

LB/TH/39/2025  
TH5987

**FACTORS AFFECTING EFFICIENCY OF PUBLIC  
PROCUREMENT FUNCTIONING UNDER DIRECTORATE  
OF ORDNANCE SERVICES OF SRI LANKA ARMY**

**W.B.G SOYSA**

**218469U**

**DISSERTATION / RESEARCH PAPER SUBMITTED IN PARTIAL  
FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER  
OF BUSINESS ADMINISTRATION IN SUPPLY CHAIN MANAGEMENT AT  
UNIVERSITY OF MORATUWA, SRI LANKA**

**MASTER OF BUSINESS ADMINISTRATION IN SUPPLY  
CHAIN MANAGEMENT**

**DEPARTMENT OF TRANSPORT & LOGISTICS  
MANAGEMENT**

**FACULTY OF ENGINEERING**

**UNIVERSITY OF MORATUWA**

**SRI LANKA**

## Declaration

I do hereby declare that no portion of the work referred to in the dissertation has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning. Further, all the work in this dissertation is entirely my own, unless referenced in the text as a specific source and included in the bibliography.

21.08.2024

-----

Signature of the Student

Registration No: 218469U

-----

Date

## Recommendation of the supervisor

As I have been educated by the candidate this study has not been conducted by any of the researcher previously and this was thoroughly conducted under my supervision. Therefore it could be accepted in partial fulfilment of the requirements of Master of Business Administration in Supply Chain Management Degree.

8/21/2024

-----

-----

Signature of the Supervisor

Date

Name of the Supervisor: Prof. Amila Thibbotuwawa PhD (AAU Denmark); MSc (EMN, France); BSc TLM (Hons) (UOM, Sri Lanka)

Position: Professor

Address: Department of Transport & Logistics Management, Faculty of Engineering, University of Moratuwa, Sri Lanka

## **ACKNOWLEDGMENTS**

I would like to extend my deep gratitude and respect to all the lecturers who lectured me on a wide area of topics during the MBA program. The knowledge provided by these lecturers not only improved my academic knowledge but also went a long way in terms of improving my personality to be in line with a master's graduate.

Specially, I would convey my utmost respect and gratitude to Coordinator of the MBA program, Dissertation supervisor and the MBA lecture panel in Department of Transport & Logistics Management, Faculty of Engineering, University of Moratuwa, Sri Lanka who guided me throughout the lecture series of Research Methodology to conduct an individual research study.

Finally, I would also like to express my deep gratitude and thanks to my wife, daughter and parents for having the forbearance and the understanding in helping me throughout the successful MBA journey.

## ABSTRACT

This study explores the factors affecting the efficiency of public procurement within the Directorate of Ordnance Services of the Sri Lanka Army, utilizing key theoretical frameworks to provide a comprehensive analysis. The Institutional Theory, which identifies three pillars of regulatory, normative, and cultural cognitive and this theory highlights the importance of rules, norms, and shared understandings in shaping institutional behavior. Public Value Theory emphasizes the need for public service management to align values with strategic goals, secure political legitimacy, and ensure operational capacity. Additionally, Transaction Costs Theory underscores the significance of minimizing barriers and costs associated with information acquisition and contractual obligations in public procurement. Understanding these theories is crucial for examining how public procurement can achieve value for money and contribute to the delivery of public value. However, there is a dearth of studies about efficiency of public procurement in Sri Lanka Army with special attention to some key determinant factors on efficiency in procurement process. Therefore, this study attempts to fill this gap by identifying factors affecting efficiency of public procurement functioning under directorate of ordnance services of Sri Lanka Army.

The aim of the study is to identify factors affecting the efficiency of public procurement system functioning under Directorate of Ordnance Services of Sri Lanka Army and introduce possible approaches to overcome the barriers and loopholes in the process. To achieve this aim, the study attempts to test four main factors as independent variables namely Professional Qualification of Procurement Employees, Information Communication Technology, Contract Management, Procurement Planning Process. The study review and test these factors through a structured questionnaire based on five-point Likert Scale distributed to individual Army officers who directly involve with the procurement process of Directorate of Ordnance Services of the Sri Lanka Army. Data were collected using purposive sampling of 108 individual officers and the collected data were analyzed using SPSS statistical software which may include descriptive statistics of frequency tables, percentages, means, standard deviation and factor analysis. Descriptive statistics are used to describe the influence level of key determinant factors on the efficiency of procurement process and factor analysis which helps to analyze the structure of correlations among variables and test the hypothesis in the study. The findings show that a positive significant influence of Professional Qualification of Procurement Employees, Information Communication Technology, Contract Management,

Procurement Planning Process on efficiency of procurement process. The results also illustrate that procurement planning process indicate a highest strong positive significant impact on efficiency of public procurement process. Findings of this study will be useful for Directorate of Ordnance Services, Sri Lanka Army, Sri Lanka Navy, Sri Lanka Air Force, other similar government organizations, government training institutions and corporate executives to make sound decisions related to procurement matters.

**Keywords:** *Efficiency of Public Procurement, Institutional Theory, Public Value Theory, Transaction Cost Theory, Value for Money.*

## TABLE OF CONTENTS

Declaration .....	i
Recommendation of the Supervisor.....	ii
Acknowledgements.....	iii
Abstract.....	iv
Table of Content .....	v
List of Tables .....	ix
List of Figures .....	x
Appendices .....	xi

### **CHAPTER I**

1.	Introduction.....	13
1.1	Background of Public Procurement .....	13
1.2	Justification on Research Problem .....	19
1.3	Problem Statement .....	21
1.4	Research Questions .....	23
1.5	Research Objectives .....	23
1.6	Significance of the Study .....	24
1.7	Limitations of the Study .....	24
1.8	Chapter Outline .....	25
1.9	Chapter Summary .....	25

### **CHAPTER II**

2	Literature Review .....	27
2.1	Introduction.....	27
2.2	Theories of Procurement .....	27
2.2.1	Institutional Theory .....	27
2.2.2	Public Value Theory .....	28
2.2.3	Transaction Costs Theory .....	28
2.2.4	Efficiency of Public Procurement .....	29

2.2.5	Factors Affecting to the Efficiency of Public Procurement .....	30
2.2.6	Selected Factors for Studies .....	31
2.2.6.1	Professional Qualification of Procurement Staff .....	31
2.2.6.2	Information Communication Technology on Procurement Activities.....	32
2.2.6.3	Contract Management in Procurement Process .....	33
2.2.6.4	Procurement Planning in Procurement Process .....	34
2.3	Empirical Studies .....	34
2.4	Identify the Specific Gap .....	37
2.3	Theoretical and Practical Contribution .....	38
2.4	Conclusion .....	39

### **CHAPTER III**

3.	Research Design and Methodology .....	40
3.1	Introduction .....	40
3.2	Conceptual Framework .....	40
3.3	Hypothesis .....	41
3.4	Research Design .....	43
3.5	Primary Data Collection .....	44
3.6	Sampling Procedure .....	45
3.7	Preparation of the Data Base .....	46
3.7.1	Data Entering .....	46
3.7.2	Data Editing .....	46
3.7.3	Coding .....	46
3.7.4	Data Accuracy .....	46
3.7.5	Missing Data .....	46
3.8	Data Analysis Technique .....	47

## CHAPTER IV

4.	Data Presentation and Analyses.....	49
4.1	Introduction .....	49
4.2	Preparation of the Data Base .....	49
4.2.1	Data Collection and Response Rate .....	49
4.3	Demographic Characteristics and Analysis of Sample Profile .....	50
4.3.1	Gender of the Respondents .....	50
4.3.2	Age of the Respondents .....	51
4.3.3	Highest Education Qualification of the Respondents ..	51
4.3.4	Working Experience of the Respondent .....	52
4.4	Reliability Test .....	53
4.5	Test of Validity .....	53
4.5.1	Factor Analysis of Variables Influencing the Efficiency of Public Procurement Functioning Under Directorate of Ordnance Services of Sri Lanka Army .....	54
4.5.2	Test of Linearity.....	57
4.5.3	Test of Values of the Residuals are Normally Distributed .....	59
4.5.4	Multi-collinearity .....	61
4.5.5	Cook's Distance .....	62
4.6	Test of Hypothesis .....	62
4.6.1	Multiple Regression Analysis for Hypotheses Testing .....	62
4.6.1.1	Model Summary .....	63
4.6.1.2	ANOVA for all Variables .....	64
4.6.1.3	Coefficient .....	65
4.6.1.4	Testing Hypothesis 1 (H1).....	66
4.6.1.5	Testing Hypothesis 2 (H2).....	66

	4.6.1.6 Testing Hypothesis 3 (H3).....	66
	4.6.1.7 Testing Hypothesis 4 (H4).....	66
4.7	Summary of Hypothesis Testing.....	67
4.8	Relates the Findings to Theories.....	68
	4.8.1. Linking Findings to Institutional Theory.....	68
	4.8.2. Relates Findings to Public Value Theory .....	68
	4.8.3. Connecting Findings to Transaction Cost Theory .....	69
4.9	Chapter Summary .....	69

## **CHAPTER V**

5.	Conclusion & Recommendation .....	70
5.1	Summary of the Study .....	71
5.2	Summary of Findings.....	72
	5.2.1 Professional Qualification and Efficiency of Procurement Process.....	72
	5.2.2 Information Communication Technology and Efficiency of Procurement Process .....	73
	5.2.3 Contract Management and Efficiency of Procurement Process.....	73
	5.2.4 Procurement Planning Process and Efficiency of Procurement Process.....	73
5.3	Conclusion .....	73
5.4	Recommendations.....	74
5.5	Future Research Directions .....	75

## List of Tables

	<b>Page No</b>
Table 1.1 - National Budget Allocation Details of Sri Lanka Army for the Year 2023.....	14
Table 1.2 - Utilization Performance of the National Budget Allocation of Sri Lanka Army for the Year 2020.....	16
Table 1.3 - Utilization Performance of the National Budget Allocation of Sri Lanka Army for the Year 2021.....	16
Table 1.4 - Utilization Performance of the National Budget Allocation of Sri Lanka Army for the Year 2022.....	16
Table 4.1 - Survey Response .....	49
Table 4.2 - Frequencies of the demographic variables .....	50
Table 4.3 - Reliability Statistics of the Measures .....	53
Table 4.4 - Factor Analysis for Behavioral Variables .....	54
Table 4.5 - Correlations Statistics.....	61
Table 4.6 - Residuals Statistics .....	62
Table 4.7 - Model Summary .....	63
Table 4.8 - ANOVA Table .....	64
Table 4.9 - Coefficients .....	65

## List of Figures

	<b>Page No</b>
Figure 1.1 - Outline Organization of Sri Lanka Army .....	15
Figure 1.2 - Efficiency Measuring Framework .....	20
Figure 3.1 - Conceptual Framework of the Study .....	41
Figure 3.2 - Research Approach .....	43
Figure 4.1 - Gender of Respondents .....	51
Figure 4.2 - Age of the Respondents .....	51
Figure 4.3 - Highest Education Qualification of the Respondents .....	52
Figure 4.4 - Working Experience of the Respondents .....	52
Figure 4.5 - Scatterplot Diagram of Professional Qualification Factor .....	57
Figure 4.6 - Scatterplot Diagram of Information Communication Technology Factor.....	58
Figure 4.7 - Scatterplot Diagram of Contract Management Factor ....	58
Figure 4.8 - Scatterplot Diagram of Procurement Planning Process Factor .....	58
Figure 4.9 - Normal P-P Plot of Regression Standardized Residual - all Independent Variables.....	59
Figure 4.10 - Normal P-P Plot of Regression Standardized Residual Professional Qualification.....	59
Figure 4.11 - Normal P-P Plot of Regression Standardized Residual Information Communication Technology .....	60
Figure 4.12 - Normal P-P Plot of Regression Standardized Residual Contract Management.....	60
Figure 4.13 - Normal P-P Plot of Regression Standardized Residual Procurement Planning Process .....	61

## List of Appendices

Appendix 1 - Questionnaire of the Research
--

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of Public Procurement

According to the Procurement Manual (Procurement Manual (Goods and Works) of Sri Lanka, 2006, p 1) Public procurement is the process by which the Procurement Entities, purchase the inputs for vital public-sector investments. Those investments, both in physical infrastructure and in strengthened institutional and human capacities, lay foundations for national development. In procurement terms, those inputs are generally grouped into three categories of Works, Goods and Services. The quality, timeliness, appropriateness and affordability of those procured inputs can largely determine whether the public investments will succeed or fail.

According to the Akumuntu J. (2009) procurement encompasses the whole process of acquiring property and/or services. It begins when an agency has identified a need and decided on its procurement requirement. Procurement continues through the processes of risk assessment, seeking and evaluating alternative solutions, contract award, delivery of and payment for the property and/or services and, where relevant, the ongoing management of a contract and consideration of options related to the contract. Further a well-functioning procurement system based on transparency, competition, economy, efficiency and accountability is critical for good economic management and addressing leakages of government funds, improving the effectiveness of public expenditure in poverty reduction and enhancing the public's confidence in government intentions and programs.

According to the Annual Report (Sri Lanka, Ministry of Finance, 2017, p 212) "Being the single largest buyer in the market, around 25 % of its total spending is disbursed through public procurement annually for public service delivery". Therefore, public procurement policies are played significant and greater role in the economy. Moreover, public procurement has a significant influence on the political, economic, social, and legal environment of the country. Therefore, Sri Lankan government takes necessary arrangements to ensure the operational fitness of the public procurement process and identified the importance of the process to wellbeing and growth of the nation. The National Procurement Commission established under the 19th Amendment to the Constitution is the principle authority to formulate fair, equitable, transparent, competitive and cost effective procedures and guidelines for the procurement of Goods and Services, Works, Consultancy Services and Information Systems by government institutions. As such, in the absence of a new set of

procedures and guidelines issued by the National Procurement Commission, the following Guidelines are still being used along with the amendments made from time to time through circulars and supplements issued by the Department of Public Finance.

a. Procurement Guidelines and Manual - 2006 (Goods and Works)

Ali and Audi (2021), emphasized to bring efficiency in the public procurement process, certain guiding principles must be observed like the value of money, economy, transparency, quality of goods & services, and fair competition, without which efficient procurement process will remain questionable. Further elaborated that, public procurement must be efficient if it has to ensure economy and transparency. In this regard, annual procurement planning, use of information and communication technologies, capacity building of employees, and a strong redressed system may assist public procurement efficiency leading to economy and transparency in the procurement process.

Sri Lanka Army as the leading government institution in Sri Lanka, need to be adhered with the government laid down procurement guidelines and it is related publications when performing the procurement tasks. As per the Budget Estimates of Sri Lanka for the year 2023, the considerable portion of the government annual budget of Sri Lanka is for the Sri Lanka Army and in year 2023 this is taking as 4% from the total national budget and the details are as follows;

Table 1.1: *National Budget Allocation Details of Sri Lanka Army for the Year 2023*

Type of Estimate Allocation	Budget Allocation (Rs. Mn)		Sri Lanka Army Budget Allocation as a % of Total National Budget
	Total National Budget Details	Total Sri Lanka Army Budget Details	
(a)	(b)	(c)	(e)
Estimate for Recurrent Expenditure	4,634,263	204,939	4.42%
Estimate for Capital Expenditure	1,219,796	4,777	0.39%
<b>Total Budget Estimate</b>	<b>5,854,059</b>	<b>209,716</b>	<b>4%</b>

(Source: Budget Estimates of Sri Lanka for the Fiscal Year 2023)

From this total annual budget allocation, except the allocation for salaries and emoluments the considerable portion of allocation is spend through the procurement



Table 1.2: *Utilization Performance of the National Budget Allocation of Sri Lanka Army for the Year 2020*

Type of Allocation	Allocation		Actual Expenditure	Allocation Utilization as a % of Final Allocation
	Original (Rs.)	Final (Rs.)		
(a)	(b)	(c)	(d)	(e)
Recurrent	161,976,325,000.00	161,976,325,000.00	160,751,464,394.58	99%
Capital	3,628,554,000.00	3,628,554,000.00	3,092,009,518.53	85%

(Source: Sri Lanka Army Annual Performance Report 2020)

Table 1.3: *Utilization Performance of the National Budget Allocation of Sri Lanka Army for the Year 2021*

Type of Allocation	Allocation		Actual Expenditure	Allocation Utilization as a % of Final Allocation
	Original (Rs.)	Final (Rs.)		
(a)	(b)	(c)	(d)	(e)
Recurrent	163,307,970,000	173,428,290,000	172,981,802,481	99.74%
Capital	6,465,000,000	10,008,882,000	6,004,748,698	59.99%

(Source: Sri Lanka Army Annual Performance Report 2021)

Table 1.4: *Utilization Performance of the National Budget Allocation of Sri Lanka Army for the Year 2022*

Type of Allocation	Allocation		Actual Expenditure	Allocation Utilization as a % of Final Allocation
	Original (Rs.)	Final (Rs.)		
(a)	(b)	(c)	(d)	(e)
Recurrent	180,740,190,000	200,913,252,000	189,455,194,012	94.30%

Capital	5,509,280,000	4,874,000,000	4,171,816,208	85.59%
---------	---------------	---------------	---------------	--------

(Source: Sri Lanka Army Annual Performance Report 2022)

By analyzing the Annual Allocation utilization details in the financial year 2020, 2021 and 2022 mentioned above, the considerable portion of the allocations are remaining as unutilized at the end of each year. Utilizing the entire allocation received for the respective financial year is paramount important for achieving the desired goals and objectives of the Sri Lanka Army. Hence need to identify the factors which are affecting to utilization of the allocation through the procurement process.

Based on the organizational hierarchy of the Sri Lanka Army, the Directorate of Ordnance Services is the main procurement organization and mainly the uniforms, explosives, stationeries, spares for vehicles, spares for communication items, spares for computer equipment and other general items are procured through this organization. From the total budget of Sri Lanka Army for year 2023, Rs. 152,283,200,000 is for the salaries and emoluments. Accordingly, the balance amount of Rs. 57,432,800,000 is for the acquirer of other goods and services through the procurement process and from this total also, Rs. 13,107,336,914 is allocated under Directorate of Ordnance Services to carry out their procurement activates and this is 22.82% from the total budget of the Sri Lanka Army except the allocation for salaries and emoluments.

Science in the process of identifying the key determinant factors on efficient procurement process of Sri Lanka Army, the Directorate of Ordnance Services also having the major implication and the corrective actions based on the findings of studies of the procurement process of the Directorate of Ordnance Services will impact to correct the entire procurement process of the Sri Lanka Army. Therefore, the Directorate of Ordnance Services is selecting as my studying organization.

