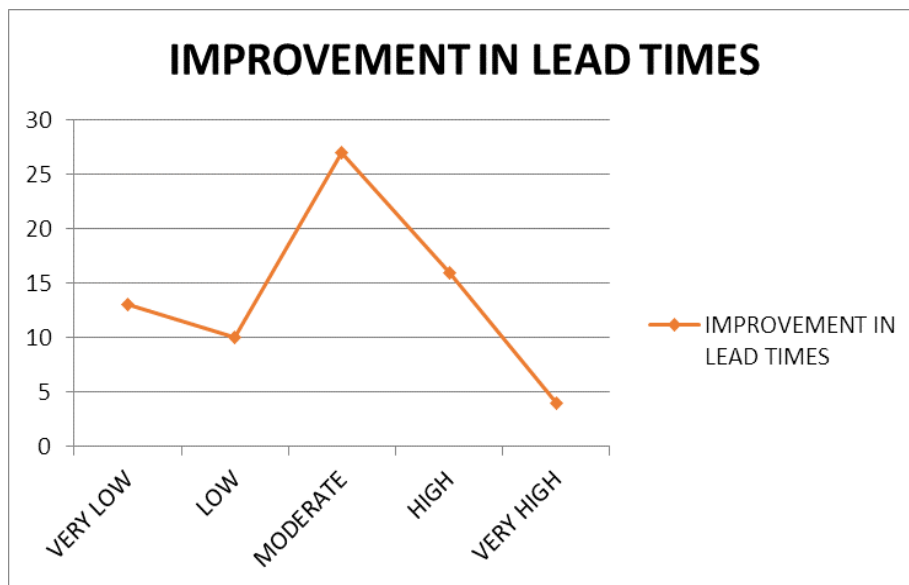
<b>Operational performance</b>	<b>Mean.</b>
Trend of improvement in lead time	2.81
Level of customer satisfaction	2.78
Level of integrity and accountability	2.10
<b>Grand mean</b>	<b>2.56</b>

#### 4.4.1 The rate of improvement in lead times is service delivery in the county government.

The study established that there was an improvement in lead times in the service delivery within the county's public service and this is evident by the correspondence of a weighted mean of 2.81.

The same information can be represented using the line graph as per the below diagram.

**Figure 4.1.5: graph showing the extent of improvement in lead-times in service delivery within Vihiga county government.**



Furthermore, this outcome is consistent with the findings of Miao, *et al* (2011) researching on lean public management in China, where their findings were that public administrations in developing countries are under intense pressure to improve on effectiveness and efficiency in providing more and better services to the people and public as a whole.

#### 4.4.2 The level of customer satisfaction within Vihiga county government.

The study established that the level of customer satisfaction had slightly increased but still moderate from the services offered within the county government. This is supported by a mean of 2.78 from the correspondents obtained by the research.

The same information can be illustrated by a line graph as per the diagram below.

