The role of procurement quality controls in procurement performance in the energy sector in Zimbabwe

Tinotenda Fredrick Munyimi

Abstract: Procurement performance is a rapidly developing area of research. Many companies are trying to find tools for optimising procurement performance measures in response to turbulent business markets and for efficiently controlling their business activities. No empirical research has been conducted in the role of procurement quality controls in procurement performance of the energy sector. This research intends to make a contribution to existing procurement literature by measuring the role frolicked by procurement quality controls in procurement performance in the energy sector. The major objective was to: establish the role of value engineering, variety reduction, standardisation and specifications in procurement performance. A cross-sectional survey of energy companies was used in this research. This research targeted practising procurement practitioners working in companies in the energy sector. Purposive sampling method was utilised to select energy companies; however, simple random sampling method was utilised to select seventy 70 practising procurement practitioners from the entire population of eighty five 85 practising procurement practitioners of all energy companies in the energy sector.

ABOUT THE AUTHOR

Tinotenda Fredrick Munyimi is a very creative young qualified procurement professional with sharp private sector procurement, third sector procurement and public sector procurement skills, bread apart in negotiation skills. He brings to the Bindura Municipality a wealth of procurement skills and experience having been instrumental in the establishment of the procurement management department in January 2019. He has worked in procurement for various companies, inter-alia, Zimbabwe Electricity Supply Authority (ZESA) – Powertel Communications, Harare, Zimbabwe where he was groomed as procurement professional. He graduated with a Bachelor of Commerce Honours Degree in Purchasing and Supply Management from Bindura University of Science, Bindura, Zimbabwe in October 2018. He has vast procurement experience spanning over two years. He is recognized around the world for his researches in public sector procurement, private sector procurement, third sector procurement, sustainable procurement, strategic procurement, global procurement, legal aspects in procurement and buyer-supplier relationships.

PUBLIC INTEREST STATEMENT

The purpose of the energy sector is generating or supplying energy and embracing companies in the exploration, development and drilling of oil or gas reserves, refining or integrated power utility companies comprising renewable energy and coal. Despite having practising as a procurer in Zimbabwe for over two years and recognising diligently with procurement quality controls approaches, recognising their role in procurement performance has made me cognisant of my own deficit intellectual. Thus in public interest, this research accentuates the role of procurement quality controls in procurement performance. The results suggest that value engineering or value analysis, variety reduction, standardisation and specifications are positive and significant prognosticators of procurement performance. This research is useful for procurement directors, procurement managers, procurement officers, buyers, procurement clerks and procurement policy makers like the Procurement Regulatory Authority of Zimbabwe (PRAZ) who can further enhance the procurement performance of procurement management departments.
companies. This research is based on closed-ended questions to procurement managers, procurement officers, buyers, procurement clerks and open-ended interviews for procurement managers only. The data were described and analysed through the use of Statistical Package for Social Sciences (SPSS) software (Version 20), and the findings were presented in tables. Analysis for variance (ANOVA) and regression analysis were utilised to test the hypothesis. The procurement quality controls clustered into four categories: value engineering, variety reduction, standardisation and specifications were found to have a positive significant correlation in procurement performance. This research finding recommends that practicing procurement practitioners in the energy sector should move towards these procurement quality controls to upsurge procurement performance in order to reinforce its position at the board of directors. Further, important concerns such as why quality consciousness in procurement, creating corporate advantage through procurement quality controls and understanding the effect of procurement quality controls in the correlation between procurement performance and firm performance are some of the other areas worth researching in the future.

**Subjects: Economics; Finance; Business, Management and Accounting**

**Keywords: procurement quality controls; procurement performance; energy**

1. **Introduction**

Procurement practices have advanced significantly over the last decade. The implementation of quality management by companies is one of the latest steps towards improving the whole performance of the company. It has become a strategic professional function that progressively identifies the prominence of procurement quality controls, which can be regarded as the mirror image of procurement performance. This research seeks to evaluate the role of procurement quality controls in procurement performance.

In order to endure in this tempestuous business environment, the companies must persistently monitor their competitive position as well as their procurement process. Procurement quality controls have become essential basics in the economic strategies of companies confronted with the challenge of cutting their procurement costs and upsurging efficiency without compromising quality and customer service (Chartered Institute of Purchasing & Supply, 2017). Procurement quality controls are expected to enhance the performance of procurement, particularly in terms of procurement outcomes.

The concept of procurement quality control emerged out of the industrial revolution (Munyimi & Chari, 2018). Procurement quality controls are one of the key requirements of today’s going concerns. In order to upsurge competitiveness from a price and time-to-market viewpoint, numerous companies initiate procurement quality controls to reduce their product complexity to generate much customer value.