While the Procurement Guideline (Goods and Works) (2006) - Democratic Socialist Republic of Sri Lanka, Procurement Manual (Goods and Works) (2006) - Democratic Socialist Republic of Sri Lanka provide direction for procurement activities of Sri Lanka Army. When concern with the efficiency of public procurement of Directorate of Ordnance Services, it may affect some various factors. However, there have been no studies specially examining the factors influencing on procurement efficiency of Directorate of Ordnance Services of Sri Lanka Army. Due to dearth of studies carried out based on efficiency of the public procurement functioning under Sri Lanka Army,

current study attempts to fill this gap by identifying the factors affecting the efficiency of public procurement system functioning under Directorate of Ordnance Services of Sri Lanka Army and introduce possible approaches to overcome the barriers and loopholes in the process.

According to the paper written by Okinyi and Muturi (2016), Institutional Theory: Institutional Theory helps identify three pillars of institutions as regulatory, normative, and cultural cognitive. The regulatory pillar emphasizes the use of rules, laws, and sanctions as enforcement mechanism, with expedience as basis for compliance. The normative pillar refers to norms and values with social obligation as the basis of compliance. The cultural-cognitive pillar rests on shared understanding on common. Lahdenpera P. (2013), this theory explains government purchasing decisions should not only focus on obtaining goods and services at the lowest cost but also on generating broader societal benefits and a focus on ensuring that the appropriate operational tools and resources are in place to ensure delivery of public value and the measurement of the value created. As per the Amayi and Ngugi (2013), institutions are composed of cultural-cognitive and regulative elements that, together with associated activities and resources give meaning to life. The three pillars of institutions include regulatory, normative and cultural with by all multidimensional analysis cognitive. The regulatory pillar emphasizes use of rules, laws and sanctions as enforcement mechanism, with expedience as a basis for compliance. The normative pillar refers to norms and values, social obligation being the basis of compliance. The cultural-cognitive pillar rests on shared understanding.

Public Value Theory: Public Value Theory can be summarized as an approach used by management of public services based around the three strategies with its combination of the agreement of values and overall strategy, second one being securing of political legitimacy through the authorizing environment, and finally the availability of the appropriate operational capacity.

Transaction Costs Theory: According to the Njiraini and Moyi (2006), Transaction costs theory can be useful in unraveling sources of barriers to medium size enterprises participation in public procurement. Transaction costs include the cost of obtaining and verifying information about the quantity and quality of goods and services, the partner's transactions and the quality of property rights to be transferred, including legal and contractual framework.

Therefore, the procurement decisions of Directorate of Ordnance Services of Sri Lanka Army are always critical in the view of delivery public value and measurement of value created. Therefore, to examine the factors affecting efficiency of public procurement functioning under Directorate of Ordnance Services of Sri Lanka Army is important area to study. The understanding of how factors are affecting on the efficiency of public procurement is key in explaining the way of achieving value for money.

This research was conducted as a quantitative research and it is followed by the positivism research paradigm based on deductive research approach. The positivism research paradigm based on a single reality and properties should be measured through objective methods. Therefore, this research uses quantitative approach as research strategy. The research process aims to arrive at a reasoned conclusion by logically generalizing of known facts about individual officers who engage with procurement activities of Directorate of Ordnance Services of Sri Lanka Army.

The study used primary data which were collected using questionnaires from a purposively selected sample. Accordingly, unit of analysis is individual officers who engage with procurement activities of Directorate of Ordnance Services of Sri Lanka Army. The data will collect only one time from the individual officers by using purposive sampling technique. The primary data will be collected through structured questionnaire from the selected individual officers who engage with procurement activities of Directorate of Ordnance Services of Sri Lanka Army. It is used 5-point Likert Scales to rank the answers of questions. The study targets a sample of 98 respondents and it is determined by using Purposive Sampling Procedures for the military officers who engage with the procurement activates in the Army related to the procurement functions of Directorate of Ordnance Services of Sri Lanka Army. The quantitative data collected through the questionnaire will be coded and entered into Statistical Packages for Social Scientists (SPSS) and analyzed using descriptive statistics. This may include descriptive statistics of frequency tables, percentages, means standard deviation & regression analysis to identify the key determinant factors influencing in efficiency of procurement process.

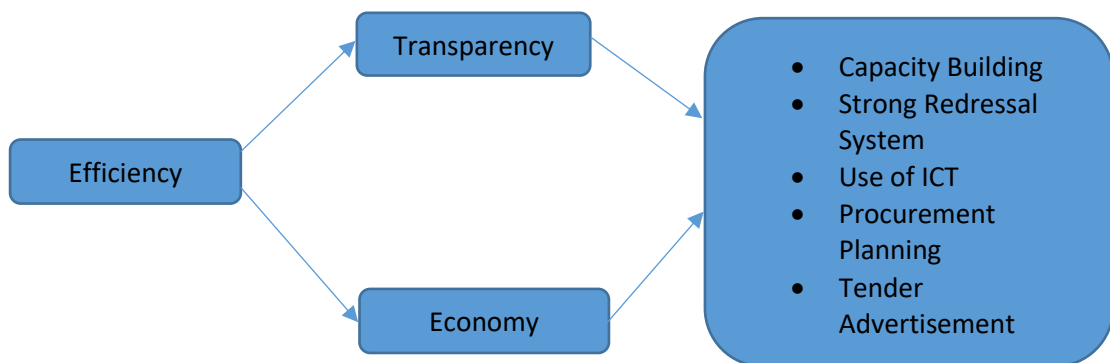
## **1.2 Justification on Research Problem**

The Sri Lanka Army Headquarters has implemented several Procurement Committees and established numerous procurement institutions to streamline and expedite the procurement process, aiming for increased efficiency. This approach involves

approved estimates, prompt decision-making, financial allocations, and clear guidelines for easy adoption. Despite policymakers' intentions, it is observed that decentralizing decision-making in procurement activities has not resulted in the desired efficiency of the procurements coming under the votes of Directorate of Ordnance Services of Sri Lanka Army. Basically this can be seen by perusing the details pertaining to the non-utilized vote allocations at the yearend mentioned under table 1.2, 1.3 and 1.4. The considerable percentage of the non-utilized allocations are remaining at the end of each year. Hence, there is a need to investigate the factors affecting efficiency of public procurement functioning under Directorate of Ordnance Services of in the Sri Lanka Army.

Ali and Audi (2021) stated that, the efficiency is measured through economy and transparency; while the explanatory variables i.e. capacity building, redressal system, use of ICT, procurement planning, and tender advertisement limit are employed to measure economy and transparency in the procurement system.

Figure 1.2: *Efficiency Measuring Framework*



(Source: Ali 2021)

Transparency and economy play a vital role in the procurement process in the view of efficiency. Hence the organization have to take necessary steps to minimize or avoid the deceptions for influencing the efficiency in procurement process. By considering the published literature it can conclude that the efficiency of procurement process does not claim with the view of Sri Lanka Army. It can justify for conducting this research that any of the researches discussed in literature review do not describe the factors affecting to the efficiency of public procurement of Sri Lanka Army.

Accordingly, it can identify following research gap in the area of study as indicated below.

### **1.3 Problem Statement**

The Sri Lanka Army Headquarters has implemented several Procurement Committees and established numerous procurement institutions to streamline and expedite the procurement process, aiming for increased efficiency. This approach involves approved estimates, prompt decision-making, financial allocations, and clear guidelines for easy adoption. Despite policymakers' intentions, it is observed that decentralizing decision-making in procurement activities has not resulted in the desired efficiency of the procurements coming under the votes of Directorate of Ordnance Services of Sri Lanka Army.

Hence, there is a need to investigate the factors affecting efficiency of public procurement functioning under Directorate of Ordnance Services of the Sri Lanka Army.

In general procurement efficiency encompasses several key aspects:

**Cost Savings:** Efficient procurement processes help minimize costs through strategic sourcing, negotiation with suppliers, and bulk purchasing, resulting in significant savings for governments and organizations.

**Timely Delivery:** Streamlined procurement ensures timely delivery of goods and services, which is critical for project deadlines, public services, and disaster response efforts.

**Quality Assurance:** Effective procurement practices include rigorous vendor selection criteria and quality control measures to ensure that procured goods and services meet required standards and specifications.

**Risk Management:** Efficient procurement involves identifying and mitigating risks associated with supply chain disruptions, price fluctuations, and vendor reliability, thus safeguarding against potential disruptions to operations.

**Transparency and Accountability:** Transparent procurement processes promote fairness, integrity, and accountability in decision-making, reducing the risk of corruption, fraud, and favoritism.

**Supplier Relationship Management:** Building strong relationships with suppliers fosters collaboration, innovation, and continuous improvement, leading to better value for money and enhanced service delivery.

**Legal and Regulatory Compliance:** Adhering to legal and regulatory requirements ensures that procurement activities are conducted ethically, legally, and in accordance with established guidelines, minimizing the risk of litigation and reputational damage.

**Data-driven Decision Making:** Leveraging data analytics and performance metrics enables organizations to identify inefficiencies, optimize processes, and make informed decisions to improve procurement outcomes continuously.

Efficient procurement practices contribute to overall economic development by maximizing the effectiveness of public spending, promoting competition and innovation, and creating a conducive business environment for private sector participation.

Further procurement activities play a crucial role in a country's development by ensuring the efficient allocation of resources, stimulating economic growth, and fostering innovation. Efficient procurement processes contribute to economic stability, infrastructure development, and social progress by streamlining the acquisition of goods and services, reducing costs, and promoting fair competition among suppliers. Additionally, efficient procurement practices enhance transparency, accountability, and good governance, which are essential for attracting investments, fostering trust in public institutions, and promoting sustainable development. Overall, a well-managed procurement system can significantly impact a country's socio-economic development and competitiveness in the global marketplace.

According to the Annual Report (Sri Lanka, Ministry of Finance, 2017, p 212) “Sri Lanka Government as being the single largest buyer in the market, around 25 % of its total spending is disbursed through public procurement annually for public service

delivery”. Therefore, public procurement policies are played significant and greater role in the economy.

However, the previous studies have identified that there are many factors influence the efficiency of the procurement process. In this context, there are limited research carried out in relation to the procurement process of Sri Lanka. Accordingly, depend on the insights of previous literature, this study attempts to address the research problem as **“What are the factors affecting to efficiency of public procurement functioning under Directorate of Ordnance Services of Sri Lanka Army ”** focuses its attention towards the identifying and implementing the most efficient actions for the better utilization of limited annual allocations received to the Sri Lanka Army.

#### **1.4 Research Questions**

Studies conducted in Sri Lanka Army are not resolve the problem of determining which factors affecting to efficiency of public procurement functioning under Directorate of Ordnance Services in the view point of utilizing the government funds in Sri Lanka Army in current research context. The aim of the research problem was to answer the following main and sub-divided questions. The main question was:

**“What are the factors affecting to efficiency of public procurement functioning under Directorate of Ordnance Services of Sri Lanka Army?”**

This question was sub-divided into the following sub-questions:

- How professional qualification of solders who engage with procurement activities influence the efficiency of the public procurement process of Directorate of Ordnance Services of Sri Lanka Army?
- How information communication technology affects the efficiency of the procurement process of Directorate of Ordnance Services of Sri Lanka Army?
- How contract management affect the efficiency of procurement process of Directorate of Ordnance Services of Sri Lanka Army?
- How procurement planning process affect efficiency of procurement process of Directorate of Ordnance Services of Sri Lanka Army?

#### **1.5 Research Objectives**

The primary objective of this study is to **“Sought to establish the factors affecting the efficiency of public procurement system functioning under Directorate of Ordnance Services of Sri Lanka Army and introduce possible approaches to overcome the barriers and loopholes in the process”**.

To achieving this, the research focuses on the following objectives:

- To identify how **professional qualification** of soldiers who engage with procurement activities influence the efficiency of the public procurement process of Directorate of Ordnance Services of Sri Lanka Army.
- To assess how **information communication technology**, affect the efficiency of the procurement process of Directorate of Ordnance Services of Sri Lanka Army.
- To identify how **contract management**, affect the efficiency of procurement process of Directorate of Ordnance Services of Sri Lanka Army.
- To assess how **procurement planning process** affect efficiency of procurement process of Directorate of Ordnance Services of Sri Lanka Army.

## **1.6 Significance of the Study**

The spending the government funds of a country plays a significant role in the economy and spending the funds in efficient way is vitally important in the view of achieving economic targets. Studying the procurement process is crucial for ensuring transparency and economy in spending. Transparency helps prevent corruption and ensure fair competition, while a focus on economy ensures resources are utilized efficiently. Understanding procurement process allows organization to identify areas for improvement, streamline operations and ultimately achieving greater efficiency in resource allocation. As same in country level, organizational level efficient procurement activities also more critical to the success of respective organization. Different scholars have conducted many studies in various research contexts to investigate the **factors affecting to efficiency of public procurement process**. However, referring to published articles by different scholars, there are limited research conducted in recent past years in Sri Lanka context. Therefore, it is vitally important in investigating **factors affecting to efficiency of public procurement functioning under Directorate of Ordnance Services of Sri Lanka Army**.

## **1.7 Limitations of the Study**

The study being a quantitative research there are some limitations as indicated below:

This study has examined the factor determinants of government institutional efficiency. Future studies can include other Army organizations, other category of institutional like private sector, semi government organization, educational organization. Moreover, this study has limited the study area only to Directorate of Ordnance Services of Sri Lanka Army and it can be further extended to other Army organization which have caring out the procurement activities to explore national level procurement functioning in Sri Lanka. Further, data collection were done using Google forms due to serving the selected sampling officers in the Army organization all over the country. By considering the time limitation, the sample size was 108 and has limited to 98 respondents and proposed to use larger sample for the future studies. The study has examined only four main efficient determinant factors in procurement functioning and future study can explore the other determinants of the procurement function.

## **1.8 Chapter Outline**

The first chapter elaborates on various aspects of the study which includes an overview of the public procurement of Sri Lanka Army including the relevance of the study to academics, reports and to the industry. Certain gaps in literature, practice and theories related to the efficiency of the procurement and procurement practices studies are highlighted from which the problem of the study is derived. Finally, few limitations of the study will be elaborated. The second chapter reviews literature on Efficiency of Public Procurement and factors affecting to the efficiency of public procurement which are the independent and dependent variables of the study. It attempts to compare and contrast the existing pieces of literature related to the factors in order to obtain a deeper understanding of various theoretical concepts of the existing knowledge. The third chapter explains the methodology of the study, building of the hypotheses and operationalization of the factors and which is in line with the quantitative research design. The developed conceptual framework of the study may include at the beginning of this chapter. Primary data is collected via a field survey supported by a questionnaire. The fourth chapter contains an analysis and the presentation of data. The data gathered through a questionnaire is analyzed using SPSS software in order to facilitate the statistical analysis. The fifth chapter is a summary of the research findings and contains concluding remarks. Gaps that were identified during the study are highlighted as areas, which are of high importance for

further study. Recommendations in terms of industry practices and to the academic background of the existing knowledge has also been included in final chapter.

## **1.9 Chapter Summary**

The introduction chapter includes a brief overview of the procurement functions and key factors of the study. The past studies have identified that there are many factors that affect the efficiency of the procurement functioning. The study area selected which is the factors affecting to efficiency of procurement functioning coming under Directorate of Ordnance Services of Sri Lanka Army and that justified along with the empirical literature related to it and developed the research objectives and questions. The importance and the relevancy of the study have been highlighted on a theoretical base and also as the contribution towards insights for the Sri Lanka Army. Limitations of the study are also pointed out. Finally, a brief summary of the core of all chapters are highlighted as a chapter outline.

# **CHAPTER 2**

## **LITERATURE REVIEW**

### **2.1 Introduction**

Review of earlier researches help a researcher to get a research idea in a specific field of study. Therefore, a systematic review of existing literature on same area or in some other research areas help the researcher to develop an in-depth knowledge and insight into the related earlier studies and have an understanding on current state of knowledge on the topic and also to explore the research gap.

### **2.2 Theories of Procurement**

#### **2.2.1 Institutional Theory**

Institutional theory in procurement focuses on how organizations' behavior and decision-making in procurement are influenced by external pressures, norms and expectations, such as laws, regulations and social norms, shape procurement practices within organizations. Further the organization does not operate in isolation but are influenced by the broader institutional environment. This include factors like government regulations, industry standards, cultural norms and stakeholder expectations. Organization may confirm to these external pressures in their procurement practices to gain legitimacy, reduce uncertainty or maintain the reputation. According to the paper written by Okinyi and Muturi (2016), Institutional Theory helps identify three pillars of institutions as regulatory, normative, and cultural cognitive. The regulatory pillar emphasizes the use of rules, laws, and sanctions as enforcement mechanism, with expedience as basis for compliance. The normative pillar refers to norms and values with social obligation as the basis of compliance. The cultural-cognitive pillar rests on shared understanding on common. As per the Lahdenpera P. (2013), this theory explains government purchasing decisions should not only focus on obtaining goods and services at the lowest cost but also on generating broader societal benefits and a focus on ensuring that the appropriate operational tools and resources are in place to ensure delivery of public

value and the measurement of the value created. As per the Amayi and Ngugi (2013), institutions are composed of cultural cognitive and regulative elements that, together with associated activities and resources give meaning to life. The three pillars of institutions include regulatory, normative and cultural with by all multi-dimensional analysis cognitive. The regulatory pillar emphasizes use of rules, laws and sanctions as enforcement mechanism, with expedience as a basis for compliance. The normative pillar refers to norms and values, social obligation being the basis of compliance. The cultural-cognitive pillar rests on shared understanding. Sarhan and Pasquire (2018), institutional theory pays significant attention to the context. It considers the processes by which structures including rules, norms, and routines become established as authoritative guidelines for social behavior. Further institutional theory emphasized that organizations and actors, operating within a specific context, were pressurized to conform to the requirements and constraints of their institutional environment.

### **2.2.2 Public Value Theory**

According to the Moore M.H. (2014), Focuses on creating public value within the context of public administration and governance. It suggests that public organizations should focus on creating value for society as a whole, beyond just serving their own interests or those of specific stakeholders. This approach emphasizes accountability, transparency and responsiveness to societal needs and values. Public Value Theory can be summarized as an approach used by management of public services based around the three strategies with its combination of the agreement of values and overall strategy, second one being securing of political legitimacy through the authorizing environment, and finally the availability of the appropriate operational capacity.

