INFLUENCE OF ELECTRONIC PAYMENT SYSTEMS IN PROCUREMENT PERFORMANCE IN PUBLIC ENTITIES IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

The study’s main objective was to evaluate influence of electronic payment systems in procurement performance in public entities in Nairobi City County. The study was guided by the following specific objectives; to establish the influence of mobile banking system on procurement performance in public entities in Nairobi City County to examine the influence of internet banking system on procurement performance in public entities in Nairobi City County, to determine the influence of virtual cards system on procurement performance in public entities in Nairobi City County and to assess the influence of Real Time Gross Settlement system on procurement performance in public entities in Nairobi City County. This study used descriptive research design. The study employed a census technique in determination of the size of the population to be used for the study. The researcher selected 101 respondents on whom to conduct the study. The study used questionnaires to collect primary data. Data collected was sorted, classified and coded then tabulated for ease of analysis. The data will be
summarized and categorized according to common themes by the use of the SPSS (version 22) computer software aided analysis. Multiple regression model was employed to analyse the data on influence of electronic payment systems in procurement performance in public entities in Nairobi City County. The descriptive and inferential statistics regression analysis were used to show the relationship of the independent variables and dependent variable at 5% level of significance. It is notable that there exists a strong positive relationship between the independent variables and dependent variable as shown by R value (0.765). The coefficient of determination ($R^2$) explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable and the four independent variables that were studied explained 58.50% of the performance of procurement in public entities as represented by the $R^2$. The analysis showed that mobile banking had the strongest positive (Pearson correlation coefficient =.765, p-value= .000< .05 ) influence on performance of procurement in public entities. In addition, internet banking, virtual card systems and RTGs are positively correlated to performance of procurement in public entities with Pearson correlation coefficient of .811, .777 and .701 with p-values of .002 < .05, . 003< .05, .004 < .05 respectively. The study recommends for enhancement of adoption mobile banking system to increase efficiency, costs reduction and transparency in procurement performance of public entity. There is need to make appropriate choice of different systems that enhance procurement performance. It is important to ensure that there is easy access through mobile banking system to improve efficiency in procurement performance in public entity. The study recommends that the internet banking should be improved to enhance procurement performance. This has a relative advantage in improving efficiency, cost reduction and transparent in procurement performance compared to traditional payment methods. The virtual card systems to enhance to enhance efficiency reduce costs and increase transparency in procurement performance in public entities. The study recommends for improvement in RTGS to a great extent. A review of literature indicated that there has been limited amount of research on the influence of electronic payment systems in procurement performance in public entities in the Kenyan context. Thus, the findings of this study serve as a basis for future studies on electronic payment systems in procurement performance. The study has contributed to knowledge by establishing that electronic payment systems in procurement performance in public entities in the Kenyan context.

**KEY TERMS:** Electronic payment systems, Internet Banking, Mobile banking, Performance,
BACKGROUND OF THE STUDY

Organisations are forced to reinvent their relationships with customers and suppliers due to the weakening global economic conditions. Costs must therefore be lowered throughout the procurement process by focusing on value addition. Bottlenecks must be removed and performance measurements focus on total system efficiency and equitable reward distribution to key players in the process; to achieve win-win situations. The major aim is to create customer satisfaction at the end point of delivery and continuous improvement of procurement performance. This realisation of procurement goals is influenced by internal and external forces though interactions between certain elements like professionalism, staffing levels and budget resources, procurement organisational structure, internal control policies rules and regulations all need attention and influence procurement performance (Lardenoije, van Raaij and van Weele 2005).

Simatupang and Sridharan (2005) emphasise that information is essential in organisations and can be used to integrate procurement process activities both within a process and across multiple processes through electronic systems. ICT provides new ways to store, process, distribute and exchange key information with customers and suppliers in the entire procurement system. ICT provides a collaborative platform by allowing customers and suppliers to work together through value chain integration especially in instances where electronic payment systems are incorporated in the processes, which is made possible through separate activities being knitted together by faster and more reliable information flows which automatically configures requirements in the procurement system. This helps organisations reduce transaction and production costs and achieve operational efficiency (Chopra, Meindl and Dhamram 2007).

Economic conditions in the global market are also forcing organisations to reinvent their relations with customers and suppliers alike. Costs may thus be lowered throughout the
procurement process by focusing on value addition and performance measurements focus on total system efficiency and equitable reward distribution to key players in the process. Procurement performance has been attracting practitioners, researchers and academicians due to poor performance. E-procurement which includes electronic payment systems adoption has rapidly increased since yet organisations are still facing challenges associated with its use (Gioconda, 2010).