Procurement performance has remained a burning issue for eras and it still is. As with some other professions like accounting and marketing, the procurement profession seeks to upsurge its responsibility in order to fortify its place at the board of directors. Procurers seek to identify tools to measure procurement performance and link it to business plan (Van Weele, 2017).

Procurement performance has received more courtesy over the past era. Uniqueness of the motives for this is that more and more companies are recognising the value-added competences of the procurement function (Lysons & Farrington, 2017). Procurement performance is achieved when goods or services are procured at the best possible cost to meet the needs of the purchaser in terms of quality, quantity, time and location.
While previous literature documented the robust relationship between procurement management and companies’ performance, for instance, Evans (2004) and Bourne, Mills, Wilcox, and Neely (2000), research on procurement quality controls in procurement performance antecedents has been overlooked. It is essential for today’s procurement directors and procurement managers to understand the influence of procurement quality controls on the performance and success of their companies.

To the best of the researcher’s knowledge, this research is the first endeavour to test the role of procurement quality controls in procurement performance in multiple linear regression model empirically. Previous known studies focused on the measurement of procurement performance and other independent variables such as buyer-supplier relationships, strategic sourcing and supplier development (Lardenoije, Van Raaij, & Van Weele, 2005; Trent & Monczka, 1998), the majority of these are based on case study research, but no research has been conducted to show the relationship between procurement quality controls and procurement performance.

The impact of procurement quality controls in the procurement departments is driven by the contribution of the function to overall company performance and its interface relationships. Much has been written about procurement quality controls, but the actual role of procurement quality controls in procurement performance has not been empirically substantiated or rigorously researched (Munyimi & Chari, 2018).

Using existing procurement literature to establish the conceptual foundation, this research intends to fill the gap in the existing procurement literature with respect to the role of procurement quality controls in procurement performance. Hence, the objective of this research is to assess the role of procurement quality controls in procurement performance in the energy sector.

This research consists of four sections. The next section provides a conceptual synopsis of this research and empirical underpinning. Section 3 focuses on the methodological issues pertinent to this research. Section 4 reports the results of the statistical analyses, tests of the hypotheses and discussion of the findings of this research. This research ends with conclusions, along with recommendations and direction for future research.

2. Literature underpinning
This section presents conceptual and empirical underpinning on procurement quality controls and procurement performance in order to provide a basis for this research.

3. The concept of procurement quality controls
According to Munyimi and Chari (2018), procurement quality is the totality of features and characteristics of a product that bears on the ability to satisfy stated needs. Procurement quality can be achieved through the following controls: value engineering, variety reduction, standardisation and specifications. We are looking at the whole procurement process holistically.

4. Value engineering
Value engineering is a systematic method to improve the value of goods or products and services by using an examination of function (Gou, Liu, & Li, 2011). It is a technique used by procurers in which the value of systems output is optimised by crafting a mix of performance and costs. This procurement quality control practice identifies and removes unnecessary expenditures, thereby increasing the value for the manufacturer and/or their customers.

5. Variety reduction
According to Leenders, Fearon, Flynn, & Johnson (2002), variety reduction is a procurement quality control process of reducing the number of types, size or grades of goods that are purchased. The procurement quality control ensures on quality as its hallmark. This process is used by procurement practitioners to standardise and simplify different items that are capable of performing the
same function. Variety reduction helps procurement practitioners to reduce the number of varieties procured and to stipulate suitability of purpose.

6. Standardisation
Standardisation is the process used by procurement practitioners to implement and develop technical standards based on the consensus of the company, end users and procurers (Lucassen, 2013). Standardisation differs from specification in that while every standard is a specification, not every specification is a standard. Standard may be distinguished according to subject matter, purpose and range of application.

7. Specifications
According to Akhtar (2010), specifications are exact statements used by procurement practitioners of the particular needs to be satisfied or essential characteristics that a user requires in a good or service and which a supplier must deliver. They are required by procurers in the purchase requisitions raised by users, they are part of the procurement contract documentation, and play a key role in the procurement process.

8. The concept of procurement performance
Lysons & Farrington (2017) viewed procurement performance as consisting of (but not limited to) financial performance, return on investment, enhanced profitability, quality improvements, competitive advantage, cost reduction, customer satisfaction and social responsibility. Thus, it influences the added value of the purchase.

9. Conceptual underpinning
Conceptual underpinning is a chromatic or written illustration that elucidates graphically or in narrative form the main things (variables) to be researched (Kothari, 2016). The independent variables were value engineering, variety reduction, standardisation and specifications whereas dependent variable will be procurement performance as conceptualised in Figure 1.