### **2.2.3 Transaction Costs Theory**

Geyskens and Steenkamp (2006), Transaction Cost Theory is whether a transaction is more efficiently performed within a firm (vertical integration) or outside it, by autonomous contractors (market governance). Transactors are assumed to be “boundedly rational” and “risk neutral,” and at least some actors are assumed to be “opportunistic.” The transaction cost theory assumption is that market governance is more efficient than vertical integration owing to the benefits of competition. Transactions within integrated companies may be insulated from competitive pressure and subject to bureaucratic phenomena. However, certain dimensions of transactions raise transaction costs and combine to create “market failure,” making vertical

integration more efficient than market governance. According to the Rajesh and Tookey (2014), Transaction Cost Theory focuses on the interrelationship between human and environmental factors. Human factors for example; opportunism and bounded rationality have a substantial effect on the customer and supplier relationship in the context of a contractual agreement. Transaction cost theory, suggests that the costs associated with conducting economic transactions influence the decisions of firms regarding the boundaries of their operations. Feedback wise, this theory offers valuable insights into understanding why firms choose to either vertically integrate or engage in market transactions with other firms. By considering the costs of negotiating, monitoring, and enforcing contracts, firms can make more informed decisions about how to structure their operations efficiently. Ismail and Isa (2018), the cost of running and conducting economic transaction in a market may exceed the cost of conducting the transaction within a firm.

In procurement, transaction cost theory is highly relevant as it helps organizations understand the costs associated with acquiring goods and services from external suppliers. By considering factors such as search costs, negotiation costs, contracting costs, and monitoring costs, procurement professionals can make informed decisions about whether to source goods and services internally or externally, and how to structure supplier relationships to minimize transaction costs.

#### **2.2.4 Efficiency of Public Procurement**

Procurement Manual 2006 - Sri Lanka, page no 1, Public procurement is the process by which the procurement entities, purchase the inputs for vital public-sector investments. Those investments, both in physical infrastructure and in strengthened institutional and human capacities, lay foundations for national development. In procurement terms, those inputs are generally grouped into three categories of Works, Goods and Services. The quality, timeliness, appropriateness and affordability of those procured inputs can largely determine whether the public investments will succeed or fail. Public Procurement Re-examined, Thai K.V., Public procurement has a long history and according to the red clay tablet, found in Syria, the earliest procurement order dates from between 2400 and 2800 B.C. The order was for “50 jars of fragrant smooth oil for 600 small weight in grain”. And other evidence of historical procurement includes the development of the silk trade between China and a Greek colony in 800 B.C.

Kakwezi and Nyeko (2019), stated that efficiency reflects that the organization is “Doing things right”. In the sense of procurement efficiency refers to the effectiveness and productivity of an organization’s procurement process and further it aims to optimize the procurement function to contribute to the organization’s strategic goals and enhance its competitive advantage. Nemecek J. (2021), Efficiency was defined as a condition where there is no wastage. When evaluating the efficiency of public procurement, it is possible to focus on a number of dimensions and available evaluation methods. In view of this state, it is necessary to distinguish between allocation and technical efficiency. Allocation efficiency is defined as an optimal allocation of scarce resources in the economy. Allocation efficiency mainly deals with whether the utilization of resources will achieve the desired state. Technical efficiency is defined as production within the constraints of production possibilities, so scarce resources are utilized to the maximum extent possible. Kakwezi P. (2019) to ensure value for money, there should be continuous improvement in the efficiency of internal processes, systems and public entities should maintain structures that avoid unnecessary costs.

### **2.2.5 Factors Affecting to the Efficiency of Public Procurement**

Kiame J.O. (2013), study was attempted to establish factors that influence procurement performance at the Ministry of Energy in Nairobi. The established factors were procurement planning, resources allocation, staff competency and contract management and that factors were further elaborated as follows;

#### **Procurement Planning**

- Need identification and prioritization
- Planning is participatory
- Adherence to procurement plan
- Timely procurements

#### **Resources Allocation**

- Adequacy of allocation of resources
- Budget Reviews to cater for changes in the economic environment
- Tender award based on resources availability and confirmation

#### **Staff Competency**

- Relevance of skills
- Experience

### **Contracts Management**

- Internal controls
- Contract timelines
- Monitoring and evaluation of projects

A research by Nzau and Njeru (2014), has examined how the factors of Procurement Planning, Procurement Staff Competency and Management Support to the procurement activities impact to the procurement performance of public university of Nairobi Country. Okinyi and Muturi (2016) pointed out that, study sought to establish the factors affecting the efficiency of public procurement system in Homa Bay County and Professional Qualification of Employees, Information Communication Technology, Contract Management, Procurement Planning Process are considered as the evaluation factors. According to previous literature on factors affecting to the efficiency of public procurement, the Professional Qualification of Procurement Staff, Information Communication Technology, Contract Management, Procurement Planning affected procurement performance. Accordingly, these factors are empirically proved to have the high influence on efficiency of public procurement.

## **2.2.6 Selected Factors for Studies**

There are several factors affecting to the efficiency of public procurement system such as: supplier relationship management, technology and automation, process standardization, human resource, risk management, performance measurement. However, there are four specific factors namely Professional Qualification of Procurement Staff, Information Communication Technology on Procurement Activities, Contract Management, Procurement Planning are focused in many studies, because they have connection to the procurement efficiency.

### **2.2.6.1 Professional Qualification of Procurement Staff**

Previous studies indicate that Professional Qualification of Procurement Staff impact to the efficiency of the procurement system. The professional qualification of procurement staff can vary widely depending on the industry, the complexity of the procurement activities, and the specific role within the procurement function. Odiaka

O. (2022) pointed out that professionalism in public procurement allows for the functionality, transparency and significant savings in public expenditure. As cited by Ndungu and Were (2020), procurement staffs have two major tasks namely, making sure that their organization comply with rules and regulations guiding procurement practices and participate in procurement activities of their agencies according to the approved budgets. Professionalism depends on the staffing, knowledge, skills and capabilities of human resources and system controls that influence human behavior. Further Professional Qualification of Procurement Staff helps in attaining the right quantity and quality materials from the right suppliers at cheap cost and at the right time required for the production. The development of procurement professionals is one of the key factors in the public procurement that are more quality, timely, and effective. The objectives of procurement professional's development activities include increasing efficiency and saving the public procurement; guarantee the availability of goods and services timely and provide public services as planned through efficiency and savings will be obtained more and more quality goods and services to give positive impact on economic growth, Wibowo R. (2019).

### **2.2.6.2 Information Communication Technology (ICT) on Procurement Activities**

Information and Communication Technology mainly involving in procurement activities through automation, data management and analysis, supplier relationship management, transparency and compliance, strategic sourcing, collaboration and communication, inventory management and risk management areas. Duah and Asiamah (2015), as a matter of necessity, organizations that want to sustain their operations in such an environment must adapt their operational strategies to meet the demands of the day and be able to take advantage of the benefits of doing business electronically. Further E-business has played a very important role in highlighting the importance of procurement as a strategic issue. By introducing electronic procurement many benefits can be realized such as cost savings which can have a direct impact on organizations as well as the customer. Many of such benefits have been cited as reduction in costs, better communication among supply chain players and increased levels of productivity. As cited by Cheptora and Osoro (2018), there are various parts of e-procurement which include electronic contracts, data, orders; sourcing. The e-procurement can be termed as the process of integrating and streamlining procurement processes through the institution. Mabhodha and Choga (2021), the e-procurement system is comprised of indent management, e-tendering, electronic

auctioning, vendor management, catalogue management and contract management and further defined indent management as the software package that involves tender or bids preparations. As cited by Muriuki and Guyo (2021), Electronic procurement in UK Public sector was found to reduce individualist spending, increase supply availability, improved communication and negotiation practices and internal users are provided with support in using the new technology has significant effect on individualist buying. Further reduction in the total cost of acquiring goods and services was realized due to decreased costs of processing purchase requisitions which resulted from improvements made on the procurement system.

### **2.2.6.3 Contract Management in Procurement Process**

Contract management in the procurement process involves critical steps to ensure that agreements between buyers and suppliers are executed efficiently and compliance with relevant regulations. Mainly the contract management process can be sub divided to the Pre Award Phase, Award Phase, Post Award Phase and Contract Renewal and Closure. Further contract management refers to the systematic procedure of ensuring compliance with the terms of a contract and the timely fulfillment of obligations by all involved parties. Furthermore, it is essential to address the aforementioned concerns pertaining to payment, policy specifics, and contract implementation as cited by Hassan and Omwenga (2023). The process of contract management encompasses several key stages, namely the initiation of bidder invitations, the assessment and evaluation of submitted bids, the subsequent awarding of contracts, and the subsequent implementation and execution of said contracts Peters and Stewart (2019). Waigwa and Njeru (2016) stated that the implementation of contract management within a company has the potential to improve various aspects of its operations, including its influence, supplier relationships, product quality, efficiency, flexibility, and overall productivity. The effective administration of contracts plays a crucial role in the achievement of favorable outcomes in the procurement procedures of public sector entities. Successful and efficient contract management practices must meet stakeholders' needs, achieves best value for money, manages the potential risks and liabilities and improves service delivery. Thus, enforcement of regulatory measures must be enforced to avoid pitfalls of inefficient contract management process and eventual poor service delivery Oluka and Basheka (2014). Gatari and Shale (2023), asserts that when getting into a relationship between a supplier and a procuring entity there is need to ensure that both parties achieve their own responsibilities to improve the performance of the contract and this indicates that procurement contractual

relationships are essential to help the procuring entity deliver quality products and services to their clients.

#### **2.2.6.4 Procurement Planning in Procurement Process**

Procurement planning is a critical stage in the procurement process, laying the groundwork for effective and efficient acquisition of products and services. It entails a number of strategic actions to ensure that procurement activities are consistent with the organization's goals and requirements. The main phases of the procurement planning process include need assessment, market analysis, budgeting, risk management, procurement strategy development, compliance and standards, procurement and solicitation planning, timeline and scheduling, approval and review, implementation, and monitoring. Chepkesis and Keitany (218), procurement planning enhances value for money, enhance quality, encourages proper utilization of resources, planning enables quick decision making and planning encourages innovations as it is a problem solving technique and saves time. Further procurement planning procedures should also be reviewed in order to take into account the exact votes as the basis for powering the required goods, works and services. Further, there will be proper utilization of resources, innovation and problem solving techniques once procurement planning procedures are put in place. As mentioned in Procurement Guideline 2006 of Sri Lanka, efficient planning of the entire procurement process is vital to ensure timely completion of the project and to obtain the best market value for it. Basheka B (2009), procurement planning aims to answer the questions of what do you want to acquire? , when do you want to procure it?, when will you use the procurement? , where will you get them? , when will resources be available? , what procurement procedures will you use? , how would timely procurement or failure influence the user of the item?, how can you improve the procurement process?, who will be involved in the procurement?

### **2.3 Empirical Studies**

The literature on efficiency of public procurement refers to how well public sector entities purchase goods, services and works in a manner that maximizes value for money, minimize waste and achieves desired outcomes and to bring efficiency in the public procurement process, certain guiding principles must be observed like the

value of money, economy, transparency, quality of goods & services, and fair competition, without which efficient procurement process will remain questionable Ali and Audi (2021). Mainly the institutional theory, public value theory and transaction cost theory are involved with efficiency of public procurement.

Shiundu and Rotich (2014), stated that the procurement staff should possess sets of skills appropriate in procurement activities. Public entities must ensure that suitable candidates are employed on the basis of merit and placed in their relevant qualifications, skills, and experience with their roles and responsibilities clearly defined to avoid role conflicts with other professions and departments. Kiage J.O. (2013), pointed out that equally, management of the procurement process should be administered by qualified, competent and experienced procurement professionals. This will not only help maintain good procurement standards but also will help achieve high levels of efficiency of procurement process. Therefore, it can be assumed that it is not possible to achieve the efficiency of public procurement without having the qualified procurement staff.

Kiage J.O. (2013), study to ascertain the determinants of procurement performance in public entities a case of Ministry of Energy. Specifically, the study sought to establish the impact of procurement planning on procurement performance, ascertain the influence of resource allocations on procurement performance, discern the impact of staff competency on procurement performance and finally reveal the extent to which contract management in the procurement cycle affects procurement performance. According to the study concludes that planning, resource allocation, staff competency and contract management positively affected procurement performance at the Ministry of Energy.

Ismail and Isa (2018), attempted to identify the common transaction cost incurred in different types of procurement system, that is traditional and design and build to develop a framework in selecting the ideal procurement system based on the transaction cost theory approach. According to the study of Ismail and Isa (2018), transaction cost approach provides a useful framework for analyzing uncertainties in the transaction environment and the relationship between transaction costs incurred in construction project and the types of procurement system is paramount to be explored.

Grega and Orviska (2019), study to find out, what the main factors are in Slovakia that are influencing public procurement efficiency, and based on the analysis, also estimate what is the impact of each factor on the efficiency of public procurement in Slovakia. As per the findings of this paper efficient and effective public procurement

system would be a complex, long-term project. Further study found four key factors, First - amongst other things it would involve fundamental alterations to a large set of hard to change institutional factors beginning with the widespread toleration of corruption, Second - excessive bureaucracy in public procurement, including the impact of and other ethical shortcomings raise procurement costs and may damage the quality supplied, Third - limited competitiveness, in the form of too few bidders, means possible savings are missed, Fourth - excessive use of the lowest-price selection criterion for services and works can adversely affect quality and lead to non-transparent procurer and supplier relations.

Hassan and Omwenga (2023), examined the impact of contract management on the efficacy of procurement processes within state organizations, encompassing contract administration, contract dispute resolution, contract relationship management, contract monitoring, and contract evaluation. The study concludes that state corporations in Kenya will experience enhanced procurement performance when contract administration is enhanced to solve problems related to procurement performance since the study established that contract administration is a significant predictor of procurement performance, contract dispute resolution to solve problems related to procurement, procurement performance will be enhanced since the study established that contract dispute resolution is a significant predictor of procurement performance, enhanced procurement performance when contract relationship management is enhanced to solve problems related to procurement since the study established that contract relationship management is a significant predictor of procurement performance, enhanced procurement performance when contract monitoring is enhanced to solve problems related to procurement since the study established that contract monitoring is a significant predictor of procurement performance, enhance contract evaluation to solve problems related to procurement, procurement performance will be enhanced since the study established that contract evaluation is a significant predictor of procurement performance.

Ali and Audi (2021), exploring the factors which ensure efficiency in public procurement through the economy and transparency and investigates that how to bring efficiencies in the procurement system of Punjab by addressing shortcomings in Public Procurement Regulatory Authority rules. The study finds that, the corrective measures in procurement rules and strong policies at the level of procuring agencies can help to achieve procurement efficiencies. Further this research elaborate The role of information communication technology is very important to bring efficiencies in the procurement system, well-designed and managed capacity-building programs

should regularly be launched by Public Procurement Regulatory Authority for procuring agencies and bidders, annual procurement planning is only assisting the procuring agencies to carry out the procurement in an organized and gifted manner but also providing an opportunity to the vendors to explore the local and international markets for the best competitive rates in advance, adopting a strong redressal mechanism (redressal committees) enables procuring agencies to identify the loopholes in the procurement process and it provides a platform for addressing the grievances of the bidders.

Nzau and Njeru (2014), study the factors affecting procurement performance of public universities in Nairobi county with the specific objectives included, investigating whether procurement department of public universities plan for their procurement activities, whether the staff in the procurement department are competent and also if top level management supports the department in attaining its goals. The study concludes that the departments prepared procurement plans for the activities outlined in the work plans and were within the approved budget for the departments. The departments did not submit their procurements plan to the procurement department in good time within the set deadlines and procurement staff in the university had inadequate professional qualifications in purchasing and supply/ procurement/ supply chain management and had not been adequately trained and sensitized on the procurement procedures of the public procurement act and regulations.

Okinyi and Muturi (2016), investigating factors affecting public procurement efficiency with one of the devolved county governments in Kenya – Homabay used as a case study. The investigation was achieved by; firstly, establishing how professional qualification of employees influence the efficiency of the public procurement process. Secondly assessing how information communication technology affect the efficiency of the procurement function in Public procurement. Thirdly, establishing how contract management affect the efficiency of procurement process in the public sector and lastly, establishing how the procurement planning process affect efficiency of procurement process in the public sector. According to the findings of this study academic qualifications and experience, information communication technology, contract management and procurement planning process greatly influence the efficiency of procurement process in public institution. Proper information communication technology integration, proper planning and contract management process accompanied by right qualification will improve the efficiency and effectiveness of public procurement and enhance customer service delivery in procurement departments in public institution.

## **2.4 Identify the Specific Gaps**

The existing literature on procurement theories and public procurement efficiency has several notable gaps. Firstly, while Institutional Theory, Public Value Theory, and Transaction Costs Theory offer foundational perspectives, there is limited integration of these theories in analyzing the efficiency of public procurement in different contexts, particularly in government section of Sri Lankan. Additionally, much of the research focuses on individual or combine of factors affecting procurement efficiency (such as professional qualifications, information communication technology, and contract management), but there is a lack of studies that holistically examine the interplay between these factors within an amalgamate framework.

This study is positioned to address these gaps by integrating the key theoretical perspectives of Institutional Theory, Public Value Theory, and Transaction Costs Theory into a comprehensive framework for analyzing public procurement efficiency of Directorate of Ordnance Services of Sri Lanka Army. By applying this integrated approach to Directorate of Ordnance Services of Sri Lanka Army, this research will offer new insights into how these theories interact in practice. Furthermore, this study will explore the combined effect of multiple factors (professional qualifications, information communication technology, contract management, and procurement planning) on procurement efficiency, rather than isolate studying them.

## **2.5 Theoretical Contribution and Practical Contribution**

The study contributes to the theoretical discourse by proposing an integrated framework that combines Institutional Theory, Public Value Theory, and Transaction Costs Theory to analyze public procurement efficiency. This theoretical integration addresses the gap in the literature where these theories are often treated separately. The study will provide a new perspective on how these theories can collectively explain the complexities of procurement efficiency, particularly in the context of Sri Lanka Army.

The practical implications of this study are significant for policy makers of Sri Lanka Army, policymakers of Sri Lanka Government, procurement professionals, and public sector managers. By identifying the key factors that enhance procurement efficiency and demonstrating how they interact within a real-world context, the study offers actionable recommendations for improving procurement practices. These insights can

inform the development of policies and strategies that are more effective in achieving procurement efficiency, particularly in Sri Lankan context specially in Sri Lanka Army where resources are limited.

## **2.6 Conclusion**

This chapter attempts to better understanding and explanation on the inputs based on the in-depth exploration of various theories and factors affecting efficiency of public procurement. How organizational procurement practices are influence by the external pressure of the organization is explain by institutional theory. Public value theory highlighted that how to create social value through public sector procurement based on the accountability and transparency. Transaction cost theory analyzes the cost associated with the economic transaction to help organization to decide whether internal sourcing or market transaction. The literature has reviewed that efficiency of public procurement influence by procurement planning, resource allocation, staff competency and contract management. In this efficiency determinant process, the key factors are professional qualification, information communication technology integration, proper contract management and procurement planning. This study fills critical gaps in the existing literature by integrating multiple theoretical perspectives into a comprehensive framework for analyzing public procurement efficiency of Directorate of Ordnance Services of Sri Lanka Army.