**Figure 4.1.6: graph showing the level of customer satisfaction in Vihiga county government.**



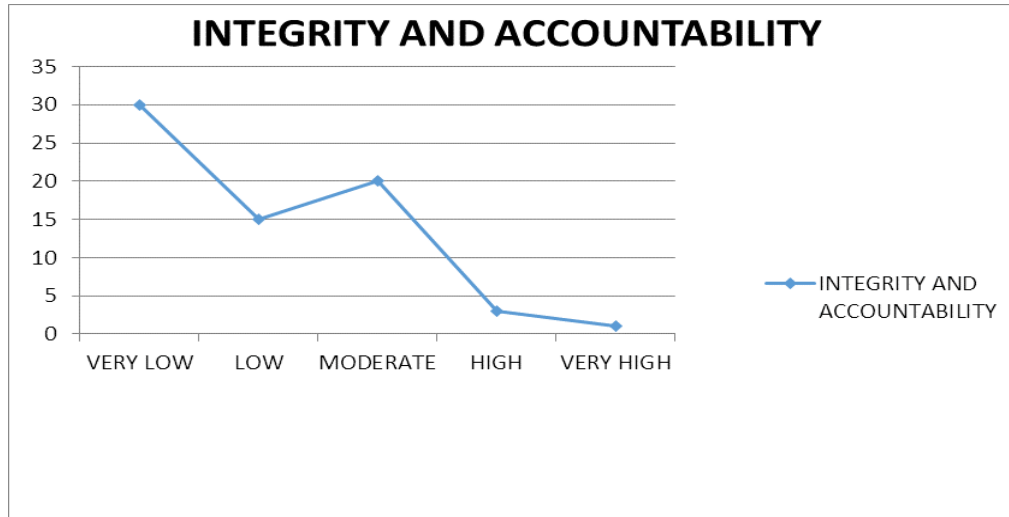
As Voss *et al* (1997) earlier elaborated, operational performance in an organization encompasses the measurable aspects of the organization’s internal processes. Mostly, it entails the defect rates and production reliability of the goods and services being offered, which majorly determines the level of customer satisfaction in the services being rendered within Vihiga county government.

#### **4.4.3 The level of integrity and accountability within Vihiga County government.**

The study established that the correspondents had very low confidence in the county systems when it came to issues integrity and accountability majorly when it came to public fund and revenue expenditure and appointments in the public sector within the county government. This is evident from a feedback of a weighted mean of 2.10, being the feedback found from the correspondents.

The same information can be represented by the line graph below.

**Figure 4.1.7: graph showing the level of integrity and accountability in Vihiga county government.**



**4.5** The study also sought to determine the correlation between the applications of lean practices against the operational performance of Vihiga county Government. respondents were also requested to deliver feedback on a 5 point linker scale.

**Table 4.3 Correlation between the application of lean practice and the performance**

		Lean practice	Operational performance
Lean practice	Pearson Correlation	1	.237*
	Sig. (2-tailed)		.033
	N	81	81
Operational performance	Pearson Correlation	.237*	1
	Sig. (2-tailed)	.033	
	N	81	81

\*. Correlation is significant at the 0.05 level (2-tailed).

Objective three sought to determine the relationship between lean practices and operational performance in Vihiga county government. From the above table 4.3, it is clear that lean practice had a significant weak positive relationship with operational performance ( $r= 0.237$ ,  $p= 0.033$ ). This implies that whenever the county government put in place a lean practice, there effect on the operational performance is equivalent to 3.3%. This finding support those

of Punnakitikashem (2014), who studied the impact of lean practices on performance of hospitals in Thailand, and her key findings suggested that there was a significant relationship between human resource management, patient flow and social capital to the hospitals operational performance, social capital being a bundle of the organizations commitment to the practice of lean management.

The findings further agrees with those of Kuo *et al* (2008), who studied the relationship between lean production practices and the manufacturing performance of the organization and whose outcome pointed at synergistic effects of lean practices was positively associated with the better manufacturing performance of the organization.

The findings further support those of Marin-Garcia *et al* (2010) who researched on the relationship between Lean manufacturing, high involvement work practice and their effect on the operational outcome of a factory and whose outcome pointed at significant relationship between implementation of the practices and the organizations competitive advantage.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Summary of findings.**

On establishing the relationship between the implementation of lean practices and its effect on the operational performance of Vihiga county government, the study established that the practice of lean had a direct effect on the performance of the county government. The highest significant relationship was between lean practices and the aspect of continuous improvements in the service delivery at the county government. The lowest significant relationship was between the implementation of lean practices and the level of integrity and accountability in the service delivery within the county government.

The study also established that, with the aspect of continuous improvement as an element of lean practice, the correspondence showed a positive array of hope that the county government was on the right track and there was still a massive room for improvement. Further, the study established that the state of operational performance of Vihiga county government was on an upward trend, from the correspondence, alongside the continuous improvement there was minimal corrections and recalls in the services provided and massive elimination of wastages through laying off of excess staff, combining roles to be performed and the audit of the county payroll to eradicate the ghost workers.