10. Empirical underpinning
The research conducted by Blair, Williams & Lin (2016) generalised the role of standardisation, certification and assurance services in global commerce without paying particular attention to their effects in the energy industry. They argued, in their empirical study, that a positive contributor to globalisation in recent years has been the rapid development of standards for business processes as well as products. This research proposes to go beyond Blair et al. (2016)’s work in finding the role of standardisation in procurement performance. Anisimova (2015) discovered that specifications such as performance specifications, brand or trade name specifications and sample specifications positively improved quality management in procurement about the analyses of quality management systems in purchasing. The investigator Anisimova (2015) added quality management systems to our knowledge. This research seeks to go beyond by investigating the role of specifications in procurement performance. Empirical study by Haug, Hvam, and Mortensen (2016) recommended variety reduction in product solution spaces of engineer-to-order companies in Novenco in Denmark. Variety reduction increases competitiveness from a price and time-to-market perspective, it positively reduced internal product complexity by eliminating the product variety that did not create customer value. However, their study did not focus on the role of variety reduction in procurement performance which this research will target. The scholarly work by Carstea, Paun, and Paun (2016) in a study of quality management in procurement and management of material resources in Romania, recommended that procurement departments should standardise the materials procured by the company so as to turn the process of procurement and management of material resources as a source for quality improvement, given that it has a decisive role in quality assurance. This study proposes to go beyond by showing how standardisation contributes to procurement performance. Siongok and Noor (2016) investigated the role of quality control system on procurement performance in Kenyan national highways authority. The researchers found that value engineering plays a pivotal positive role in enhancing procurement performance of state corporations in Kenya. They recommended that implementation of value engineering should support the Corporation’s business
strategy. This research goes beyond since the findings of their study were only limited to the national highway authority in Kenya and did not study the views of the other companies, so it may reflect some partial view. Sa’nchez-Rodríguez, Hemsworth, Martínez-Lorente, & Clavel (2006) discovered that standardisation in purchasing has a significant positive effect on business performance about an empirical study on the impact of standardisation of materials and purchasing procedures on business performance. The investigators Sa’nchez-Rodríguez et al. (2006) added the standardising materials and purchasing procedures that may help firms to meet their materials expenditure targets, and increase the quality of materials, on-time delivery from suppliers, as well as business performance to our knowledge. This research proposes to go beyond in establishing the role of standardisation in procurement performance.

This research therefore focused on the following hypothesis:

- **Hypothesis**: Procurement quality controls have an influence in procurement performance of energy companies in Zimbabwe at \( \alpha < 0.05 \) significance level.

### 11. Methodology

To gain insight into the role of procurement quality controls in procurement performance in the energy sector, the mixed method approach which employs both qualitative and quantitative research methods in the form of descriptive cross-sectional survey of energy companies was applied. This research targeted procurement managers, procurement officers, buyers and procurement clerks working in companies in the energy sector, by the regulator Zimbabwe Energy Regulatory Authority (ZERA) reports as in December 2018. Purposive sampling method was utilised to select energy companies. However, simple random sampling method was utilised to select seventy (70) practicing procurement practitioners from the entire population of eighty five (85) procurement practitioners holding the positions of procurement manager, procurement officer, buyer and procurement clerk of all energy companies using Krejcie & Morgan (1970) formula:
\( S = X^2NP(1-P)/d^2(N-1) + X^2P(1-P) \)

where \( S \) = required sample size;

\( X^2 \) = the table value of chi-square for 1 degree of freedom at the desired confidence level.

\( N \) = the population size.

\( P \) = the population proportion.

\( d \) = the degree of accuracy expressed as a proportion.

Primary data were collected by closed-ended questionnaires and open-ended interviews to inquire for further specifics. Open-ended interviews were conducted between 50 and 60 min with procurement managers responsible for the procurement of each energy company. Pilot tests were performed to enable the researcher to remove errors before the actual collection of primary data begins. This research instrument was given to expert researchers in the procurement field and 1% of the sample was measured for pilot study that is seven procurement managers in the energy sector (Munyimi & Chari, 2018). To ensure validity and reliability of this research instrument, Cronbach’s alpha coefficient was used and was benchmarked at a cut off value of \( \geq 0.70 \) (Gujarati, 2017). Descriptive statistics by use of Statistical Package for Social Science (SPSS) software (version20) was utilised to analyse primary data collected using closed-ended questionnaires. The findings on primary data were presented in tables. Multiple linear regression was run to assess the role of the variables which are set out in the conceptual underpinning of this research. The multiple linear regression model specified to investigate the effect of procurement quality controls in procurement performance is presented below:

**Multilinear Regression Analysis Model**

\[ P = \beta_0 + \beta_1(C_1) + \beta_2(C_2) + \beta_3(C_3) + \beta_4(C_4) + \xi \]

Where: \( P \) = procurement performance (dependent variable); \( \beta_0 \) = the intercept term (constant); \( \xi \) = error term; \( \beta_1 \) to \( \beta_4 \) = multiple linear regression coefficients for the following independent variables, respectively;

\( C_1 \) = value engineering; \( C_2 \) = variety reduction; \( C_3 \) = standardisation; \( C_4 \) = specifications.