## **CHAPTER 3**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

This chapter is intended to describing the methodology of the research and contains a detailed description of the methodology of the study. The first part defines the conceptual framework of the research and it also gives the four hypotheses which are to be tested through the empirical survey. The next part describes the operational definitions of each variable. Thereafter, the research design is elaborated in details with research philosophy, research strategy and research method. Also, the primary data collection process and sampling techniques which are used in the research explained. Finally, it has described the data analyzing techniques to be used in the present research.

#### **3.2 Conceptual Framework**

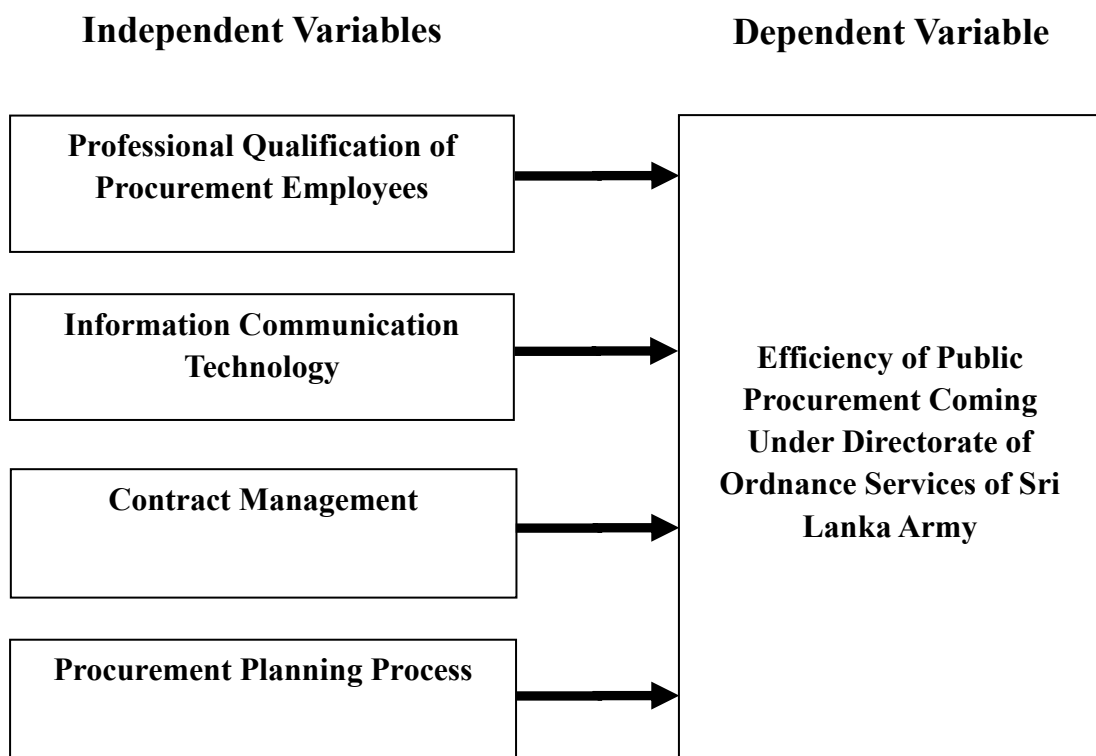
This study aims to identify the factors affecting on efficiency of public procurement system functioning under Directorate of Ordnance Services of Sri Lanka Army and introduce possible approaches to overcome the barriers and loopholes in the process. Accordingly, by referring to previous studies, it can be observed various dimensions have been used to determine the factors affecting to efficiency of public procurement system. Amayi and Ngugi (2013) tested the determinants of public procurement performance in Kenya: case Ministry of Environment, Water and Natural Resources. According to the study test were carried out under the main area of the effect of the legal framework on procurement performance, how professional ethics affects procurement performance in Kenya, to ascertain how information communication technology affects procurement performance in Kenya, determine the influence of senior management support on procurement performance in Kenya and establish the moderating effect of government policy on public procurement performance in Kenya. Okinyi and Muturi (2016) also exploring the factors affecting efficiency of procurement in public institutions based on the case of public entities in Homabay

county. The investigation was achieved by establishing how professional qualification of employees influence the efficiency, how information communication technology affects the efficiency, how contract management affect the efficiency of procurement, how the procurement planning process affect efficiency of procurement process in the public sector. Kiage J.O. (2013) carried out the study by aiming to ascertain the determinants of procurement performance in public entities a case of Ministry of Energy. Specifically, the study sought to establish the impact of procurement planning, resource allocations, staff competency, contract management in the procurement cycle affects procurement performance.

According to the previous studies that the majority of studies relevant to determinant factors of Professional Qualification of Procurement Staff, Information Communication Technology, Contract Management and Procurement Planning to identify the efficiency of the public procurement system. Then, Professional Qualification of Procurement Staff, Information Communication Technology, Contract Management and Procurement Planning Process have been considered as independent variables and dependent variable would be the Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army in this study.

Accordingly, the conceptual framework developed as shown in Figure 3.1.

Figure 3.1: *Conceptual Framework of the Study*



(Source: Developed by researcher)

### 3.3 Hypothesis

Above conceptual framework reflects a complete picture of the determinant factors which can influence the efficiency of public procurement coming under Directorate of Ordnance Services of Sri Lanka Army which developed based on the literature review in chapter two. Accordingly, it can be observed that mainly four determinant factors highlighted in previous studies which influencing efficiency of public procurement coming under various organization and these studies mainly shown the positive significant as briefed in following paragraph.

According to research conducted by Okinyi and Muturi (2016) the determinant factors such as professional qualification of employees, information communication technology (ICT), contract management, procurement planning process affect efficiency of procurement process of the one of the devolved county governments in Kenya – Homabay. The results found out that four variables that are, academic qualifications and experience, information communication technology, contract management and procurement planning process greatly influence the efficiency of procurement process in public institution. Proper information communication technology integration, proper planning and contract management process accompanied by right qualification will improve the efficiency and effectiveness of public procurement and enhance customer service delivery in procurement departments in public institution. Findings of the research conducted by Shiundu and Rotich (2014) show that the determinant factors including Employee Competency, Information Technology, Management Styles, Records Management are high impact on efficiency of procurement systems at the City Council of Nairobi.

Based on these previous studies this research supposed that there is a significant influence of determinant factors on efficiency of public procurement coming under Directorate of Ordnance Services of Sri Lanka Army. Accordingly, based on the findings related to the previous scholars, the efficiency of public procurement coming under Directorate of Ordnance Services of Sri Lanka Army the hypotheses of this study are as follows;

**H<sub>1</sub>** – There is a significant positive relationship between Professional Qualification of Procurement Employees and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

**H<sub>2</sub>** – There is a significant positive relationship between Information Communication Technology and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

**H<sub>3</sub>** – There is a significant positive relationship between Contract Management and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

**H<sub>4</sub>** – There is a significant positive relationship between Procurement Planning Process and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

### **3.4 Research Design**

The research process aims to arrive at a reasoned conclusion by logically generalizing of known facts about efficiency of public procurement coming under Directorate of Ordnance Services of Sri Lanka Army.

This research uses quantitative approach as research strategy. The research conduct as a quantitative research and which follow the positivism research paradigm. It is based on deductive research approach. As cited by Glasow P.A. (2005) survey research having three distinguishing characteristics. First, survey research is used to quantitatively describe specific aspects of a given population and these aspects often involve examining the relationship among variables. Second, the data required for survey research are collect from people and are, therefore subjective. Thirdly, survey research uses a selected portion of the population from which the findings can later be generalized back to the population. Therefore, survey method is suitable for this kind of study because it can collect data to ascertain facts on efficiency of public procurement coming under Directorate of Ordnance Services of Sri Lanka Army and then the survey method is used for this study. Accordingly, research approach of this study is explained Figure 3.2 below.

Figure 3.2: *Research Approach*



This study used primary data and which was collected using questionnaires containing a mixture of structured and a five-point Likert Scale questions. Structured questions are preferred for the study which are easier to analyze since they are in an immediate usable form and test the empirical relationships in data. The data will collect only one time from the individual officers who directly involve with the procurement activities of the Directorate of Ordnance Services of Sri Lanka Army. The study used primary data and data collected using questionnaires from a selected purposive sample. Accordingly, unit of analysis is officers who directly involve with the procurement activities of the Directorate of Ordnance Services of Sri Lanka Army.

### 3.5 Primary Data Collection

Among various kinds of data collection methods such as structured interviews, semi structured interviews, unstructured interviews, self-completion questionnaire, observation, group discussion the self-completion method is chosen for collecting quantitative data for this study. Self-completion questionnaire seems to be one of the most common methods of quantitative researches. With a self-completion questionnaire, respondents answer questions by completing the questionnaire themselves. This method is chosen for some reasons. The first reason is that as the research questions are defined clearly, questionnaire is the best choice to have standardized data, which is easily to process and analyze. Especially, as no interviewers present when the questionnaires are completing, the results may not be affected by the interviewers Bell and Bryman (2007).

Furthermore, as the respondents are officers who directly involve with the procurement activities of the Directorate of Ordnance Services of Sri Lanka Army, they may not have much time for interviews, thus, questionnaires may make them feel more comfortable because they can do it whenever they have free time. Questionnaires also are more convenient for respondents in case they need to provide some sensitive information, in other words; they tend to be more honest than in an interview Bell and Bryman (2007).

According to Saunders and Lewis (2009) the self-administered questionnaires are divided into three groups called as internet and intranet-mediated questionnaires, postal questionnaire, and delivery-collection questionnaire according to the way of distributing. The third option is to delivery-collection questionnaire by hand to each respondent and collected right after completing it. In this research, this third option (delivery-collection questionnaire by hand) is selected to collect the primary data. Questionnaires were distributed within the officers who directly involve with the procurement activities of the Directorate of Ordnance Services of Sri Lanka Army. As officers have great involvement with procurement activities and facing for the issues of the procurement process, the response rate is expected to be high.

Accordingly, the study used primary data gathered from the individual officers who involve with procurement activities by using structured questionnaire. The questionnaire was structured into two sections. Section 1 sought to capture the general data about the officer. Section II will be concerned with the data on factors that affect on efficiency of public procurement system of Directorate of Ordnance Services. The developed questionnaire included items which corresponded to professional qualification of procurement employees, information communication technology, contract management, procurement planning factors. Respondents were asked to indicate their degree of how they are influenced by each of the items on five point Likert Scale. Primary data was collected using questionnaires (See the detailed questionnaire in Appendix I) which were designed to measure the degree of determinant factors of efficiency of public procurement of Directorate of Ordnance Services. The questionnaires were administered to the individual personally. This method was appropriate since it encouraged prompt responses from the respondents.

### **3.6 Sampling Procedure**

Campbell and Greenwood (2020) mentioned that adopting a purposive sampling strategy are based on the assumption that, given the aims and objectives of the study, specific kinds of people may hold different and important views about the ideas and

issues at question and therefore need to be included in the sample. The purposive sampling method was selected based on the include the officers who are directly engage with the procurement activities with the purpose of ensuring the Directorate of Ordnance Services related procurement knowledge, expertise and specific knowledge attributes officers are engage with this research work. Furthermore, if selected, the other officers involved in the other procurement activities of engineering services, ration supply, and other service-related procurements of air ticketing, transport supplying in the Sri Lanka Army will be less subjective and will not be able to attribute specific knowledge related to the procurements of the Directorate of Ordnance Services to this study. Accordingly, the target population and sample is 108 nos of the Sri Lanka Army Officers who are directly involving the procurement activities of Directorate of Ordnance Services. The study will be based on the primary data collected from 98 respondents. Questionnaires are sent to respondents using purposive sampling method.

### **3.7 Preparation of the Data Base**

#### **3.7.1 Data Entering**

The data preparation has done based on the SPSS package. To prepare this data base for analysis, few steps are runs to be checked weather there are any unusual value, missing values or outliers in the data set. The study proposed to test the assumptions which needs to run parametric test. As the first step check the accuracy of data entering by checking unusual values in the data set.

#### **3.7.2 Data Editing**

Excel data sheet was used to record the data by importing from the Google forms and edited with the identification code for each statement of the questionnaire. This identification number is used when coping the data in to SPSS data view to save the time and maintain the accuracy of the data entering process.

#### **3.7.3 Coding**

Collected data are entered in to the data matrix using a numerical code. When coding the respondents' demographic information, it was used a numerical scale as appropriate and five point Likert Scale was used to code the respondents reply for each question of the questionnaire which designed to explore the individual officer's determinant factors.

#### **3.7.4 Data Accuracy**

It is much important to that the data set is entered accurately before conducting the analysis. Each scale in the questionnaire data items in the data sheet was double

checked to see whether there are any unusual codes are entered in to the data sheet. Range of each variable was calculated and checked whether it exceeded maximum range possible. In comparing range it was careful to refer to the maximum and minimum range of respective Licket scale of each column.

### **3.7.5 Missing Data**

At the end of the data entering data sheet was doubled check to see whether there are any missing value due to mistakes in data entering phase. The study analyzed the collected data via Statistical Package for the Social Sciences to achieve the objectives of this study which include:

- **Frequencies and percentages:** To describe the demographic features for the study of respondents.
- **Arithmetic average and standard deviation:** To detect the response of the study on the variables.
- **Multi-colleniority Test:** Normality test to verify the model fitting.
- **Multiple regression method:** To measure the impact of the relationship between more than one independent variable and the dependent variable.

### **3.8 Data Analysis Techniques**

The quantitative data collected through the questionnaire will be coded and entered into Statistical Packages for Social Scientists (SPSS). Then, statistical techniques used for the data to achieve the research objectives, which may include descriptive statistics of frequency tables, percentages, means, standard deviation. Descriptive statistics are also used to describe the influence level of key determinant factors on efficiency of procurement process and these descriptions help to test the hypothesis which are mentioned in the section 3.3. Also factor analysis which helps to analyze the structure of correlations among many variables by identifying a set of factors and which also helps to test the hypothesis in section 3.3.

When they were having more than one independent variable, it needs to run a multiple regression analysis. Also to consider the demographic variables, it will be created and introduced the dummy variables to the data set to treat them as controlling variables. Multiple regression analysis is accessible to reveal which of the variables have the most and least influence on efficiency of the procurement process. According to Rubinfeld D.L, Multiple regression analysis is a statistical tool for understanding the relationship between two or more variables and multiple regression involves a

variable to be explained, called the dependent variable and additional explanatory variables that are thought to produce or be associated with changes in the dependent variable. Therefore, following equation will be used as a stepwise regression model for this study and this structural model shows the nature of relationship between the independent variables, efficiency of public procurement of Directorate of Ordnance Services and the dependent variable of this study.

The regression equation;

$$Y = \beta_0 + \beta_1 PQF + \beta_2 ICT + \beta_3 CM + \beta_4 PPF + \varepsilon$$

Where: Y = Efficiency of Public Procurement of Directorate of Ordnance Services;  $\beta_0$  = Constant value;  $\beta_1, \beta_2, \beta_3, \beta_4$  = Regression Coefficients; PQF = Professional Qualification Factors; ICT = Information Communication Technology Factors; CM = Contract Management Factors; PPF = Procurement Planning Factors;  $\varepsilon$  = Error Term

## **CHAPTER 4**

### **DATA PRESENTATION AND ANALYSIS**

#### **4.1 Introduction**

This chapter outlines the results of the data analysis using SPSS software package. The initial section of the chapter describe the data collection and profile of the sample selected. Next section of the chapter presents the descriptive statistics and preliminary analysis of the data. Final section of the chapter contains the results of the hypothesis testing done on the screened data which provide answers to the research question and data analysis, results and presentation of findings based on the objective of this study. The objective of this study was sought to establish the factors affecting the efficiency of public procurement system functioning under Directorate of Ordnance Services of Sri Lanka Army and introduce possible approaches to overcome the barriers and loopholes in the process. The analysis used in this study includes, reliability analysis to check the health of data for analysis, validity of the data set, descriptive statistics, correlation analysis and regression analysis to test hypotheses.

#### **4.2 Preparation of the Data Base**

##### **4.2.1 Data Collection and Response Rate**

A questionnaire has been adapted from past literature to collect data from individual Army officers for analysis. Total 108 questionnaires were distributed to Army officers through Google Forms, out of which 98 questionnaires are returned by respondents. The response rate of the officers was 90.74%. They are shown in Table 4.1.

*Table 4.1: Survey Response*

<b>Sample</b>	<b>Total Respondents</b>	<b>Not responded</b>	<b>Respond Rate</b>
108	98	10	90.74%

(Source: Survey Data, 2024)

According to Kepha and Mukulu (2012), which represents a response rate of 71.9%. A response rate of 71.9% is adequate for satisfactory to draw conclusions from the study. Therefore, this response rate was good, sufficient and representative. The sampling technique to be used in this study is purposive sampling. Descriptive analysis and multiple regression analysis are used to analyze the collected data. Ultimately, 98 questionnaires were entered in the data base for the analysis. It is not observed any unusual values in the data set according to the Frequency table shown in Annex “A” which includes Test of unusual value, missing values and outliers in the data set.

### **4.3 Demographic Characteristics and Analysis of Sample Profile**

The study attended to discover the background information of the respondents in terms of their gender, age, highest education qualification, experience since such information is important in defining the respondent in relation to procurement. Considering the total sample statistics are observing while total sample is 98 and details as shown in Table 4.2 below.

*Table 4.2: Frequencies of the demographic variables*

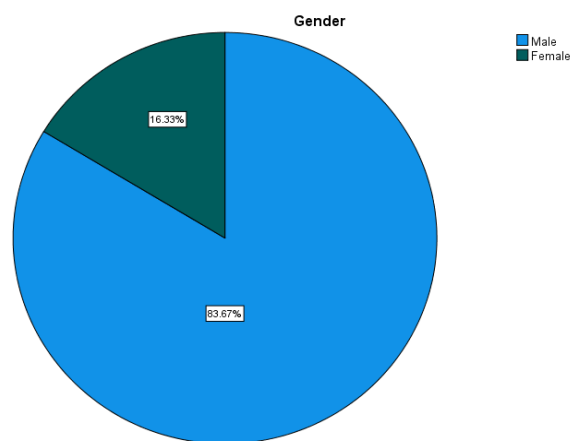
	<b>Gender</b>	<b>Age</b>	<b>Highest Education Qualification</b>	<b>Working Experience</b>
N Valid	98	98	98	98
N Missing	0	0	0	0
Mean	1.33	2.47	1.33	1.87
Median	1.00	2.00	1.00	2.00
Std. Deviation	0.471	1.008	0.528	0.805
Variance	0.222	1.016	0.279	0.648
Minimum	1	1	1	1
Maximum	2	5	3	3

(Source: Survey Data, 2024 analysis using SPSS)

### 4.3.1 Gender of the Respondents

The findings shows that 83.67% (82) of the respondents were male while 16.33% (16) were female as indicated in the pie chart in Figure 4.1 below. This implies that respondents were drawn from all the gender group to explain any gender biasness that might have been associated with the findings (Demographic information table shown in Annex “B”).