According to Kim and Rogers (2005), costly, time consuming and inefficient procurement processes will finally be minimised if not eliminated due to the emerging technologies. This will be through enabling major improvements in terms of lower administrative overhead, better service quality, timely location and receiving of products and increased flexibility. With most organisations spending at least one third of their overall budget to purchase goods and services procurement holds significant business value. Public organisations therefore need to ensure that their procurement functions run in the most efficient manner possible and its performance is effective. The most possible means to enhance the same is through use of technology. Hence electronic payment systems and particularly the influence they play on procurement performance of Public Organization in Kenya is the focus of this research.

Conceptual Framework

A Conceptual frame work is a hypothesized model identifying the concepts under study and their relationships. According to Mugenda and Mugenda (2012), the purpose of a conceptual framework is to help the reader to quickly see the proposed relationship between the independent and dependent variables. It is structured from a set of broad ideas and theories that help a researcher to properly identify the problem they are looking at, frame their questions and find suitable literature. Most academic research uses a conceptual framework at the outset because it helps the researcher to clarify his research question and aim. In this study, the conceptual framework illustrates the interaction between the independent variables and the
dependent variable in the study. The independent variables are; mobile banking, internet banking, Virtual Cards System and the Real Time Gross Settlement system while the dependent variable is the procurement performance in public organisations in Kenya. The conceptual framework is presented in the Figure 1 below.
Independent Variables

- Observability
- Accessibility
- Usefulness

Internet Banking
- Relative Advantage
- Compatibility
- Simplicity

Virtual Cards System
- Exact payments Processing
- Transaction Details
- Level of Fraud

RTGS System
- Efficient Service
- Security
- Outcome certainty

Dependent Variable

Procurement Performance in Public Entities
- Improved efficiency
- Cost reduction
- Transparency

Figure 1; Conceptual Framework
Mobile banking is using mobile devices to provide financial transactions like checking account balances, funds transfers and accessing bank products and services and communication from anywhere at any time (Ensor, Montez and Wannemacher 2012). Banking services are offered in most websites using the new channels for transactions and communication such that almost all banks offer online or internet banking services and information (George, 2002).

Virtual cards can simply be put as credit card numbers without the plastic (Robinson 2013). Adding virtual payments into the procurement process can help entities pay invoices more efficiently. The payment cards come with built in financial controls that reduce time-consuming and costly exception processing. Whether the card is a single use or a dynamic credit control virtual card, the buyer can set the exact payment to be paid. This control hence eliminates the possibility of either overpayment or short payment (Ardent Partners Ltd, 2015). Virtual payment cards contain rich remittance information. Compared to other e Payment methods the cards have no space limitations in terms of characters of space to add in transaction details.

The Real Time Gross Settlement system was one developed by authorities in the financial sector that was to enhance efficiency in service by the infrastructure facilitating payment, clearing and settlements. This was due to the core influence in the economy that payments in financial and securities transactions played (Patricia, 2004). The global action to introduce the Real Time Gross Settlement system was due to significant risks and exposures in financial and securities transactions that could be a channel for the transmission of disturbances from one part of the economy or financial system to another. The system therefore minimised the risk of outcome uncertainty due to the fact that the failure of one participant would cause others to be unable to meet their obligations when due hence increasing stability and security in the financial sector (Patricia, 2004).
Muhammad (2004) defines procurement performance as the measurement of performance of current activities or practices by any particular firm. To measure performance of procurement activities practiced by entities, five dimensions of measurement were used namely Supply Chain Flexibility and Integration, Responsiveness to Customers, Supplier Performance and Partnership Quality. The variables used to measure the performance and can be tied to electronic payment systems construct are levels of improved efficiency, cost (Chen, Paulraj and Lado 2004) and transparency (Narasimhan and Kim 2002).

METHODOLOGY

Research Design- The research study adopted a descriptive survey design.

Target Population- The total population was 101 public entities in Nairobi City County, Kenya.

Data Collection- Data collection involved a self-administered questionnaire.

Data Analysis- Quantitative data was analysed using descriptive statistics. Data analysis was done using SPSS (Version 22) and presented through percentages, means, standard deviations and frequencies. The information was displayed by use of bar charts, graphs and pie charts.