Multiple linear regression colinearity statistics checks shall be performed using coefficient of multiple determination (\( R^2 \)), adjusted \( R^2 \) and the F-statistic. This will enable the multiple linear regression model estimated to be evaluated before the model can be used for forecasting purposes (Gujarati, 2017).

**12. Results and discussions**

This section presents, interprets and discusses the research findings on the investigation to establish the relationship between procurement quality controls and procurement performance in the energy sector.

**13. General information**

This section presents the statistical data relating to the practicing procurement practitioners in the energy sector. A table on profile of practicing procurement practitioners is shown in Table 1.

From this research, most of the respondents are practising as buyers in energy companies (44.3%); while the remaining (55.7%) held varying procurement positions such as procurement managers, procurement officers and procurement clerks as indicated in Table 1. The respondents have a high level of education since most of the respondents are diploma holders with
a percentage of 37.1%. Generally, in procurement, it is only recent that universities in Zimbabwe are offering degrees in procurement, for a very long time Zimbabwe had been relying on polytechnic colleges which offer diplomas in procurement. From this research, it can be noted that the majority of the practicing procurement practitioners have experience in the procurement management department ranging from 6 to 10 years, thereby indicating a percentage of 47.1. This is in line with the findings of Gilley and Rasheed (2000) who propagated that a favourable outcome is obtained through employees of high expertise.

14. Reliability statistics
Results show linearity in the variables. The factor analysis is hence reliable. To confirm this, the reliability test, cronbach alpha coefficients were 0.876; 0.889; 0.888; 0.902 and 0.970; for value engineering, variety reduction, standardisation, specifications, procurement performance and hence meet the prerequisite for reliability (cronbach alpha coefficient >0.70, Gujarati, 2017).

15. Multilinear regression colinearity statistics tests
The model suggests that coefficient of multiple determination, $R^2 = 0.766$ and the adjusted, $R^2 = 0.752$. This infers that approximately 77% of the variations in the independent variables explain the variations in procurement performance whereas about 23% is explained by other factors not presented in the multiple linear regression model. The probability value of the $F$—statistic 0.000 less than 0.05 showing that the overall multiple linear regression model is significant at 5% level of significance implying that the variations in procurement performance is explained by the variations in the regressors.

16. The role of procurement quality controls in procurement performance
Inferential analysis was employed in this research to determine if there is a correlation between an intervention and an outcome, as well as the metier of that correlation. This research conducted inferential analysis to establish the correlation between the independent variables and the dependent variable. The multiple linear regression analysis model summary is illustrated in Table 2.

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Table 1. Profile of procurement practitioners

| Biographical statistic | Biographical variable      | Frequency | Percentage |
|------------------------|----------------------------|-----------|------------|
| **Position:**          | Procurement Manager        | 10        | 14.3%      |
|                       | Procurement Officer        | 17        | 24.3%      |
|                       | Buyer                     | 31        | 44.3%      |
|                       | Procurement Clerk         | 12        | 17.1%      |
| **Levels of education of sampled procurement practitioners:** | Certificate in Procurement | 25        | 35.7%      |
|                       | Diploma in Procurement    | 26        | 37.1%      |
|                       | MCIPS                     | 5         | 7.1%       |
|                       | Bachelors Degree in Procurement | 7   | 10.0%      |
|                       | Masters Degree in Procurement | 5    | 7.1%       |
|                       | PhD                       | 2         | 2.9%       |
| **Experiences in the procurement department:** | 0 ≤ Experience ≤ 5 | 11        | 15.7%      |
|                       | 6 ≤ Experience ≤ 10       | 33        | 47.1%      |
|                       | 11 ≤ Experience ≤ 15      | 19        | 27.1%      |
|                       | Experience ≥ 16           | 7         | 10.0%      |

Source: Researcher or Author (2019)
The R value represents the simple correlation and is 0.875, which indicates a high degree of correlation. The coefficient of multiple determination, $R^2$ is 0.766 means that the independent variables contribute about 76.6% of the systematic variation in procurement performance while other influences not researched in this research subsidises 23.4% of the procurement performance. The regression appears to be very useful for making predictions since the value of $R^2$ is close to 1. The following table is the multiple linear regression one-way analysis of variance (ANOVA), which reports how well the multiple regression model predicts the dependent variable and is shown in Table 3.