Figure 4.1: *Gender of respondents*

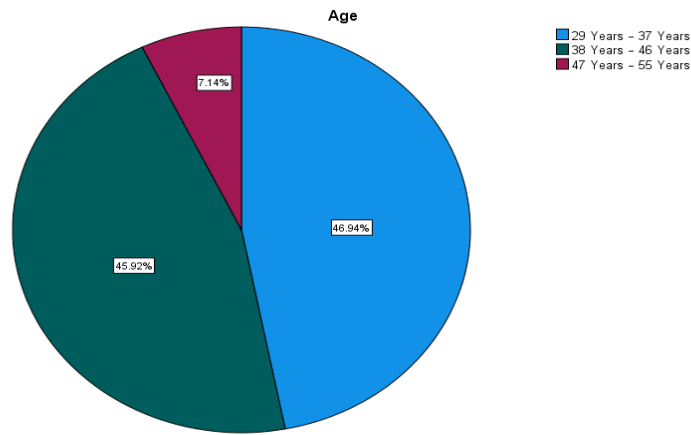


(Source: Survey Data, 2024 analysis using SPSS)

### 4.3.2 Age of the Respondents

The findings indicate that 46.94% (46) of the respondents were between the age 29 years to 37 years, 45.92% (45) were between the age of 38 years to 46 years, 7.14% (7) of the respondents were between the age 47 years to 55 years as shown in Figure 4.2 below (Demographic information table shown in Annex “B”).

Figure 4.2: *Age of the respondents*

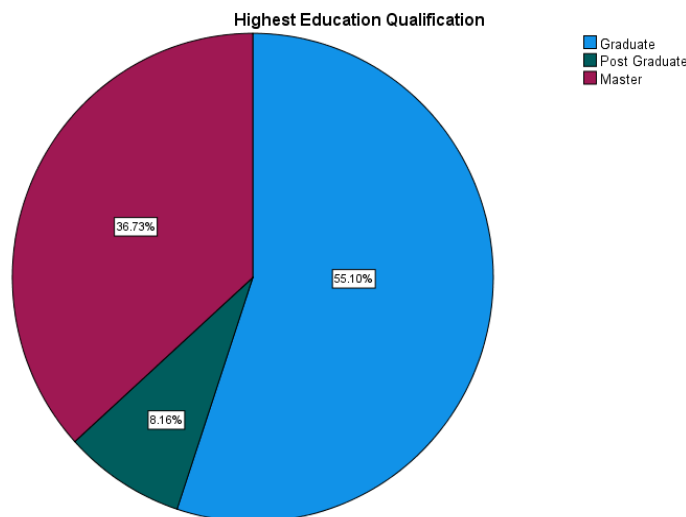


(Source: Survey Data, 2024 analysis using SPSS)

### 4.3.3 Highest Education Qualification of the Respondents

The findings indicate that 55.10% (54) of the respondents are graduates, 8.16% (8) of the respondents are post undergraduates and 36.73% (36) respondents held master degree. This implies that majority of officers with the procurement process of Directorate of Ordnance Services hold a basic degree as shown in Figure 4.3 below (Demographic information table shown in Annex “B”).

Figure 4.3: *Highest Education Qualification of the respondents*



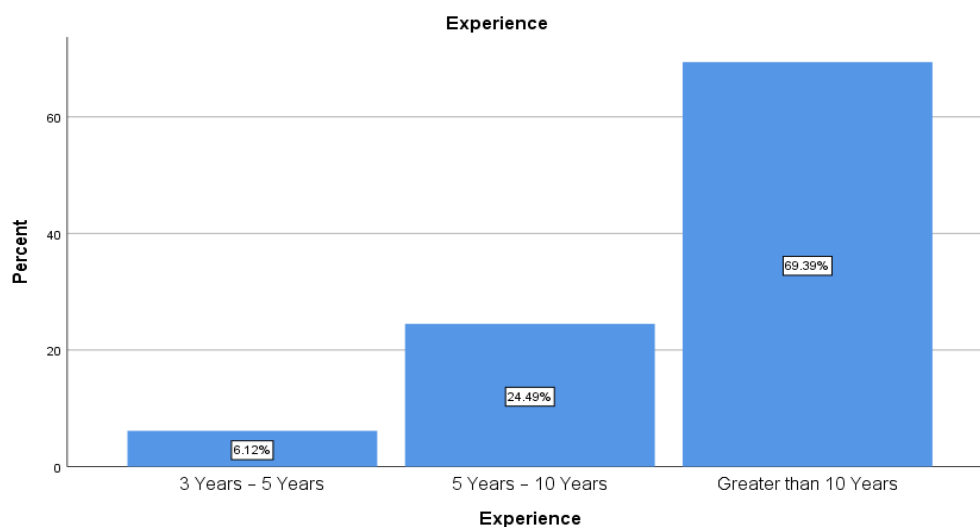
(Source: Survey Data, 2024 analysis using SPSS)

### 4.3.4 Working Experience of the Respondents

The study revealed that 6.12% (6) of the respondents have less than 5 years working experience, 24.49% (24) officers have 5 years to 10 years working experience while 69.39% (68) respondents indicate more than 10 years working experience. This means

that the total percentage of 93.88% of individual officers with the procurement process of Directorate of Ordnance Services represent more than 5 years working experience as illustrated in Figure 4.4 below (Demographic information table shown in Annex “B”).

Figure 4.4: *Working experience of the respondents*



(Source: Survey Data, 2024 analysis using SPSS)

#### 4.4 Reliability Test

The research will be using Cronbach’s alpha value for each individual behavioral factor to test the reliability. The data is considered reliable if the value of Cronbach’s alpha is equal or greater than .70. Alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from dichotomous (that is, questions with two possible answers, and/or multi-point formatted questionnaires or scales (i.e., rating scale: 1 = poor, 5 = excellent). The higher the score, the more reliable the generated scale will be. The data for reliability analysis consisted on total of 30 items of both independent variables and, dependent variable. Cronbach's Alpha was used revealed that Cronbach's alpha coefficient was 0.807 for all items, and values of ( $\alpha$ ) range 0.700 to 0.902, which indicates that the questionnaire was reliable and quite satisfactory. The values of ( $\alpha$ ) of the study variables of were as illustrated in Table 4.3 Below. (The technical table (SPSS Assessment of Reliability test) of the reliability test is shown in Annex “C”).

Table 4.3: *Reliability Statistics of the Measures*

Measures (Variables)	Cronbach's alpha ( $\alpha$ ) > 0.7 (Reliability Coefficient)	Number of Items
PQPE	0.700	6
ICT	0.781	6
CM	0.902	6
PPP	0.807	6
EPP	0.845	6
<b>General rate</b>	<b>0.807</b>	<b>30</b>

(Source: Survey Data, 2024 analysis using SPSS)

Note. PQPF – Professional Qualification of Procurement Employees Factor, ICT – Information Qualification Factor, CM – Contract Management Factors, PPP – Procurement Planning Process Factors, EPP – Efficiency of Public Procurement Effect.

## 4.5 Test of Validity

Factor analysis is used to test the construct validity (Timothy and Brown 2013). There are two types of factor analysis, exploratory and confirmatory factor analysis. Confirmatory factor analysis is used to confirm that the factor structure of the data is collected same as the factor structure suggested in the theory. Out of these theoretical ground exploratory factor analysis was conducted in this research for the collected data set of the construct each variables.

### 4.5.1 Factor Analysis of Variables Influencing the Efficiency of Public Procurement Functioning Under Directorate of Ordnance Services of Sri Lanka Army

The 30 questions of the questionnaire are designed to explore the levels of influence on the Efficiency of Public Procurement Functioning Under Directorate of Ordnance Services of Sri Lanka Army. Whereas, the questions are developed to identify five main factors under the Professional Qualification of Procurement Employees, Information Communication Technology, Contract Management, Procurement Planning Process, Efficiency of Public Procurement.

The exploratory factor analysis method is used to identify the factors which these variables belong to under each loading and the requirements of factor analysis are satisfied to reduce the variables. After some rounds of eliminating the unfitting variables, the analysis results that the residual variables are grouped into six factors. Moreover, factor loading value below 0.4 removed and variables and variable items were valid, since their factor loading values were more than 0.4. As cited by Peterson R.A. (2000), the factor loadings greater than  $\pm 0.30$  are considered to meet the minimal level; loadings of  $\pm 0.40$  are considered more important; and if the loadings are  $\pm 0.50$  or greater, they are considered practically significant to the analyzed data.

Therefore, the factors confirmed the factorial validity of the questionnaire (Extraction is between 0.419 to 0.741) and Table 4.4 represents these results.

Table 4.4: *Factor Analysis for Key Determinant Variables*

Variable	Components					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
The procurement staff possess the necessary professional qualifications to perform their duties efficiently.	.494					
Continuous professional development for procurement staff enhances the efficiency of the procurement process.	.553					
The procurement staff possess adequate knowledge of procurement regulations and guidelines.	.465					
The professional expertise of procurement staff contributes to timely procurement of goods and services.	.428					
The procurement staff are skilled in negotiating with suppliers to obtain the best value for money.	.422					
The experience of procurement staff in procurement activities leads to fewer errors and delays in the process.	.490					
The use of ICT tools in procurement activities significantly improves the overall efficiency of the procurement process.	.495					
Electronic procurement systems enhance transparency in the procurement process.		.419				

ICT integration in procurement allows for better data management and analysis.		.556			
The use of e-procurement reduces the cost of procurement transactions.		.487			
ICT enables effective communication and collaboration with suppliers.		.495			
The automation of procurement activities through ICT leads to timely procurement and delivery of goods and services.		.550			
Effective contract management practices ensure compliance with procurement regulations and reduce associated risks.			.621		
The systematic monitoring of contracts helps in achieving procurement objectives.			.596		
Proper contract management reduces the risks associated with procurement activities.			.623		
Contract management processes are clearly defined and followed within the organization.			.542		
The organization effectively resolves disputes arising from procurement contracts.			.500		
The renewal and closure of contracts are managed efficiently to avoid disruptions in procurement.			.643		

The procurement planning process is aligned with the organization's strategic goals and involves regular review and updates to reflect current needs and conditions.				.447		
Adequate market analysis is conducted during the procurement planning phase.				.558		
Procurement planning helps in identifying and mitigating risks associated with procurement activities.				.473		
The organization follows a well-defined procurement strategy during the planning process.				.528		
Procurement plans are reviewed and updated regularly to reflect current needs and conditions.				.517		
The procurement planning process ensures the timely availability of goods and services.					.565	
The procurement process effectively meets the organization's needs for goods and services.					.541	
The procurement process minimizes waste and maximizes value for money.					.741	
The procurement activities are completed within the planned timeframe.					.721	
The procurement process ensures the procurement of high-quality goods and services.					.719	
The procurement process is transparent and free from corruption.						.625

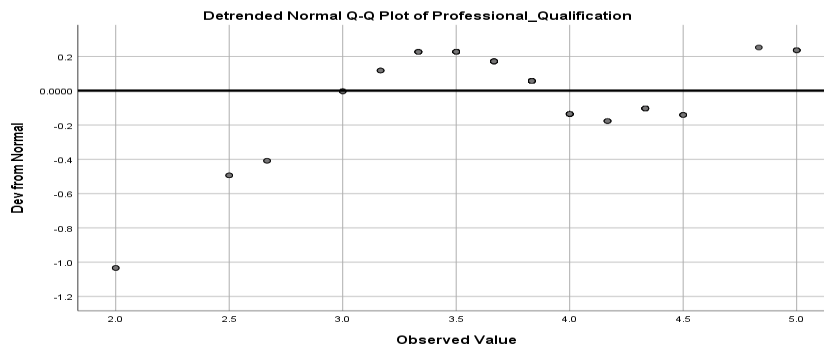
The procurement process involves fair competition among suppliers.						.594
--	--	--	--	--	--	------

(Source: Survey Data, 2024 analysis using SPSS)

### 4.5.2 Test of Linearity

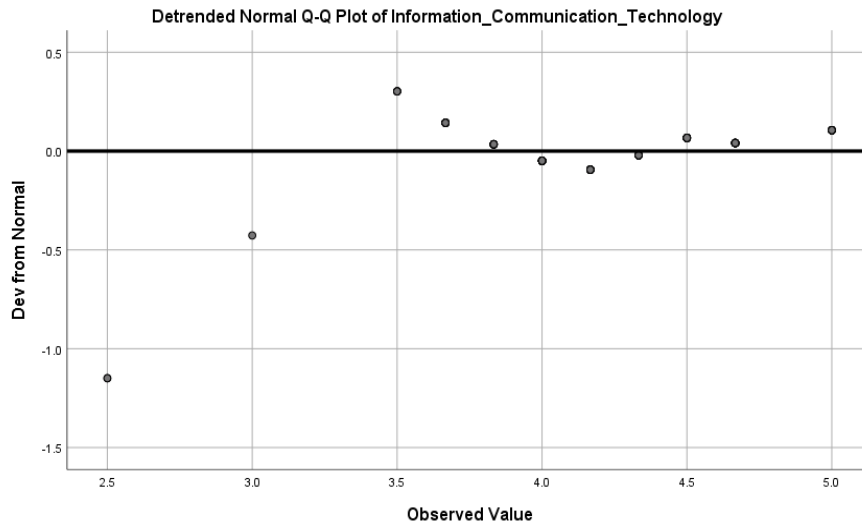
The Linearity assumption asserts that there is a straight line relationship between each pair of variables (Dependent variable with each independent variable). Thus, all the data items in the data set were examined for linearity using the scatter and residual plots. Even though a clear linearity is not observed in the scatter and residual plots all the correlations are significant. Therefore, the linearity of the data set is assured, SPSS Assessment of linearity analysis is shown in following Figures.

Figure 4.5: *Scatterplot Diagram of Professional Qualification Factor*



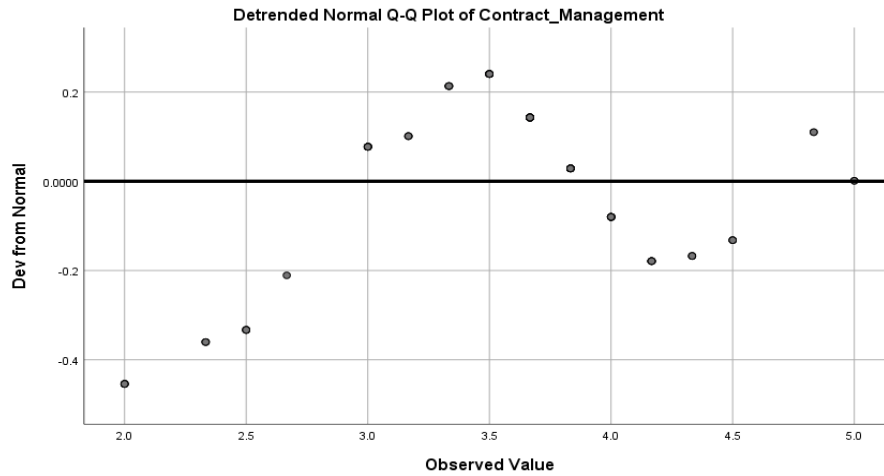
(Source: Survey Data, 2024 analysis using SPSS)

Figure 4.6: *Scatterplot Diagram of Information Communication Technology Factor*



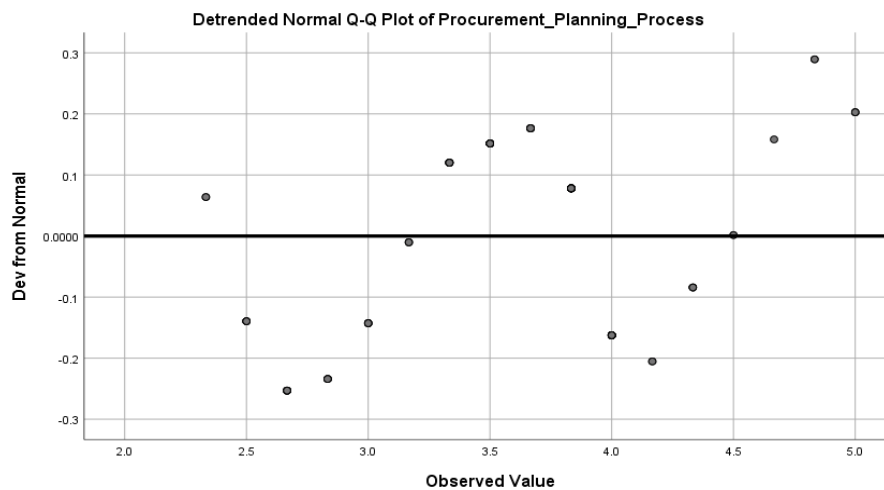
(Source: Survey Data, 2024 analysis using SPSS)

Figure 4.7: *Scatterplot Diagram of Contract Management Factor*



(Source: Survey Data, 2024 analysis using SPSS)

Figure 4.8: *Scatterplot Diagram of Procurement Planning Process Factor*

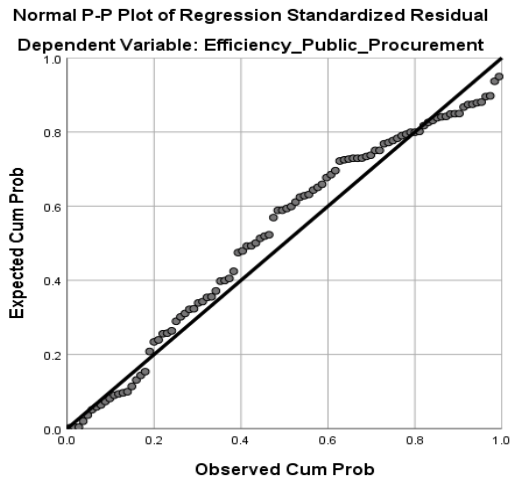


(Source: Survey Data, 2024 analysis using SPSS)

### 4.5.3 Test of Values of the Residuals are Normally Distributed

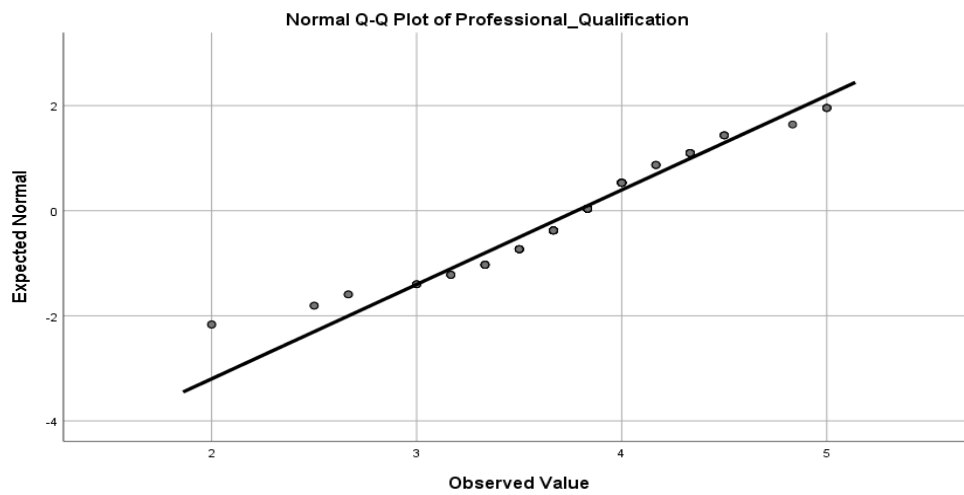
Normal probability plots for standardized residuals values ( $Y - *ZRESID$ ) and standardized predicted values ( $X - *ZPRED$ ), the closer the dots lie to the diagonal line, the closer to normal residuals are distributed. Therefore, it can be concluded that all the residuals are normally distributed in all independent variable together and pair of dependent variable with each independent variable separately. Thus, this assumption is satisfied as shown in following graphs.