The inferential statistics using correlation analysis was carried out to establish the relationship between the research variables and qualitative data from the questioners. Qualitative analysis allowed the researcher to learn and understand the underlying issues as well as get actual facts on the role of electronic payment systems in procurement performance in public entities in Nairobi City County. Further, a multiple regression analysis was used to establish the relationship between the dependent and the independent variables (Mugenda and Mugenda, 2012). The equation for procurement performance of Public entities in Nairobi City County was expressed in the following equation:

\[ Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon, \]

where,

\[ Y = \text{Performance of Public entities in Nairobi City County}, \]
\( \beta_0 \) = constant (coefficient of intercept), \\
\( X_1 \) = Mobile banking \\
\( X_2 \) = Internet banking \\
\( X_3 \) = Virtual Cards Settlement system \\
\( X_4 \) = Real Time Gross Settlement system \\
\( \varepsilon \) = Error term \\
\( \beta_1 \ldots \beta_4 \) = regression coefficient of four variables.

**FINDINGS OF THE STUDY**

The study set out to examine the Influence of electronic payment systems in procurement performance in public entities in Nairobi City County, Kenya. To this end, four variables were conceptualized as components of electronic payment systems affecting procurement performance thereof. These include: mobile banking, internet banking, virtual card systems and RTGS systems.

The respondents were kindly asked to show whether rate of change in procurement performance in relation to the following categories (change by ‘increase by 5%, decrease by 5%, increase above 5%, and decrease below 5%) in the public entities in the last 5 years (2011 to 2015). The study established that the improved efficiency had made a good increase by 5% with an average of 40% of the respondents stated that it increased by 5%, with an average of 60% of the respondents indicated that it increased by above 5%, with an average of 42% of the respondents posited that it increased by less than decrease by 5%, with an average of 35% of the respondents cited that it decreased by 5%, with an average of 55% of the respondents indicated that it decreased below 5% and an average of 23% of the respondents indicated that it decreased by less than 5% in the last five years. The study findings imply that there was slight improvement on rate of change in procurement performance on efficiency, reduction of costs
and enhanced transparency in the public entities in the last five years; the results are as shown in Table 1.

**Table 1: Rate of change in procurement performance**

<table>
<thead>
<tr>
<th>Category</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Efficiency</td>
<td>44%</td>
<td>67%</td>
<td>58%</td>
<td>57%</td>
<td>54%</td>
</tr>
<tr>
<td>Reduced costs</td>
<td>65%</td>
<td>33%</td>
<td>45%</td>
<td>76%</td>
<td>55%</td>
</tr>
<tr>
<td>Enhanced Transparency</td>
<td>55%</td>
<td>38%</td>
<td>77%</td>
<td>66%</td>
<td>67%</td>
</tr>
</tbody>
</table>

**Multiple Regression Analysis Model**

The study adopted a multiple regression analysis so as to establish the relationship of independent variables and dependent variables. The study applied SPSS version 22 to code, enter and compute the measurements of the multiple regression analysis. According to the model summary Table 2, the coefficient of determination ($R^2$) is used to measure how far the regression model’s ability to explain the variation of the independent variables. $R$ is the correlation coefficient which shows the relationship between the independent variables and dependent variable. It is notable that there exists strong positive relationship between the independent variables and dependent variable as shown by $R$ value (0.765). The coefficient of determination is between zero and one. The data showed that the high $R$ square is 0.585. It shows that the independent variables in the study were able to explain 58.50% variation in the procurement performance in public entities while the remaining 41.50% is explained by the variables or other aspects outside the model. The standard error is minimal with a value of 0.05 meaning the model used in the study will have minimal effects of errors associated with
procurement performance.

**Table 2: Model Summary (Overall)**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.765</td>
<td>.585</td>
<td>.512</td>
<td>.008</td>
</tr>
</tbody>
</table>

F-test was done to test the effect of independent variables on the dependent variable simultaneously. According to Bordens and Abbott (2008), F-statistic test basically shows whether all the independent variables included in the model jointly influence the dependent variable. Based on the study results of the ANOVA Test or F-test in Table 3, obtained F-count (calculated) value was 81.500 greater the F-critical (table) value (32.654) with significance of 0.000. Since the significance level of 0.000< 0.05 we conclude that the set of independent variables affect the procurement performance in public entities and this shows that the overall model was significant.

**Table 3: ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>D.f</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>19.876</td>
<td>4</td>
<td>63.530</td>
<td>81.500</td>
<td>.000a</td>
</tr>
<tr>
<td>Residual</td>
<td>43.654</td>
<td>56</td>
<td>.7795</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>63.530</td>
<td>60</td>
<td>.7795</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NB: F-critical value = 32.654;

**Regression Coefficients**

The study conducted a multiple regression analysis so as to determine the relationship between the dependent variable and independent variables. With the aid of model \( Y = \alpha + \beta_1 X_1 + \beta_2 X_2 \)
+ β₃X₃ + β₄X₄ + ε; Y = Dependent variable (performance in procurement); α = Constant (The intercept of the model), β = Coefficient of the X variables (independent variables); X₁= Mobile Banking; X₂= Internet Banking; X₃= Virtual card systems; X₄= RTGS; ε= is the error term.