A one-way analysis of variance (ANOVA) shown in Table 3, that delivered information about levels of patchiness within the multiple linear regression model and which moulded a foundation for tests of significance was utilised. The ANOVA F-statistic was utilised to test the research questions for the multiple linear regression coefficients for every variable to be equal to zero. An analysis to determine the joint effect of all the independent variables was done. All the independent variables were combined and convoluted in the analysis. The results of one-way Analysis of variance (ANOVA) for multiple linear regression coefficients are shown in Table 3. The analysis results show that the significance of F statistics is 0.000, which is less than 0.05. This infers that there is a significant correlation between value engineering, variety reduction, standardisation, specifications and procurement performance. The model estimation results are shown in Table 4.

The data findings in Table 4 show that value engineering is a significant and positive predictor of procurement performance (unstandardized beta coefficient = 0.538, $p$—value = 0.000 < 0.05), taking all other independent variables at zero, a unit upsurge in value engineering will lead to a 0.538 upsurge in procurement performance. Anonymous procurement manager commented the positive role of value engineering in open-ended interviews as follows:

“Surely value engineering (also called value analysis) boosts procurement performance since by efficient identification of unnecessary costs for example those costs which provide neither quality nor use to the product provides valuable products to customers with the lowest fees,” She said.

On the benefits of value engineering, another procurement manager said,

“I suppose by eliminating the costs that are unnecessary, it results in significant cost reduction, enhance the company’s profitability, financial performance and return on investment which will result in achieving procurement performance,” He said.
| Multiple linear regression model independent variables | Unstandardized Coefficients | Standardized Coefficients | T       | Sig.   |
|-------------------------------------------------------|-----------------------------|---------------------------|---------|--------|
|                                                       | B                           | Std. Error                | Beta    |        |
| (Constant)                                             | 1.631                       | .248                      | .6571   | .000   |
| C = Value engineering                                  | .538                        | .131                      | .747    | .000   |
| C = Variety reduction                                  | .234                        | .115                      | .268    | .047   |
| C = Standardisation                                    | .132                        | .202                      | .181    | .007   |
| C = Specifications                                     | .052                        | .198                      | .063    | .005   |

a. Dependent variable: procurement performance
A procurement manager added,

“In fact value engineering focuses on those value characteristics which are deemed most important from the user point of view. Certainly value engineering is a powerful methodology for solving problems and or reducing costs while maintaining or improving procurement performance and quality requirements,” He said.

The research by Siongok & Noor (2016) also discovered similar results of this research in their research on quality control system on procurement performance in Kenyan National Highways Authority where they found that value engineering plays a pivotal positive role in enhancing procurement performance. Variety reduction has positive significant effect in procurement performance (unstandardized beta coefficient = 0.234, \(p\)—value = 0.047 < 0.05), taking all other independent variables at zero, a unit upsurge in variety reduction will lead to a 0.234 upsurge in procurement performance of the energy sector. In interviewing procurement managers responsible for the procurement of each energy company, a procurement manager gave viewpoints on the positive role of variety reduction as follows:

“Unquestionably, instead of keeping large variety of inventory which performs the same function, simply narrowing it improves procurement performance. The technique without doubt, has more effect if applied in the right place and at the right time since it enables procurement practitioners to avoid duplication of items,” He said.

A procurement manager hailed the positive role of variety reduction thus:

“To our fellow procurement practitioners, variety reduction releases money tied up in inventory, lowers costs of production per order and lowers costs of materials per order; overall it results in cost reduction which will make the procurement department to be considered as a profit centre rather than being considered purely as a cost centre, thereby progressing procurement performance,” He said.

Another procurement manager was quoted in open-ended interviews saying,

“Yes, definitely for procurement to minimize waste and enhance procurement performance within the company, there is need for variety reduction. Variety reduction enhances procurement performance when considering capital purchases since it enables procurers to ensure compatibility with existing machinery and the range of spares carried to ensure against breakdowns can be substantially reduced,” She said.

An analogous result was found in the product solution spaces of engineer-to-order companies in Novenco in Denmark research by Haug et al. (2016) who found that variety reduction positively reduces internal product complexity by eliminating the product variety that does not create customer value. Standardisation was found to have a positive significant role in procurement performance (unstandardized beta coefficient = 0.132, \(p\)—value = 0.007 < 0.05). Taking all other independent variables at zero, a unit escalation in standardisation will lead to a 0.132 rise in procurement performance. In investigating procurement managers heading the procurement departments in each energy company viewpoints about standardisation in procurement performance context in open-ended interviews, a procurement manager commented as follows:

“Yes, standardising whenever and wherever possible the materials procured by the company improve procurement performance since it allows the procurer to procure at quantity discounted prices. It gives clear specification and removal of any uncertainty as to what is required on part of both procurer and the supplier,” She said.