Figure 4.9: *Normal P-P Plot of Regression Standardized Residual – All Independent Variables*



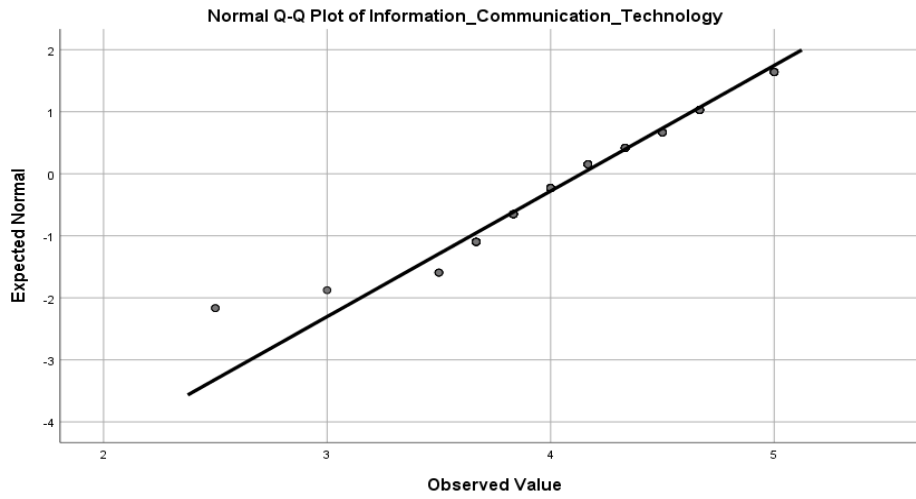
(Source: Survey Data, 2024 analysis using SPSS)

Figure 4.10: *Normal P-P Plot of Regression Standardized Residual – Professional Qualification*



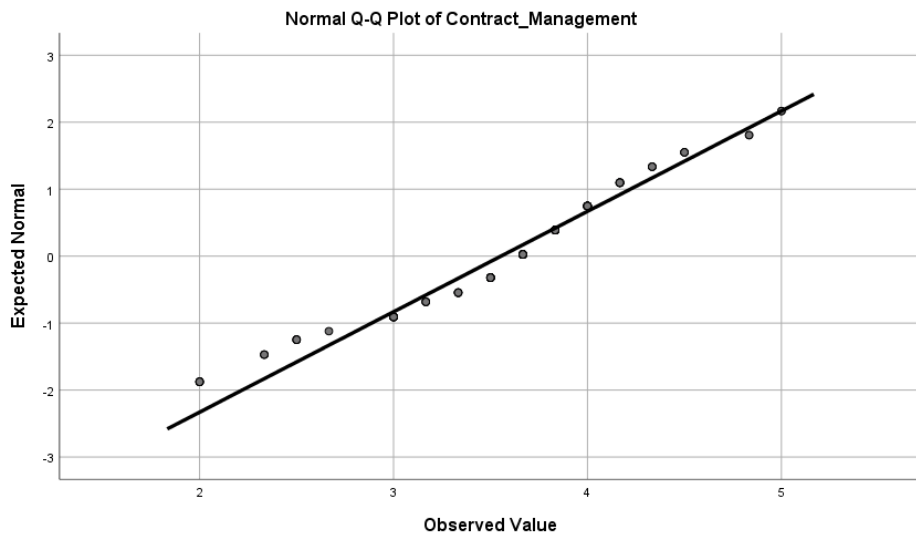
(Source: Survey Data, 2024 analysis using SPSS)

Figure 4.11: *Normal P-P Plot of Regression Standardized Residual – Information Communication Technology*



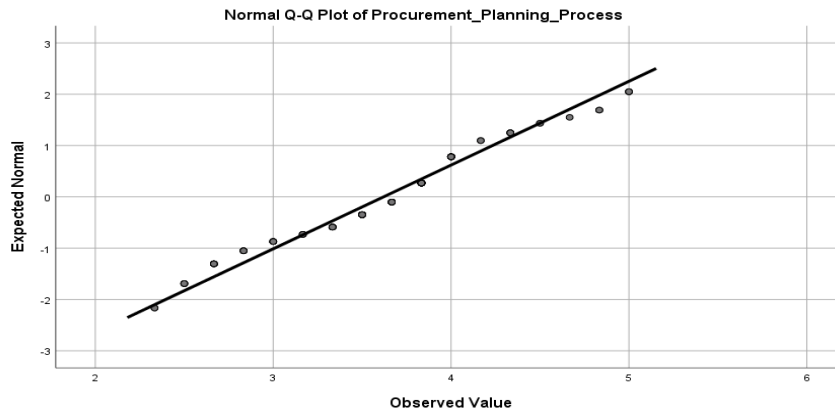
(Source: Survey Data, 2024 analysis using SPSS)

Figure 4.12: *Normal P-P Plot of Regression Standardized Residual – Contract Management*



(Source: Survey Data, 2024 analysis using SPSS)

Figure 4.13: *Normal P-P Plot of Regression Standardized Residual – Procurement Planning Process*



(Source: Survey Data, 2024 analysis using SPSS)

#### 4.5.4 Multi-Collinearity

For the current study to test the existence of multi-collinearity phenomena between among the construct, Pearson correlation coefficients calculated between independent variables, the results of testing multi-collinearity between independents variables were explained by correlation matrices. By looking at the value in Table 4.5, it can be concluded that the current study is free of the multi collinearity. (SPSS Assessment of linearity analysis is shown in Annex “D”.)

Table 4.5: *Correlations Statistics*

<b>Variables</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Professional Qualification	1.000			
Information Communication Technology	.488**			
Contract Management	.376**	.317**		
Procurement Planning Process	.436**	.263**	.282**	1.000

(Source: Survey Data, 2024 analysis using SPSS)  
 \*\*. Correlation is significant at the 0.01 level (2-tailed).  
 Note. 0 - Professional Qualification, 1 – Information Communication Technology, 2- Contract Management, 3 – Procurement Planning Process

(Source: Survey Data, 2024 analysis using SPSS)

Table 4.5 shows that the maximum value of correlation coefficient was between Professional Qualification and Information Communication Technology, otherwise the values were less than or equals 0.488, which means there were no perfect relationship between variables.

#### 4.5.5 Cook’s Distance

It is tested by Cook's distance to check whether there are no influential cases biasing in the model. However, it was not observed of any value greater than 1 in the Cook's distance as indicated in Table 4.6. Therefore, it was not problematic and this assumption is also satisfied.

Table 4.6: *Residuals Statistics*

<b>Residuals Statistics</b>					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.9217	4.9001	3.4456	.50787	98
Std. Predicted Value	-3.000	2.864	.000	1.000	98
Standard Error of Predicted Value	.044	.205	.085	.030	98
Adjusted Predicted Value	1.8548	4.8891	3.4470	.50845	98
Residual	-1.12187	.65330	.00000	.38990	98
Std. Residual	-2.817	1.641	.000	.979	98
Stud. Residual	-3.027	1.690	-.002	1.010	98
Deleted Residual	-1.29527	.69346	-.00145	.41506	98
Stud. Deleted Residual	-3.171	1.708	-.007	1.023	98
Mahal. Distance	.191	24.709	3.959	3.843	98
Cook's Distance	.000	.283	.013	.032	98
Centered Leverage Value	.002	.255	.041	.040	98

a. Dependent Variable: Efficiency Public Procurement

(Source: Survey Data, 2024 analysis using SPSS)

## 4.6 Test of Hypothesis

### 4.6.1 Multiple Regression Analysis for Hypotheses Testing

According to Masom and Perreault (1991), with the help of multiple regression analysis, it could find the linear combination of a set of predictors that provides the best point estimates of the dependent variable across a set of observations and could measure the impact of several independent variables individually or jointly together on the dependent variable. Accordingly, following regression equation was runs in stepwise for this study and this structural model shows the nature of relationship between the independent variables, efficiency of public procurement of Directorate of Ordnance Services and the dependent variable of this study.

The regression equation;

$$Y = \beta_0 + \beta_1 PQF + \beta_2 ICT + \beta_3 CM + \beta_4 PPF + \varepsilon$$

Where: Y = Efficiency of Public Procurement of Directorate of Ordnance Services;  $\beta_0$  = Constant value;  $\beta_1, \beta_2, \beta_3, \beta_4$  = Regression Coefficients; PQF = Professional Qualification Factors; ICT = Information Communication Technology Factors; CM = Contract Management Factors; PPF = Procurement Planning Factors;  $\varepsilon$  = Error Term

Hypotheses of the study:

**H<sub>1</sub>** – There is a significant positive relationship between Professional Qualification of Procurement Employees and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

**H<sub>2</sub>** – There is a significant positive relationship between Information Communication Technology and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

**H<sub>3</sub>** – There is a significant positive relationship between Contract Management and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

**H<sub>4</sub>** – There is a significant positive relationship between Procurement Planning Process and Efficiency of Public Procurement Coming Under Directorate of Ordnance Services of Sri Lanka Army.

#### 4.6.1.1 Model Summary

Table 4.7: *Model Summary*

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.793	.629	.613	.39819

(Source: Survey Data, 2024 analysis using SPSS)

The regression model has been applied in order to evaluate the hypothesis. The model summary table 4.6.1.1 indicates that the value of the adjusted R Squared ( $R^2$ ) amount to 0.613 which is 61.3%. This shows that the factors are not covered amount only 38.7% . It therefore, means the four factors of Procurement Planning, Information Communication Technology, Contract Management and Professional Qualification have a big role in the efficiency of public procurement process of Directorate of Ordnance Services of Sri Lanka Army.

Accordingly, the model can explain the dependent variable by the independent variables. And shows strong direct correlation.

#### 4.6.1.2 ANOVA for all Variables

Table 4.8: *ANOVA Table*

		ANOVA				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.020	4	6.255	39.449	.000 <sup>b</sup>
	Residual	14.746	93	.159		
	Total	39.765	97			

a. Dependent Variable: Efficiency of Public Procurement

b. Predictors: (Constant), Procurement Planning Process, Information Communication Technology, Contract Management, Professional Qualification

(Source: Survey Data, 2024 analysis using SPSS)

The ANOVA results for all variable indicates that there was a highly significant relationship between the variables at  $F = 39.449$  and  $P = 0.000$ . This implies that there is a strong relationship between the four variables of Procurement Planning, Information Communication Technology, Contract Management and Professional Qualification and Efficiency of Public Procurement Functioning under Directorate of Ordnance Services of Sri Lanka Army.

#### 4.6.1.3 Coefficient

Table 4.9: *Coefficients*

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.0968	.389		2.485	.015
	Professional Qualification	.337	.091	.232	3.405	.001
	Information Communication Technology	.340	.093	.262	3.674	.000
	Contract Management	.266	.067	.277	3.973	.000
	Procurement Planning Process	.530	.076	.507	6.953	.000

a. Dependent Variable: Efficiency Public Procurement

(Source: Survey Data, 2024 analysis using SPSS)

The study conducted a multiple regression analysis to determine the relationship between independent variables and dependent variable. The regression equation was,

$$Y = \beta_0 + \beta_1PQF + \beta_2 ICT + \beta_3 CM+ \beta_4 PPF+ \varepsilon$$

Where  $\beta_0$  is the regression intercept

$\beta_1 - \beta_4$  are the regression coefficients

while Y is the dependent variable (Efficiency of Procurement)

PQF = Professional Qualification Factors

ICT = Information Communication Technology Factors

CM = Contract Management Factors

PPF = Procurement Planning Factors

$\varepsilon$  = Error Term

Table 4.9 presents the regression coefficients for the independent variables to be used in the substitution in the regression model. The results reveal that the regression coefficient for PQ, ICT, CM and PPP was 0.337, 0.340, 0.266, and 0.530 respectively.

This lead to the substitution to the regression model as follows;

$$Y = 0.0968 + 0.337 \text{ PQF} + 0.340 \text{ ICT} + 0.266 \text{ CM} + 0.530 \text{ PPF}$$

The t statistics and p values indicated in Table 4.9 above were used in the hypothesis testing aspects of the study.

#### **4.6.1.4 Testing Hypothesis 1 (H1)**

**H<sub>1</sub>** = There is a significant positive relationship between Professional Qualification of procurement employees and efficiency of public procurement coming under Directorate of Ordnance Services.

The results in Table 4.9 revealed that the computed t statistic was 3.405 and p value of 0.001 which below the 0.05 level of significance leading to a conclusion to accept the hypothesis.

#### **4.6.1.5 Testing Hypothesis 2 (H2)**

**H<sub>2</sub>** = There is a significant positive relationship between Information Communication Technology and efficiency of public procurement coming under Directorate of Ordnance Services.

The results in Table 4.9 revealed that the computed t statistic was 3.674 and p value of 0.000 which was below the 0.05 level of significance leading to a conclusion to accept hypothesis.

#### **4.6.1.6 Testing Hypothesis 3 (H3)**

**H<sub>3</sub>** = There is a significant positive relationship between Contract Management and efficiency of public procurement coming under Directorate of Ordnance Services.

The results in Table 4.9 revealed that the computed t statistic was 3.973 and p value of 0.000 which was below the 0.05 level of significance leading to a conclusion to accept hypothesis.

#### **4.6.1.7 Testing Hypothesis 4 (H4)**

**H<sub>4</sub>** = There is a significant positive relationship between Procurement Planning Process and efficiency of public procurement coming under Directorate of Ordnance Services.

The results in Table 4.9 revealed that the computed t statistic was 6.953 and p value of 0.000 which was below the 0.05 level of significance leading to a conclusion to accept hypothesis.

### **4.7 Summary of Hypothesis Testing**

$$\text{Efficiency of Procurement} = 0.0968 + 0.337 \times \text{PQ} + 0.340 \times \text{ICT} + 0.266 \times \text{CM} + 0.530 \times \text{PPP} + \varepsilon$$

The above equation shows that value of intercept  $\beta_0$  is 0.0968, this value represents that if the values of all dependent variables are zero then value of Efficiency of Procurement would be 0.0968.

The value of  $\beta_1 = 0.337$  which reveals that if Professional Qualification changes by 1%, there would be 33.7% change in Efficiency of Procurement, by holding the other variables constant.

The value of  $\beta_2 = 0.340$  this shows that if Information Communication Technology changes by 1%, there would be 34.0% change in Efficiency of Procurement, by holding the other variables constant.

The value of  $\beta_3 = 0.266$  which reveals that if Contract Management changes by 1%, there would be 26.6% change in Efficiency of Procurement, by holding the other variables constant.

The value of  $\beta_4 = 0.530$  this shows that if Procurement Planning Process changes by 1%, there would be 53.0% change in in Efficiency of Procurement decision, by holding the other variables constant.

From above regression equation it is very clear that Procurement Planning Process has highest impact on Efficiency of Procurement, because it indicates the highest change of 53.0% by comparing with the other variables values in the equation.

By referring to the results indicated in Table 4.9 above, correlation is significant at the 0.05 level ( $P < 0.05$ ) for the all independent variables. Therefore, it can be concluded that all the variables are significant in determining efficiency of procurement process.

Therefore, it can be concluded that professional qualification, information communication technology, contract management, procurement planning have positive significant impact on efficiency of public procurement of Directorate of Ordnance Services of Sri Lanka Army while procurement planning process contribute a lot. Hence, it can assume that if the Directorate of Ordnance Services needs to achieve the efficiency on their procurement process these findings can be accepted.

## **4.8 Relates the Findings to the Theories**

### **4.8.1 Linking Findings to Institutional Theory**

The findings of study show that public procurement processes are heavily influenced by external pressures such as regulations, social norms, and cultural-cognitive elements. This aligns with Institutional Theory, which suggests that organizations conform to these external pressures to gain legitimacy and reduce uncertainty. Further study might reveal that in the context of developing country like Sri Lankan, these external pressures also include unique challenges like political instability, limited resources, which are not fully addressed in traditional Institutional Theory. This could suggest the need for an expanded understanding of the regulatory and cultural-cognitive pillars in these contexts.

**Practical Implications:** The importance of adhering to institutional pressures to ensure compliance and public trust is emphasized. However, too much rigidity in rules can reduce efficiency, indicating a need for more flexible regulatory frameworks.

#### **4.8.2 Relating Findings to Public Value Theory**

The findings likely support the concept that public procurement should aim to create value for society by emphasizing transparency, accountability, and responsiveness. This aligns with Public Value Theory, which focuses on maximizing societal benefits through public sector activities. Further study might expand on Public Value Theory by showing that in specific organization, public value is often compromised due to inefficiencies in procurement processes, such as corruption or lack of capacity. This indicates a gap between the theoretical ideals of public value and the practical realities.

**Practical Implications:** The findings support the importance of developing procurement strategies that align with public value creation, suggesting that policies should be tailor-made to enhance transparency and accountability, especially in areas prone to inefficiency and corruption.

#### **4.8.3 Connecting Findings to Transaction Costs Theory**

The study's results may confirm that transaction costs such as those associated with negotiating, monitoring, and enforcing contracts play a critical role in determining the efficiency of procurement processes. This supports Transaction Costs Theory, which suggests that minimizing these costs is crucial for improving procurement efficiency.

The findings could suggest that transaction costs are sensitive by additional factors like poor infrastructure, lack of technological integration, or inefficient administrations. This expansion points to the need for Transaction Costs Theory to consider these contextual elements when applied to procurement in developing country like Sri Lanka.

**Practical Implications:** The study emphasizes the importance of reducing transaction costs through improved contract management and better integration of ICT in procurement processes. This would align with efforts to enhance efficiency and reduce waste in public procurement.

## **4.9 Chapter Summary**

This chapter includes data presentation and analyses including the preparation of the sample, data entering, editing, coding, behavior of the democratic variables, reliability checking, validity checking, multi collinearity, regression analysis for hypothesis testing of the study.