#### **5.2 Conclusion.**

The study concludes that the implementation of lean practices has a direct impact on the operational performance of the County government. It establishes that elimination of wastages most importantly has a direct positive impact on the county government efficiency and effectiveness within its operations and service delivery.

On a negative aspect, the study also conclude that the rate of integrity and accountability in the county government expenditure and appointments was still wanting and needed a massive improvement so as to increase the performance even more. The study also established that despite the county government goodwill in implementation of lean practices, the county government was still facing massive challenges in the actual implementation of the same.



### **5.3 Recommendations.**

The study recommends that;

- a) To improve the rate of eradication of wastages within the county processes, on appointments, the human resource department should try to match the resource ability and the task at hand so as to increase efficiency and effectiveness in service delivery.
- b) The study also recommends that some of the roles within the county government should be merged and combined so as to tame the wage bill and maximize on the available resource and at the same time remain competitive in service delivery.
- c) The study also recommends the inclusion of service of an external audit firm at least after every financial year to tame the rising integrity issues within the county operations and to enhance the aspect of accountability in decisions made and services offered.

### **5.4 Suggestions for further studies.**

Future studies may seek to investigate;

- a) The effect of implementation of lean practices on the performance in other sectors like manufacturing industries, the processing industries and the impact on their general performance and compare the same to the results of the above study.
- b) Effect of sustainability agenda in the general performance of both county and national government from the triple bottom line angle of the economic performance, social inclusion and environmental regulatory adherence in their operations.
- c) Further studies can also be undertaken to see the manner in which different way of elimination of wastages can be implemented to near perfect condition so as to improve efficiency and effectiveness in other sectors.
- d) Further studies can also be carried out to ascertain how best the available human resources can be matched with their ability to meet the tasks at hand so as to increase efficiency and effectiveness and also encourage professionalism as a whole within the county government setup.

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**APPENDIX**  
**QUESTIONNAIRE**

Scale of 0-5 (0 = No implementation, 1= very low implementation, 2= low implementation, 3= moderate implementation, 4= high implementation, 5= very high implementation).

**A Extend of lean practices in Vihiga county government**

- i. In your opinion, rate the extent of practice of lean in Vihiga County during the following period.

January to March 2014:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
April to June 2014:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
July to October 2014:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
November to December 2014:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
January to March 2015:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
April to June 2015:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
July to October 2015:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )
November to December 2015:	1 ( )	2 ( )	3 ( )	4 ( )	5 ( )

- ii. Rate Vihiga county government's commitment in the practice of lean.

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain

- iii. How would you rate level of elimination of wastages with the application of lean practices in the Vihiga county government?

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain

- iv. How would you rate the aspect of continuous improvement within the county operations?

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain

- v. How would rate the rate of corrections and recalls within the county activities?

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain

**B. The state of Operational performance in Vihiga county government.**

- i. In your own opinion, rate the state of operational performance over the Following period.

January to March 2014: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

April to June 2014: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

July to October 2014: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

November to December 2014: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

January to March 2015: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

April to June 2015: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

July to October 2015: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

November to December 2015: 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

- ii. In your own opinion, rate the trend of improvement in lead times of service delivery in the operational performance of the county government.

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain

iii. In your own opinion, rate the level of customer satisfaction with the operational performance of the county government.

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain

iii. In your own opinion rate the level of integrity and accountability within the county government.

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain

**C. Effects of the lean practices on the operational performance of Vihiga County.**

i. In your opinion, rate the extent in which the practice of lean has improved customer service in Vihiga County.

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain.

ii. In your opinion, rate the level of staff productivity with the application of lean in Vihiga county government.

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain.

iii. In your opinion, rate the level of improvement in revenue collection and elimination of role duplications in Vihiga county government.

1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

Explain.