As such, a procurement manager said,
“Indeed, uniformity on the products which we procure enables procurers to foster quality improvements, company’s competitive advantage by cost reduction which improves procurement performance. It also improves procurement performance because there is accurate comparison of quotes since all prospective suppliers or prospective bidders are quoting for the same thing,” He said.

Correlated results were found in separate studies of Carstea et al. (2016) and Blair et al. (2016), who found that the procurement should standardise the materials procured by the company so as to turn the process of procurement and management of material resources as a source for quality improvement and that a positive contributor to globalisation in recent years has been the rapid development of standards for business processes as well as products. These findings support results from Sa’nchez-Rodríguez et al. (2006) who found that standardisation in purchasing has a significant positive effect on business performance. The multiple linear regression analysis shows that specifications positively and significantly influence procurement performance (unstandardized beta coefficient = 0.052, p—value = 0.005 < 0.05), keeping other variables constant, a unit upturn in specifications will lead to a 0.052 upturn in procurement performance. Since the interviews with procurement managers were open-ended, a procurement manager gave supplementary traits to remark the positive role of specifications:

“I am of the view that performance, brand or trade name and sample specifications improve procurement performance in quality improvements which results in customer satisfaction because they indicate the required fitness for purpose or use to the supplier and communicate the requirements from the buyer to the supplier,” The procurement manager said.

Another procurement manager confirmed the positive role of specifications saying,

“I support that specifications will enable the procurement departments to improve on quality management in procurement since it enables procurement practitioners to trigger market innovation and satisfy user needs in a sustainable manner,” He said.

Another procurement manager was quoted saying,

“My opinion is that specifications improve procurement performance when a procurer has to purchase or is required to purchase a particular type of goods or services from more than one bidder or supplier since it ensures the identity of goods purchased. Thus, the materials with identical nature can be purchased from different suppliers or bidders on the basis of specifications only,” He said.

A procurement manager also commented how specifications improve procurement performance saying,

“I think specification buying includes more prospective suppliers or bidders to bid a request for quotation (RFQ) or an invitation to tender (ITT) because all of them know exactly what is required and they also know what the other suppliers or bidders are bidding for. Now, increased competition proves very economical to procurement practitioners in form of lower costs which in turn will improve the procurement performance,” She said.

This result is supported by Anisimova (2015) who found that performance specifications, brand or trade name specifications and sample specifications positively improved quality management in procurement. The multiple linear regression analysis to determine the correlation between the parameters of procurement performance and the four independent variables of procurement quality controls becomes:

\[
P = 1.631 + 0.538(C_1) + 0.234(C_2) + 0.132(C_3) + 0.052(C_4) + \xi \text{ in unstandardized form}
\]

\[
(0.000) (0.000) (0.047) (0.007) (0.005)
\]

Nonetheless, at 5% level of significance, the four independent variables of procurement quality controls, as measured by value engineering, variety reduction, standardisation and specifications,
have significant correlation in procurement performance with p-values of 0.000, 0.047, 0.007 and 0.005, respectively, and hence their multiple linear regression coefficients are retained in the final predictor multiple linear regression model for procurement performance as shown below:

\[ P = 1.631 + 0.747(C_1) + 0.268(C_2) + 0.181(C_3) + 0.063(C_4) \text{ in standardised form} \]

\[
\begin{array}{ccccc}
(C_1) & (C_2) & (C_3) & (C_4) \\
(.000) & (.047) & (.007) & (.005) \\
\end{array}
\]

The results of this research surmise that value engineering contributes more to procurement performance, trailed by variety reduction, then standardisation, whereas specifications contribute the slightest to procurement performance as shown by their beta (β) coefficients.

17. Conclusions, recommendations, further evaluation and replication of findings

This research concludes that, enhanced procurement performance and the best procurement function can be attained through value engineering, variety reduction, standardisation and by use of specifications to indicate the required fitness for purpose or use to the supplier or bidder. This research concludes that, due to the significant share that procurement quality controls and costs of procurement embrace in the turnover of a company, procurement quality controls to reduce them will have a colossal effect on procurement costs and hence on service delivery. Corroborated by procurement managers’ viewpoints, it was clear that procurement performance can be achieved by the four procurement quality controls used in this research measured by value engineering, variety reduction, standardisation and specifications.