The hypothesis testing was conducted to test the main four hypotheses of the study and to achieve the main objective of the study. Personal information of the sample was presented by using tables to present frequencies, pie charts and bar charts with percentages to present results graphically.

Through the process of empirical data analysis and presentation, it was mainly discovered that professional qualification, information communication technology, contract management, procurement planning have positive significant relationship with the efficiency of public procurement of Directorate of Ordnance Services of Sri Lanka Army while procurement planning process have strong positive significant relationship with efficiency of public procurement.

# **CHAPATER V**

## **CONCLUSION & RECOMMENDATION**

### **5.1 Summery of the Study**

The main objective of this study was to establish the factors affecting the efficiency of public procurement system functioning under Directorate of Ordnance Services of Sri Lanka Army and introduce possible approaches to overcome the barriers and loopholes in the process. There was limited amount of literature available on efficiency of public procurement in the Sri Lankan context. Therefore, in the present study consider the main four factors as professional qualification, information communication technology, contract management, procurement planning process. Under professional qualification factors explore the variable namely professional qualification, professional development, knowledge of procurement, experience of procurement to identify the impact on the efficiency of public procurement. It was to study the impact of use of information communication technology tools in procurement, information communication technology integration in procurement, use of e-procurement, automation of procurement activities under information communication technology. Under the contract management factors consider the effective contract management, systematic monitoring of contract, effectively resolve disputes and renewal and closure of contract price changes while studying the planning aligns with organization strategic goals, doing adequate marketing analysis on planning, identifying and mitigating risk associated with procurement under procurement planning process.

The study found positive significant influence of professional qualification, information communication technology, contract management, procurement planning process factors on efficiency of public procurement system functioning under Directorate of Ordnance Services. Whereas, procurement planning process exhibit a strong positive significant on efficiency of public procurement. This describes that need to consider on these factors mainly on to achieve the efficiency on the procurement process of Directorate of Ordnance Services of Sri Lanka Army.

This research used the quantitative approach as research strategy which follow the positivism research paradigm. It is based on deductive research approach and survey method is used for this study to collect the data. A self-completion questionnaire was used to collect the data which allows to respondents to answer questions by completing the questionnaire themselves. This method is chosen for some reasons. The reason are as the research questions are defined clearly, questionnaire is the best choice to have standardized data, which is easily to process and analyze.

The research has the constraint of based on the 98 respondents out of 108 Army officers of selected purposive sample. The purposive sampling method was chosen to specifically include officers directly involved in procurement activities within the Directorate of Ordnance Services. This approach ensures that the study focuses on participants with relevant knowledge, expertise and experience in this particular area. Including officers from other procurement sectors, such as engineering services or ration supply of Sri Lanka Army would be less relevant and would not contribute specific insights related to the Directorate of Ordnance Services.

By examining the 90.7% response rate, which is considered a high response rate. The high response rate improves the sample's representativeness and lowers any biases caused by non-responders. Furthermore, the large number of responses (98 relatives to the entire sample of 108) reduces nonresponse bias. As a result, the findings are more likely to correctly reflect the population's attitudes and behaviors.

The potential for sample bias in this study arises from the purposive sampling method used, which targeted officers directly involved in procurement activities within the Directorate of Ordnance Services. This approach might exclude perspectives from other officers who engage in different types of procurement activities, such as engineering services, ration supply, or service-related procurements like air ticketing and transport. As a result, the findings may be biased towards the specific practices and challenges within the Directorate of Ordnance Services, limiting the generalizability of the results to broader procurement contexts within the Sri Lanka Army. Additionally, since purposive sampling is subjective, there is a risk that the selected sample may not fully represent the diversity of views and experiences within the Sri Lanka Army. Because of this, the research findings may not be entirely applicable to other procurement units of Sri Lanka Army, such engineering services, ration supplies, or service-related procurements. The focus on a particular subset of procurement activities means the findings might not take into account more general procurement issues that could be prevalent in other areas of the Army. Additionally, because the sample was chosen based on expertise in a particular procurement area, the findings might overemphasize the significance of specialized knowledge and practices that are less relevant in other procurement domains. Other procurement units may also face different challenges or adhere to different practices that are not captured in the study.

By considering to the risk associated with the purposive sampling method, the actions were taken to mitigate this risk by carefully selecting to include officers with direct involvement in procurement activities specific to the Directorate of Ordnance Services. This targeted selection was justified by the need to gather insights from those with relevant expertise and knowledge, ensuring that the data collected is highly relevant to the research objectives. And to enhance the diversity within the purposive sample, efforts were made to include officers holding different roles within the Army like the appointment holders of procurement committee, technical evaluation committee, procurement progress reviewing committee members, various kind of staff appointments holders from the appointments of staff officers to director appointments. Further actions were taken to select the officers from various professional of procurement staff, accounting and finance professionals, ICT professionals and auditors who directly involving with the procurement activities of the Directorate of Ordnance Services. Furthermore, the sample is representing officers with the various service period capabilities. This helps to capture a broader range of experiences and perspectives, reducing the likelihood of over representing a single viewpoint.

The quantitative data collected through the questionnaire were coded and entered into Statistical Packages for Social Scientists (SPSS). Then, statistical techniques were used for the data to achieve the research objectives, which were included as descriptive statistics of frequency tables, percentages, means, standard deviation and regression analysis to test the hypothesis to identify the factors influence on efficiency of public procurement system functioning under Directorate of Ordnance Services.

## **5.2 Summery of Findings**

### **5.2.1 Professional Qualification and Efficiency of Procurement Process**

The study findings reveal that professional qualification of procurement staff significantly affect the efficiency of public procurement process of Directorate of Ordnance Services in Sri Lanka Army.

### **5.2.2 Information Communication Technology and Efficiency of Procurement Process**

The study found that use of information communication technology in the process of procurement will lead to achieve the high efficiency on the procurement process. The highly information communication technology integrated procurement process is the key to achieve the efficiency than the manual procurement process.

### **5.2.3 Contract Management and Efficiency of Procurement Process**

The study found that proper contract management in procurement process of Directorate of Ordnance Services helps to achieve high efficiency in the procurement process.

### **5.2.4 Procurement Planning Process and Efficiency of Procurement Process**

The study found that poor planning causes inefficiencies in procurement process. With the proper planning aligns with organization strategic goals, doing adequate market analysis before the planning process and identifying and mitigating risk associated with procurement process will lead to achieve the efficiency on the procurement process and able to attain on the targets of the organization by achieving the desired objectives of procurement process.

## **5.3 Conclusion**

The study aimed to identify the factors influencing the efficiency of the public procurement process within the Directorate of Ordnance Services of the Sri Lanka Army. The research was driven by the central question: "What are the factors affecting the efficiency of public procurement functioning under the Directorate of Ordnance Services of Sri Lanka Army?" This question was explored through sub-questions focusing on professional qualifications, information communication technology, contract management, and procurement planning.

The findings revealed that all four factors of professional qualifications, information communication technology, contract management, and procurement planning are significantly impact the efficiency of the public procurement process. The professional qualifications of procurement staff were found to be crucial, as their expertise and experience directly enhance the efficiency of procurement activities. information communication technology integration in the procurement process emerged as another key factor, with the study highlighting that a highly integrated

information communication technology system significantly improves procurement efficiency compared to manual processes.

Contract management was also identified as a vital component, with proper management practices contributing to higher efficiency in the procurement process. Effective contract management, including systematic monitoring and timely dispute resolution, ensures that procurement activities are completed on time and within budget.

Finally, the procurement planning process was found to have the strongest positive influence on procurement efficiency. The study demonstrated that poor planning leads to inefficiencies, while proper planning, aligned with organizational strategic goals and supported by adequate market analysis and risk mitigation, is essential for achieving the desired objectives in the procurement process.

In conclusion, the study suggests that the efficiency of the public procurement process within the Directorate of Ordnance Services can be significantly improved by focusing on enhancing the professional qualifications of procurement staff, integrating advanced information communication technology tools, practicing effective contract management, and ensuring thorough and strategic procurement planning. Addressing these factors will not only improve the efficiency of procurement activities but also contribute to better utilization of government funds within the Sri Lanka Army.

#### **5.4 Recommendations**

The study recommends that procurement staff of Directorate of Ordnance Services should possess sets of skills and professional qualifications appropriate in their procurement activities. And need to do the investments on capacity building of the procurement staff by identifying the relevant area of knowledge need to be further developed. Further Sri Lanka Army need to ensure that suitable soldiers are replaced on the annual replacement process and employed them on the basis of merit and placed in their relevant qualifications, skills, and experience.

Sri Lanka Army needs to take accelerating actions on investing to implementing and establish the information communication technology to streamline the procurement process. Further in line with the government needs to take every effort to apply the information communication technology related improvements in the procurement

activities and acquiring the required computer hardware requirements in order to establish the information communication technology related environment in the field of procurement.

Need to implement the systematic and continues monitoring process on the procurement contracts. Further needs to assess the risk associated with procurement activities and should take the prompt remedial actions on the risks identified. It is better to implement and establish the procurement monitoring cell and the directly report to the Commander of the Army with the purpose of eliminate the influences on the activities.

In the phases of procurement planning needs to identify the risk associated with procurement activities and take the actions to mitigate the risk. Further need to ensure the timely availability of goods and services of the procurement process in order to achieve the requirements of Sri Lanka Army. Continues monitoring of the procurement planning is very important and priorities of the requirements to be evaluated in time to time as per the changers in dynamic environment.

## **5.5 Future Research Directions**

Although the variables included in the research have been studied by many researchers in the past, however it still needs further work due to the controversy of the results as many studies conclude with totally opposite results. It is suggested for future studies to take in consideration on carried out to determine other factors which are not included in this study that affect procurement efficiency in the Directorate of Ordnance Services of Sri Lanka Army. Furthermore, it is recommended to take in consideration of the impact of digital transformation and artificial intelligence on the efficiency of procurement process of Sri Lanka Army the area of how sustainable procurement practices affect to the efficiency of the procurement process.

\*\*\*\*\*

## **REFERENCES**

- Akumuntu, J.(2019). A Study of Efficiency and Effectiveness of Procurement Processes and Performance. *International Journal of Research in Management, Economics and Commerce*, Vol. 9(5). (pp. 1-9)
- Ali, A., Audi, M. Nisar, S., & Senturk, I. (2021). Determinants of Public Procurement Efficiency: A Comprehensive Study of Public Procurement Rules of Punjab, Pakistan.
- Amayi, F. K. & Ngugi, G. K. (2013). Determinants of public procurement performance in Kenya: Case Ministry of Environment, Water and Natural Resources. *International Journal of Social Sciences and Entrepreneurship*, Vol. 1 (5). (pp. 647-667).
- Annual Report. (2017). Ministry of Finance
- Ari Lanka Army. (2022). Annual Performance Report.
- Basheka, B. (2009). Procurement Planning and Local Governance in Uganda: A Factor Analysis Approach. *International Journal of Procurement Management*.
- Bell, E., Bryman, A. (2007). The Ethics of Management Research: An Exploratory Content Analysis. *British Journal of Management*, Vol. 18 (pp. 63-77).
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., Walker, K.(2020). Purposive Sampling: Complex or Simple, Vol. 25(8). (pp. 652-661)
- Chepkesis, K.M., Keitany, P. (2018). Effect of Procurement Planning on Suppliers Performance in Public Institutions: A Case of MOI University. *European Journal of Logistics, Purchasing and Supply Chain Management*, Vol 6 (2). (pp. 1-9).
- Cheptora, N. C., Osoro, A., & Musau, E. G. (2018). The Impact of Information and Communication Technology on Procurement Performance in Manufacturing Firms in Kenya. *International Journal of Academic Research in Business and Social Sciences*, Vol. 8(9). (pp.605–616).
- Duah, G.P., Asiamah, A.K. & Emmanuel, A. (2015). The Effect of Information and Communication Technology on Procurement Enhancement, A Case Study f Komfo Anokye Teaching Hospital – Kumasi. *European Journal of Business and Management*, Vol.7.
- Gatari, C.N., Shale, N.I., & Osoro, A.(2022). Procurement Contract Management and Sustainable Performance of State Corporations in Kenya, *International Journal of Supply Chain and Logistics*, Vol. 6(2) (pp 25 - 37)
- GEYSKENS, Inge; STEENKAMP, Jan-Benedict E. M.; and KUMAR, Nirmalya. Make, buy, or ally: A transaction cost theory meta-analysis. (2006). *Academy of Management Journal*, Vol. 49(3), (pp. 519-543).
- Glasow, P.A. (2005). Fundamentals of Survey Reserch Methodology.
- Grega, M., Orviska, M., Nemeč, J., & Lawson, C. (2019). Factors Determining the Efficiency of Slovak Public Procurement. *The Nispacee Journal of Public Administration and Policy*, Vol. 12(1).

- Hassan, A.J., & Omwenga, J.Q. (2023). Contract Management and Procurement Performance of State Corporation in Kenya. *International Journal of Social Science and Humanities Research*, Vol. 1(1). (pp. 30-48).
- Ismail, W. N. W., Isa, S. S. M., & Yusop, N. (2018). Ideal Construction Procurement System based on Transaction Cost Approach. *International Journal of Academic Research in Business and Social Sciences*, Vol. 8(1),(pp. 807-814).
- Kakwezi, P., & Nyeko, S. (2019). Procurement Process and Performance: Efficiency and Effectiveness of the Procurement Function Patrick Kakwezi, Sonny Nyeko, *International Journal of Social Sciences Management and Entrepreneurship*, Vol. 3(1). (pp. 172-182).
- Kepha, O., Mukulu, E., Gichuhi., Waititu, A. (2014). The Influence of Recruitment and Selection on the Performance of Employees in Research Institutes in Kenya. *International Journal of Science and Research*.
- Kiage, J.O. (2013). Factors Affecting Procurement Performance: A Case of Ministry of Energy. *International Journal of Business and Commerce*, Vol. 3(1). (pp. 54-70).
- Lahdenpera, P.(2013). Determining the ‘Most Economically Advantageous Tender’ Based on Capability and Fee-Percentage Criteria. *Journal of Public Procurement*. Vol 13(4), (Pp.409-446).
- Mabhodha, S. & Choga, F. (2021). The Impact of Information Communication Technology (ICT) on Procurement Process: Case of Zimbabwean Urban Councils, *Open Journal for Information Technology*. (pp. 25-34).
- Marigat, E.K.(2018).Determinants of Effective Procurement Contract Administration in Public Secondary Schools in Mogotio Sub-County, Kenya. *Jomo Kenyatta University of Agriculture and Technology*.
- Masom, C.H., Perreault, W.D. (1991). Collinearity, Power and Interpretation of Multiple Regression Analysis. *Journal of Marketing Research*, Vol. 28(3). (pp. 268-280).
- Ministry of Finance, Sri Lanka. (2023). Budget Estimates.
- Moore, M.H. (2014). *Public Administration Review*, Vol. 74(4), (pp. 46-477).
- Muriuki. J.I., Guyo, W. Kinoti, J., & Odhiambo, R. (2021). Effect of Information and Communication Technology on Procurement Performance in Energy Sector State Corporations in Kenya. *Jomo Kenyatta University of Agriculture and Technology*.
- Ndungu, N., Were, S., & Mwangangi, P. (2020) Influence of Procurement Expertise on Procurement Regulatory Compliance Level in Public Universities in Kenya, *International Journal of Supply Chain Management*, Vol. 5(2). (pp. 21-53).
- Nemec, J., Kubak, M., Donin, G., Kotherova, Z. (2021). Efficiency of Public Procurement in the Czech and Slovak Health Care Sectors. *Transylvanian Review of Administrative Sciences*, (pp. 115-133)
- Njiraini, P.,& Moyi, E.(2006). Supporting MSEs to Access Public Procurement Market in Kenya. *Kenya Institute for Public Policy Research and Analysis*.

Nzau, A. & Njeru, A. (2014). Factors affecting procurement performance of public universities in Nairobi County. *International Academic Journal of Information Sciences and Project Management*, 1 (3), 147-156

Odiaka, O., Schaefer, T. & Roman, J. (2022). Strategies for Strengthening Leader-follower Relationships for Improving Organizational Performance. *African Journal of Business Management*. Vol. 16(11). (pp. 224-238).

Okinyi, T.O. & Muturi, W. (2016). Factors Affecting Efficiency of Procurement in Public Institutions: A Case of Public Entities in Homabay County. *International Journal of Social Sciences and Information Technology*. Vol. 2(2).

Oluka, P. N. & Basheka, B.C. (2014). Determinants and Constraints to Effective Procurement Contract Management in Uganda: A Practitioner's Perspective. *International Journal Logistics Systems and Management*, Vol 17(1). (pp. 104-124).

Peters, R.N., Stewart, S.L.& Weese, S.F. (2019). Contract Management Maturity Model Assessment of the Air Force Nuclear Weapons Center. Naval Postgraduate School Monterey.

Peterson, R.A.(2000). A Meta-Analysis of Variance Accounted for and Factor Loadings in Exploratory Factor Analysis. *Kluwer Academic Publishers, Manufactured in The Netherlands*. (pp. 261-275)

Procurement Guideline (Goods and Works). (2006). Democratic Socialist Republic of Sri Lanka.

Procurement Manual (Goods and Works). (2006). Democratic Socialist Republic of Sri Lanka.

Rajeh, M.A, Tookey, J & Rotimi, J. 2014, 'Best procurement selection: development of a conceptual model based on transaction costs'. *Australasian Journal of Construction Economics and Building Conference Series*, Vol. 2(2), (pp. 56-63)

Rubinfeld, D.L. Reference Manual on Scientific Evidence.

Sarhan, S., Pasquire, C., King, A. & Manu, E. (2018). Institutional Waste within the UK Construction Procurement Context: A Conceptual Framework. *The Engineering Project Organizational Journal*, Vol. 8.

Saunders, M., Lewis, P., Thornhill, A. (2009). *Research Methods for Business Students*. Fifth Edition.

Shiundu, D. & Rotich, G. (2014). Factors influencing efficiency in procurement systems among public institutions: A case of City Council of Nairobi. *International Academic Journals*, Vol.1 (1), 79-96

Sri Lanka Army. (2020). Annual Performance Report.

Sri Lanka Army. (2021). Annual Performance Report.

Thai, K.V., *Advancing Public Procurement: Practices, Innovation and Knowledge Sharing*.

Timothy, A., Brown, & Michael T. Moore. (2013). Confirmatory Factor Analysis, Vol. (pp. 361-379).

Turrell, A. (2014). Developing a Public Value Healthcare Procurement Framework. *Journal of Public Procurement*, Vol. 13(4) (pp. 476-515)

Waigwa, M. W. & Njeru, A. (2016). Factors influencing management of procurement contracts in public security agencies: A case of Kenya Police Service. *International Academic Journal of Procurement and Supply Chain Management*, Vol.2 (2), (pp.20-40)

Wibowo, R. (2019). Impact of Procurement Professionalization on the Efficiency of Public Procurement.