From the study findings on the regression equation established, taking all factors into account (independent variables) constant at performance in procurement in public entities will be 32.765. The data findings analysed also shows that taking all other independent variables at zero, a unit increase in mobile banking will lead to a 0.876 increase in performance in procurement in public entities; a unit increase in internet banking will lead to a 0.811 increase in performance in procurement in public entities, a unit increase in virtual cards systems will lead to 0.777 increase in performance in procurement in public entities and a unit increase in RTGS will lead to 0.700 increase in performance in procurement in public entities. This infers that mobile banking contributed most to performance in procurement in public entities.

Further, based at 5% level of significance, mobile banking was found to have a significance level of 0.000 thus the value of less than 0.05; internet banking show a significance level of 0.002 thus the value of less than 0.05, virtual cards system was found to have a significance level of 0.003 thus the value of less than 0.05, RTGS show was found to have a significance level of 0.004 thus the value of less than 0.05 hence the most significant factor mobile banking. The coefficients are summarised in Table 4.
### Table 4: Coefficient Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \beta )</td>
<td>( \beta )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. Error</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>32.765</td>
<td>5.555</td>
<td>3.987</td>
</tr>
<tr>
<td>X₁-Mobile</td>
<td>.876</td>
<td>.585</td>
<td>.502</td>
<td>4.765</td>
</tr>
<tr>
<td>X₂-Internet</td>
<td>.811</td>
<td>.556</td>
<td>.455</td>
<td>2.432</td>
</tr>
<tr>
<td>X₃-Virtual card systems</td>
<td>.777</td>
<td>.487</td>
<td>.405</td>
<td>2.309</td>
</tr>
<tr>
<td>X₄-RTGS</td>
<td>.700</td>
<td>.356</td>
<td>.309</td>
<td>2.103</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Procurement Performance in Public entities

Therefore, the general form of the equation was to predict performance in procurement in public entities from \( X₁ = \) Mobile Banking; \( X₂ = \) Internet Banking; \( X₃ = \) Virtual card systems; \( X₄ = \) RTGS; \( \varepsilon \) is the error term is: \( Y = \beta₀ + \beta₁X₁ + \beta₂X₂ + \beta₃X₃ + \beta₄X₄ + \varepsilon \) becomes: \( Y = 32.765 + 0.876X₁ + 0.811X₂ + 0.777X₃ + 0.700X₄ + 5.555 \). This indicates that performance in procurement in public entities = 32.765 + 0.876*Mobile banking + 0.777*Internet banking + 0.777*Virtual card systems + 0.700*RTGS.
Summary of findings

The study sought to establish the influence of mobile banking, internet banking, virtual card systems and RTGS on procurement performance in public entities in Nairobi, Kenya. The empirical literature showed that electronic payment systems all had a positive impact on the overall procurement performance in public entities. From the study results, majority of the respondents indicated that mobile banking, internet banking, Virtual cards system and RTGS improve efficiency, reduce costs and enhance transparency in procurement performance compared to traditional payment methods.

Further, the study revealed that all the variables statistically, strongly and significantly correlated to procurement performance in public entities at 5% level of significance as it had a positive relationship with the dependent variable. This reveals that mobile banking, internet banking, virtual cards system and the RTGS system through electronic payment systems are important factors that can enhance procurement performance in public entities.

Conclusion of the Study

The study established that adopting the mobile banking system affect efficiency, costs reduction and transparency in procurement performance of public entity. It is motivated the entity to use mobile banking, enhanced choice of different systems, it encouraged prompt payment. It was also established that easy access through mobile banking system improves efficiency in procurement performance in public entity.

In addition, from the study results it established that the internet banking affect procurement performance and has a relative advantage in improving efficiency, cost reduction and transparent in procurement performance compared to traditional payment methods. The simplicity in operations of the internet banking system led to improved efficiency, cost reduction and transparent in procurement performance in your entity.
The study established that virtual card systems affect procurement performance as it improves efficiency, reduce costs and increase transparency in procurement performance in public entity. It eliminates over and under payments in transactions, provides a fall back in case of any challenges and acts as a reference of operations between the supplier and entity.

The RTGS to a great extent enables the efficient service and improve efficiency; reduce costs and transparency in procurement performance in public entity. The security of transactions through the RTGS system through electronic payment systems is an important factor that can enhance procurement performance in public entities. The RTGS enhances speed in transaction performance, is readily available, provides immediate proof of transaction and provides immediate proof of transaction.

REFERENCES

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