The evidence-based recommendations emanating from this research are:

- The procurement should use value engineering or analysis in order to efficiently identify and eliminate unnecessary costs which provide neither quality nor use to the product to improve the company’s profitability, financial performance and return on investment which will result in achieving procurement performance. This could be done by using rational logic (a unique “how”—“why” questioning technique) and the analysis of the procurement function to identify relationships that increase value.

- Product variety reductions should be used so as to release money tied up in inventory, lower costs of production per order and lower costs of materials per order, overall cost reduction to progress procurement performance. This can be achieved by using standardised components and sub-assemblies to make end products that are dissimilar in appearance and performance so that variety of final products uses only a few basic components.

- Procurement directors and procurement managers should standardise whenever and wherever possible the materials procured to allow procurement at quantity discounted prices so as to turn the process of procurement as a source for quality improvement and achieve procurement performance. To achieve this, the procurement should observe the following attributes: ensure specifications are observed, ensure new specifications are suitably revised and approved, ensure old specifications are reviewed, replaced, amended or even eliminated to achieve procurement performance.

- The procurement should use performance, brand or trade name and sample specifications enable procurement departments to improve on quality management in procurement. Performance, brand or trade name and sample specifications guarantee procurement performance in quality improvements. Therefore, practicing procurement practitioners are more benefited by specifications, if the benefits are passed onto them by suppliers.

- There is a need for researching several aspects related to procurement quality controls in procurement. The empirical evidence is however minimal. Further, important concerns such as why quality consciousness in procurement, creating corporate advantage through procurement quality controls and understanding the effect of procurement quality controls in the correlation between procurement performance and firm performance are some of the areas worth researching in the future.

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God is my Banner

God is our refuge and strength, A very present help in trouble
Psalms 46 verse 1
Thy word have I hid in mine heart, That I might not sin against God
Psalms 119 verse 11
Looking for that blessed hope, and the glorious appearing of the great God and our Saviour Jesus Christ
Titus 2 verse 13

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## Appendix I: Descriptive Statistics

### Procurement Quality Controls

| Independent Variables | N  | Range | Mean  | Std. Deviation | Skewness  | Kurtosis  |
|-----------------------|----|-------|-------|----------------|-----------|-----------|
| Procurement Quality Controls | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| Value Engineering     | 70 | 4.00  | 4.1429 | 1.20729        | -1.452    | .287      | 1.029     | .566       |
| Variety Reduction     | 70 | 4.00  | 4.0143 | 1.17329        | -1.192    | .287      | .421      | .566       |
| Standardisation       | 70 | 4.00  | 4.0857 | 1.25966        | -1.464    | .287      | 1.037     | .566       |
| Specifications        | 70 | 4.00  | 4.2857 | .99481         | -1.700    | .287      | 2.681     | .566       |
| Valid N (listwise)    | 70 |       |       |                |           |           |           |            |
## Procurement Performance

| Dependent Variable                                                                 | N  | Mean  | Std. Deviation | Skewness  | Kurtosis  |
|-----------------------------------------------------------------------------------|----|-------|----------------|-----------|-----------|
|                                                                                   |    | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| Keeping all procurement contracts within the procurement department makes for easy monitoring contract compliance thus save costs and improve financial performance | 70 | 4.2143 | 1.07532 | -1.668 | .287 | 2.257 | .566 |
| The procurement policies and quality controls adopted by the procurement help increase return on investment | 70 | 4.0000 | 1.23,945 | -1.269 | .287 | .549 | .566 |
| The procurement aligns procurement strategy to company strategy leading to more productivity which enhance profitability for the firm | 70 | 4.2857 | .96,523 | -1.804 | .287 | 3.318 | .566 |
| The staffing of the procurement department leads to quality improvements of goods services | 70 | 4.2286 | 1.14,425 | -1.541 | .287 | 1.430 | .566 |
| The procurement quality controls leads to high overall firm competitiveness | 70 | 4.0143 | 1.34,588 | -1.128 | .287 | -1.70 | .566 |
| The company-whole procurement quality controls results in lower total costs and costs reductions | 70 | 4.2286 | .99,523 | -1.479 | .287 | 1.630 | .566 |
| The company’s technology satisfies its procurement quality controls and leads to customer satisfaction | 70 | 4.3000 | 1.02646 | -1.715 | .287 | 2.453 | .566 |
| The procurements quality initiatives and social responsibilities help align the it closer to the customers and regulatory authorities | 70 | 4.2286 | 1.03799 | -1.918 | .287 | 3.647 | .566 |

Valid N (listwise) 70
Appendix II: Research Questionnaire

Section A: Biographical Statistics

1. Position or Designation
Please kindly provide your position or designation (tick where appropriate)

| Procurement Manager | Procurement Officer | Buyer | Procurement Clerk |
|---------------------|---------------------|-------|-------------------|
| 01                  | 02                  | 03    | 04                |