Wibowo, R.(2019). Impact of procurement professionalization on the efficiency of public procurement, Information Technology Division, Besmart Global Indonesia.

## **APPENDIX I**

### **FACTORS AFFECTING EFFICIENCY OF PUBLIC PROCUREMENT FUNCTIONING UNDER DIRECTORATE OF ORDNANCE SERVICES OF SRI LANKA ARMY**

# Questionnaire

The information provided will be treated confidentially and will be used solely for academic purposes. You do not need to provide any identifying information.

## **PART 1**

### 1. Gender

- I. Male
- II. Female
- III. Prefer not to say

### 2. Age

- I. 20 Years – 28 Years
- II. 29 Years – 37 Years
- III. 38 Years – 46 Years
- IV. 47 Years – 55 Years

### 3. Highest Education Qualification

- I. Diploma
- II. Graduate
- III. Post Graduate
- IV. Masters

### 4. Experience

- I. Less than 2 Years
- II. 3 Years – 5 Years
- III. 5 Years – 10 Years
- IV. Greater than 10 Years

### 5. Courses attended relate to procurement.

.....  
.....

## **PART 2**

## Factors Affecting to Efficiency of Public Procurement Process of Directorate of Ordnance Services of Sri Lanka

(Evaluate the degree of your agreement with the impacts of factors on efficiency of procurement process – Where the 1-5 scale use as **Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5**, Please use the tick the box with ‘√’ mark)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Professional Qualification of Procurement Employees</b>					
6. The procurement staff possess the necessary professional qualifications to perform their duties efficiently.					
7. Continuous professional development for procurement staff enhances the efficiency of the procurement process.					
8. The procurement staff possess adequate knowledge of procurement regulations and guidelines.					
9. The professional expertise of procurement staff contributes to timely procurement of goods and services.					
10. The procurement staff are skilled in negotiating with suppliers to obtain the best value for money.					
11. The experience of procurement staff in procurement activities leads to fewer errors and delays in the process.					
<b>Information Communication Technology (ICT)</b>					
12. The use of ICT tools in procurement activities significantly improves the overall efficiency of the					

procurement process.					
13. Electronic procurement systems enhance transparency in the procurement process.					
14. ICT integration in procurement allows for better data management and analysis.					
15. The use of e-procurement reduces the cost of procurement transactions.					
16. ICT enables effective communication and collaboration with suppliers.					
17. The automation of procurement activities through ICT leads to timely procurement and delivery of goods and services.					
<b>Contract Management</b>					
18. Effective contract management practices ensure compliance with procurement regulations and reduce associated risks..					
19. The systematic monitoring of contracts helps in achieving procurement objectives.					
20. Proper contract management reduces the risks associated with procurement activities.					
21. Contract management processes are clearly defined and followed within the organization.					
22. The organization effectively resolves disputes arising from procurement contracts.					
23. The renewal and closure of contracts are managed efficiently to avoid disruptions in procurement.					

<b>Procurement Planning Process</b>					
24. The procurement planning process is aligned with the organization's strategic goals and involves regular review and updates to reflect current needs and conditions.					
25. Adequate market analysis is conducted during the procurement planning phase.					
26. Procurement planning helps in identifying and mitigating risks associated with procurement activities.					
27. The organization follows a well-defined procurement strategy during the planning process.					
28. Procurement plans are reviewed and updated regularly to reflect current needs and conditions.					
29. The procurement planning process ensures the timely availability of goods and services.					
<b>Efficiency of Public Procurement</b>					
30. The procurement process effectively meets the organization's needs for goods and services.					
31. The procurement process minimizes waste and maximizes value for money.					
32. The procurement activities are completed within the planned timeframe.					
33. The procurement process ensures the procurement of high-quality goods and services.					
34. The procurement process is transparent and free from corruption.					
35. The procurement process involves					

fair competition among suppliers.					
-----------------------------------	--	--	--	--	--

Thank You !

**Annex “A”**

**Frequencies Statistics**  
**Test of unusual value, missing values and outliers**

		Gender	Age	Highest Education Qualification	Experience
N	Valid	98	98	98	98
	Missing	0	0	0	0

		The procurement staff have the necessary professional qualifications to perform their duties efficiently.	Continuous professional development for procurement staff enhances the efficiency of the procurement process.	The procurement staff possess adequate knowledge of procurement regulations and guidelines.	The professional expertise of procurement staff contributes to timely procurement of goods and services.	The procurement staff are skilled in negotiating with suppliers to obtain the best value for money.
N	Valid	98	98	98	98	98
	Missing	0	0	0	0	0
Mean		3.65	4.36	3.85	3.86	3.01
Std. Deviation		.996	.707	.889	.760	1.020

		The use of ICT tools in procurement activities improves the overall efficiency of the procurement process.	Electronic procurement systems enhance transparency in the procurement process.	ICT integration in procurement allows for better data management and analysis.	The use of e-procurement reduces the cost of procurement transactions.	ICT enables effective communication and collaboration with suppliers.
N	Valid	98	98	98	98	98

	Missing	0	0	0	0	0
Mean		4.38	4.20	4.26	4.13	3.93
Std. Deviation		.780	.732	.504	.795	.707

		Effective contract management practices ensure compliance with procurement regulations.	The systematic monitoring of contracts helps in achieving procurement objectives.	Proper contract management reduces the risks associated with procurement activities.	Contract management processes are clearly defined and followed within the organization.	The organization effectively resolves disputes arising from procurement contracts.
N	Valid	98	98	98	98	98
	Missing	0	0	0	0	0
Mean		3.68	3.73	3.66	3.39	3.40
Std. Deviation		.832	.926	.849	.755	.756

		The procurement planning process aligns with the organization's strategic goals.	Adequate market analysis is conducted during the procurement planning phase.	Procurement planning helps in identifying and mitigating risks associated with procurement activities.	The organization follows a well-defined procurement strategy during the planning process.	Procurement plans are reviewed and updated regularly to reflect current needs and conditions.
N	Valid	98	98	98	98	98
	Missing	0	0	0	0	0

Mean	3.62	3.49	4.02	3.40	3.48
Std. Deviation	.936	.864	.609	.905	.911

		25. The procurement process effectively meets the organization's needs for goods and services.	26. The procurement process minimizes waste and maximizes value for money.	27. The procurement activities are completed within the planned timeframe.	28. The procurement process ensures the procurement of high-quality goods and services.	29. The procurement process is transparent and free from corruption.
N	Valid	98	98	98	98	98
	Missing	0	0	0	0	0
Mean		3.83	3.51	3.16	3.52	3.10
Std. Deviation		.800	.888	.981	.828	.843

## Annex "B"

### Demographic Information

#### Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	82	83.7	83.7	83.7
	Female	16	16.3	16.3	100.0
	Total	98	100.0	100.0	

### Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	29 Years – 37 Years	46	46.9	46.9	46.9
	38 Years – 46 Years	45	45.9	45.9	92.9
	47 Years – 55 Years	7	7.1	7.1	100.0
	Total	98	100.0	100.0	

### Highest Education Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graduate	54	55.1	55.1	55.1
	Post Graduate	8	8.2	8.2	63.3
	Master	36	36.7	36.7	100.0
	Total	98	100.0	100.0	

### Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 Years – 5 Years	6	6.1	6.1	6.1
	5 Years – 10 Years	24	24.5	24.5	30.6
	Greater than 10 Years	68	69.4	69.4	100.0
	Total	98	100.0	100.0	

**The procurement staff have the necessary professional qualifications to perform their duties efficiently.**

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Strongly disagree	1	1.0	1.0	1.0
	Disagree	15	15.3	15.3	16.3
	Neutral	20	20.4	20.4	36.7
	Agree	43	43.9	43.9	80.6
	Strongly agree	19	19.4	19.4	100.0
	Total	98	100.0	100.0	

**Continuous professional development for procurement staff enhances the efficiency of the procurement process.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	3.1	3.1	3.1
	Neutral	4	4.1	4.1	7.1
	Agree	46	46.9	46.9	54.1
	Strongly agree	45	45.9	45.9	100.0
	Total	98	100.0	100.0	

**The procurement staff possess adequate knowledge of procurement regulations and guidelines.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	1.0	1.0
	Disagree	10	10.2	10.2	11.2
	Neutral	11	11.2	11.2	22.4
	Agree	57	58.2	58.2	80.6
	Strongly agree	19	19.4	19.4	100.0
	Total	98	100.0	100.0	

**The professional expertise of procurement staff contributes to timely procurement of goods and services.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	9	9.2	9.2	9.2
	Neutral	9	9.2	9.2	18.4
	Agree	67	68.4	68.4	86.7
	Strongly agree	13	13.3	13.3	100.0
	Total	98	100.0	100.0	

**The procurement staff are skilled in negotiating with suppliers to obtain the best value for money.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	5.1	5.1	5.1
	Disagree	29	29.6	29.6	34.7
	Neutral	30	30.6	30.6	65.3
	Agree	28	28.6	28.6	93.9
	Strongly agree	6	6.1	6.1	100.0
	Total	98	100.0	100.0	

**The experience of procurement staff in procurement activities leads to fewer errors and delays in the process.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	1.0	1.0
	Disagree	7	7.1	7.1	8.2
	Neutral	11	11.2	11.2	19.4
	Agree	55	56.1	56.1	75.5
	Strongly agree	24	24.5	24.5	100.0

	Total	98	100.0	100.0	
--	-------	----	-------	-------	--

**The use of ICT tools in procurement activities improves the overall efficiency of the procurement process.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	5.1	5.1	5.1
	Neutral	3	3.1	3.1	8.2
	Agree	40	40.8	40.8	49.0
	Strongly agree	50	51.0	51.0	100.0
	Total	98	100.0	100.0	

**Electronic procurement systems enhance transparency in the procurement process.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	1.0	1.0	1.0
	Neutral	15	15.3	15.3	16.3
	Agree	45	45.9	45.9	62.2
	Strongly agree	37	37.8	37.8	100.0
	Total	98	100.0	100.0	

**ICT integration in procurement allows for better data management and analysis.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	3	3.1	3.1	3.1
	Agree	67	68.4	68.4	71.4
	Strongly agree	28	28.6	28.6	100.0
	Total	98	100.0	100.0	

**The use of e-procurement reduces the cost of procurement transactions.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.0	2.0	2.0
	Disagree	2	2.0	2.0	4.1
	Neutral	7	7.1	7.1	11.2
	Agree	57	58.2	58.2	69.4
	Strongly agree	30	30.6	30.6	100.0
	Total	98	100.0	100.0	

**ICT enables effective communication and collaboration with suppliers.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	6.1	6.1	6.1
	Neutral	10	10.2	10.2	16.3
	Agree	67	68.4	68.4	84.7
	Strongly agree	15	15.3	15.3	100.0
	Total	98	100.0	100.0	

**The automation of procurement activities through ICT leads to timely procurement and delivery of goods and services.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	3.1	3.1	3.1
	Neutral	21	21.4	21.4	24.5
	Agree	54	55.1	55.1	79.6
	Strongly agree	20	20.4	20.4	100.0
	Total	98	100.0	100.0	

**Effective contract management practices ensure compliance with procurement regulations.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	12	12.2	12.2	12.2
	Neutral	18	18.4	18.4	30.6
	Agree	57	58.2	58.2	88.8
	Strongly agree	11	11.2	11.2	100.0
	Total	98	100.0	100.0	

**The systematic monitoring of contracts helps in achieving procurement objectives.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	11	11.2	11.2	11.2
	Neutral	25	25.5	25.5	36.7
	Agree	41	41.8	41.8	78.6
	Strongly agree	21	21.4	21.4	100.0
	Total	98	100.0	100.0	

**Proper contract management reduces the risks associated with procurement activities.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	11	11.2	11.2	11.2
	Neutral	24	24.5	24.5	35.7
	Agree	50	51.0	51.0	86.7
	Strongly agree	13	13.3	13.3	100.0
	Total	98	100.0	100.0	

**Contract management processes are clearly defined and followed within the organization.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	12	12.2	12.2	12.2
	Neutral	40	40.8	40.8	53.1
	Agree	42	42.9	42.9	95.9
	Strongly agree	4	4.1	4.1	100.0
	Total	98	100.0	100.0	

**The organization effectively resolves disputes arising from procurement contracts.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	8.2	8.2	8.2
	Neutral	51	52.0	52.0	60.2
	Agree	31	31.6	31.6	91.8
	Strongly agree	8	8.2	8.2	100.0
	Total	98	100.0	100.0	

**The renewal and closure of contracts are managed efficiently to avoid disruptions in procurement.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	8.2	8.2	8.2
	Neutral	44	44.9	44.9	53.1
	Agree	39	39.8	39.8	92.9
	Strongly agree	7	7.1	7.1	100.0
	Total	98	100.0	100.0	

**The procurement planning process aligns with the organization's strategic goals.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	17	17.3	17.3	17.3
	Neutral	17	17.3	17.3	34.7
	Agree	50	51.0	51.0	85.7
	Strongly agree	14	14.3	14.3	100.0
	Total	98	100.0	100.0	

**Adequate market analysis is conducted during the procurement planning phase.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	1.0	1.0
	Disagree	14	14.3	14.3	15.3
	Neutral	26	26.5	26.5	41.8
	Agree	50	51.0	51.0	92.9
	Strongly agree	7	7.1	7.1	100.0
	Total	98	100.0	100.0	

**Procurement planning helps in identifying and mitigating risks associated with procurement activities.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	4.1	4.1	4.1
	Neutral	5	5.1	5.1	9.2
	Agree	74	75.5	75.5	84.7
	Strongly agree	15	15.3	15.3	100.0
	Total	98	100.0	100.0	

**The organization follows a well-defined procurement strategy during the planning process.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	19	19.4	19.4	19.4
	Neutral	30	30.6	30.6	50.0
	Agree	40	40.8	40.8	90.8
	Strongly agree	9	9.2	9.2	100.0
	Total	98	100.0	100.0	

**Procurement plans are reviewed and updated regularly to reflect current needs and conditions.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	1.0	1.0
	Disagree	17	17.3	17.3	18.4
	Neutral	22	22.4	22.4	40.8
	Agree	50	51.0	51.0	91.8
	Strongly agree	8	8.2	8.2	100.0
	Total	98	100.0	100.0	

**The procurement planning process ensures the timely availability of goods and services.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	1.0	1.0
	Disagree	11	11.2	11.2	12.2
	Neutral	17	17.3	17.3	29.6
	Agree	55	56.1	56.1	85.7
	Strongly agree	14	14.3	14.3	100.0
	Total	98	100.0	100.0	

**The procurement process effectively meets the organization's needs for goods and services.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	9	9.2	9.2	9.2
	Neutral	14	14.3	14.3	23.5
	Agree	60	61.2	61.2	84.7
	Strongly agree	15	15.3	15.3	100.0
	Total	98	100.0	100.0	

**The procurement process minimizes waste and maximizes value for money.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.0	2.0	2.0
	Disagree	13	13.3	13.3	15.3
	Neutral	23	23.5	23.5	38.8
	Agree	53	54.1	54.1	92.9
	Strongly agree	7	7.1	7.1	100.0
	Total	98	100.0	100.0	

**The procurement activities are completed within the planned timeframe.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	3.1	3.1	3.1
	Disagree	25	25.5	25.5	28.6
	Neutral	29	29.6	29.6	58.2
	Agree	35	35.7	35.7	93.9
	Strongly agree	6	6.1	6.1	100.0
	Total	98	100.0	100.0	

**The procurement process ensures the procurement of high-quality goods and services.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	16	16.3	16.3	16.3
	Neutral	20	20.4	20.4	36.7
	Agree	57	58.2	58.2	94.9
	Strongly agree	5	5.1	5.1	100.0
	Total	98	100.0	100.0	

**The procurement process is transparent and free from corruption.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.0	2.0	2.0
	Disagree	21	21.4	21.4	23.5
	Neutral	43	43.9	43.9	67.3
	Agree	29	29.6	29.6	96.9
	Strongly agree	3	3.1	3.1	100.0
	Total	98	100.0	100.0	

**The procurement process involves fair competition among suppliers.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	12	12.2	12.2	12.2
	Neutral	24	24.5	24.5	36.7
	Agree	58	59.2	59.2	95.9
	Strongly agree	4	4.1	4.1	100.0
	Total	98	100.0	100.0	

**Reliability Test**

**1. Demographic Information**

**Reliability**

**Scale: ALL VARIABLES**

**Case Processing Summary**

		N	%
Cases	Valid	98	100.0
	Excluded	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.700	6

**2. Professional Qualification of Procurement Employees (Q 6 to Q 11)**

**Reliability**

**Scale: ALL VARIABLES**

**Case Processing Summary**

		N	%
Cases	Valid	98	100.0
	Excluded	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.700	6

**3. Information Communication Technology (ICT) (Q 12 to Q 17)**

**Reliability**

**Scale: ALL VARIABLES**

**Case Processing Summary**

		N	%
Cases	Valid	98	100.0
	Excluded	0	.0
	Total	98	100.0

Excluded	0	.0
Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.781	6

**4. Contract Management (Q 18 to Q 23)**

**Reliability**

Scale: ALL VARIABLES

**Case Processing Summary**

		N	%
Cases	Valid	98	100.0
	Excluded	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.902	6

**5. Procurement Planning Process (Q 24 to Q 29)**

**Reliability**

Scale: ALL VARIABLES

**Case Processing Summary**

		N	%
--	--	---	---

Cases	Valid	98	100.0
	Excluded	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
.807	6

### **6. Efficiency of Public Procurement (Q 30 to Q35)**

#### Reliability

Scale: ALL VARIABLES

#### Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
.845	6

**Annex “D”**

**Multi-Collinearity**

<b>Correlations</b>						
		Professional Qualification	Information Communication Technology	Contract Management	Procurement Planning Process	Efficiency Public Procurement
Professional Qualification	Pearson Correlation	1	.436**	.376**	.488**	.498**
	Sig. (2- tailed)		.000	.000	.000	.000
	N	98	98	98	98	98

Information Communication Technology	Pearson Correlation	.488**	1	.317**	.263**	.497**
	Sig. (2- tailed)	.000		.001	.009	.000
	N	98	98	98	98	98
Contract Management	Pearson Correlation	.376**	.317**	1	.282**	.515**
	Sig. (2- tailed)	.000	.001		.005	.000
	N	98	98	98	98	98
Procurement Planning Process	Pearson Correlation	.436**	.263**	.282**	1	.670**
	Sig. (2- tailed)	.000	.009	.005		.000
	N	98	98	98	98	98
Efficiency Public Procurement	Pearson Correlation	.498**	.497**	.515**	.670**	1
	Sig. (2- tailed)	.000	.000	.000	.000	
	N	98	98	98	98	98
**. Correlation is significant at the 0.01 level (2-tailed).						