2. Experience in the procurement department
Please kindly provide your experience in the procurement department in the energy sector (tick where appropriate)

| Experience | 0 ≤ Experience ≤ 5 | 6 ≤ Experience ≤ 10 | 11 ≤ Experience ≤ 15 | Experience ≥ 16 |
|------------|--------------------|----------------------|-----------------------|-----------------|
| 01         | 02                 | 03                   | 04                    |                 |

3. Educational Level
Please kindly provide your level of education (tick where appropriate)

| Certificate in procurement | Diploma in procurement | MCIPS | Bachelors Degree in Procurement | Masters Degree in Procurement | PhD |
|---------------------------|------------------------|-------|--------------------------------|-------------------------------|-----|
| 01                        | 02                     | 03    | 04                             | 05                            | 06  |

Section B: Procurement Quality Controls Practices

4. Kindly indicate the extent to which the company implements or practices the following activities relating to procurement quality control practices
1 = very small extent, 2 = Small extent, 3 = Moderate extent, 4 = Great extent and 5 = Very great extent

(Tick where appropriate)

| No | Procurement Quality Controls Practices | 1 | 2 | 3 | 4 | 5 |
|----|----------------------------------------|---|---|---|---|---|
| 1  | Value Engineering or Value Analysis    |   |   |   |   |   |
|    | 1. The procurement identifies unnecessary costs when buying |   |   |   |   |   |
|    | 2. The procurement management department helps in significant cost reduction in the firm |   |   |   |   |   |
| 2  | Variety Reduction                      |   |   |   |   |   |
|    | 1. Is the procurement management department narrowing the range of goods and services procured? |   |   |   |   |   |
|    | 2. The company procurement function is reducing the range of goods and services procured |   |   |   |   |   |
| 3  | Standardisation                        |   |   |   |   |   |
|    | 1. Uniformity on products procured is the focus of the company |   |   |   |   |   |
|    | 2. The procurement has basis for accurate comparison of quotations |   |   |   |   |   |
| 4  | Specifications                          |   |   |   |   |   |
|    | 1. The company uses performance specifications for goods and services with specific purpose, function or application |   |   |   |   |   |
|    | 2. The company use brand or trade name specifications is preferred to performance specifications by the procurement for goods and services that rely on brand names known for their proven quality |   |   |   |   |   |
|    | 3. The company employs sample specifications to suppliers in its procurement operations and goods, services with complex specifications |   |   |   |   |   |
Section C: Procurement Performance

5. Kindly indicate the extent to which you agree with the following statements concerning the influence of procurement quality controls practices in procurement performance
1 = very small extent, 2 = Small extent, 3 = Moderate extent, 4 = Great extent and 5 = Very great extent

(Tick where appropriate)

| Procurement Performance Procedures                                                                 | 1 | 2 | 3 | 4 | 5 |
|---------------------------------------------------------------------------------------------------|---|---|---|---|---|
| Keeping all procurement contracts within the procurement department makes easy monitoring contract compliance, thus saves costs and improve financial performance |   |   |   |   |   |
| The procurement policies and quality controls adopted by the procurement help increase return on investment |   |   |   |   |   |
| The procurement aligns procurement strategy to company strategy leading to more productivity which enhances profitability for the firm |   |   |   |   |   |
| The staffing of the procurement department leads to quality improvements of goods services          |   |   |   |   |   |
| The procurement quality controls lead to high overall firm competitiveness                           |   |   |   |   |   |
| The company-wide procurement quality controls results in lower total costs and costs reductions     |   |   |   |   |   |
| The company’s technology satisfies its procurement quality controls and leads to customer satisfaction |   |   |   |   |   |
| The procurements quality initiatives and social responsibilities help align the it closer to the customers and regulatory authorities |   |   |   |   |   |

Appendix III: Interview Questions for Procurement Managers

1. What are the types of procurement quality controls implemented in your Company?

Probe

- Value Engineering?
  - (i) Identification of unnecessary costs
  - (ii) Significant cost reduction

- Variety Reduction?
  - (i) Narrowing the range of goods and services procured
  - (ii) Reducing the range of goods and services procured

- Standardisation?
  - (i) Uniformity on products procured
  - (ii) Providing basis for accurate comparison of quotation
• Specifications?
  (i) Performance specifications
  (ii) Brand or Trade name specifications
  (iii) Sample specifications

2. What is the role of procurement quality controls in procurement performance?

Probe
• Does value engineering lead to high procurement performance?
• Does variety reduction result in high procurement performance?
• Does standardisation lead to high procurement performance?
• Do specifications result in high procurement performance?