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Assessing the Effects of Change Management on E-Procurement Reforms in Uganda

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Abstract

This study examines the relationship between effective change management and successful e-procurement reform in Uganda, addressing a critical gap in the literature. A convergent mixed methods design was employed, collecting and analysing quantitative and qualitative data from 170 respondents through questionnaires and interviews. Pearson's linear correlation coefficient and partial F-tests were used to determine variable relationships and predictor contributions. The study reveals that planning, administration, and solidifying change significantly predict e-procurement reform success at the Public Procurement and Disposal of Public Assets Authority (PPDAA). The research suggests that optimal e-government procurement hinges on strategic planning, effective change administration, and stakeholder training. Policymakers should implement mechanisms enhancing these change management aspects. Effective administration ensures seamless communication, monitoring, and supervision of reforms. This study contributes to the e-procurement literature in developing countries, providing valuable insights for policymakers and practitioners. The research highlights key change management dimensions influencing e-procurement implementation, informing strategies for successful reform in Uganda and similar contexts.

Keywords: Change management, E-procurement reforms, public financial management, procurement reform success, and developing countries

1. Introduction

The eGP system is an integrated system created to digitise government departments, agencies, and ministries' procurement and disposal procedures. As a result, it reduces the need for human interaction and makes it possible to track and access papers online. In order to combat fraud, it seeks to strengthen competition, encourage responsibility, and raise transparency across the whole procurement process. Hence the need for change mindset in organisations.

Effective organizational change requires employees to be open to transformation, perceiving it as beneficial and trusting its outcome (Saetren & Laumann, 2017). This is crucial in public sector procurement, where competent, motivated, and proficient human resources drive efficiency (Gladilina, 2017). However, employee resistance persists, necessitating proactive management strategies (Maddi et al., 2020). Sub-Saharan Africa's public procurement landscape has undergone significant transformations since the 1990s, driven by international obligations (Manu et al., 2018; Stoffel et al., 2019). Despite efforts, many developing countries struggle to meet international standards, resulting in outdated procurement systems (Bawole & Adjei-Bamfo, 2020).

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Africa is transforming its procurement sector through key initiatives, prioritizing transparency, efficiency, and accountability (Panya & Awuor, 2023). South Africa's 2015 Supply Chain Management Review set a clear improvement agenda, while Multi-Donor Budget Support Programs promote country ownership and capacity building. East Africa's successful implementation of procurement and financial management reforms, confirmed by Waithaka, et al.,'s (2022) research, demonstrates progress. Tanzania, among other countries, is enhancing its public finance management and procurement systems through initiatives funded by the World Bank, notably the $50 million Public Finance Management and Procurement Systems for Service Delivery Program (Piatti-Fünfkirchen& Schneider, 2018). These reforms drive economic growth and development, showcasing Africa's dedication to effective public procurement, and aligning with global best practices stressing the importance of transparency, accountability, and efficiency. Donors now consider well-functioning procurement systems essential for effective development funding (Manu, et al., 2018). To achieve this, countries are implementing electronic procurement systems, such as Uganda's government procurement portal, which promotes transparency and accountability. By adopting these strategies, Sub-Saharan Africa can overcome the challenges of outdated procurement systems and achieve efficient, accountable, and sustainable public procurement.

Uganda's public procurement system transformed from centralized and inefficient to reformed, starting in the late 1990s, as noted by researchers Basheka (2021) and Andrews (2018). The legacy system, plagued by delays and malpractice, hindered effective development due to outdated regulations and a lack of transparency (Williams-Elegbe, 2018; Basheka, 2021). The PPDA addressed these challenges by implementing e-procurement reforms, commencing with a 2018 pilot in 11 Ministries (PPDA Strategic Plan, 2021-2026). Electronic procurement leverages IT to enhance efficiency, transparency, and cost reduction (Chesseto et al., 2019; Ahimbisibwe et al., 2018). However, poor change management hinders effective implementation (Fernandes & Vieira, 2015). Despite efforts, PPDA faces challenges, including delays, manual processes, and resistance to change (Auditor-General Report, 2022). Addressing these issues is crucial to ensuring the system's success and regulatory efficacy (PPDA Strategic Plan, 2021-2026). Effective change management is vital to overcome obstacles and ensure successful e-GP system adoption.

This study investigates the vital link between effective change management and successful e-procurement reforms in Uganda, focusing on the PPDA. It analyzes how change management affects e-procurement reform outcomes, highlighting PPDA's challenges and opportunities. The research objectives include examining the interplay between planning, administering, and solidifying change and its effects on e-procurement reform success in Uganda.

The paper is divided into six key sections. Section 2: Literature Review critically examines existing research on change management and e-procurement reforms, laying the groundwork for the study. Section 3 outlines the research design, data collection methods, and analysis techniques employed to investigate the research questions. Section 4 presents the findings, highlighting significant trends and patterns that have emerged from the data. Section 5 delves deeper into the results, exploring their implications and providing recommendations for improvement. Section 6 summarizes the study's contributions, acknowledges its limitations, and identifies avenues for future research, with the ultimate goal of enhancing transparency, efficiency, and accountability in Uganda's public procurement processes.

Literature review

Effective change management is vital for e-procurement reform success. Notable models supporting this notion include Lewin's Change Management Model (Lewin, 1951), Kotter's Eight-Step Change Model (Kotter, 1995), ADKAR Change Management Model (Hiatt, 2006), and McKinsey 7S Framework (Waterman et al., 1980). However, Lewin's model is particularly relevant due to its simplicity and flexibility. Its three-step approach—unfreezing, changing, and refreezing—addresses organizational inertia, emphasizes stakeholder involvement, and provides a structured approach to managing complex change (Burnes, 1996). This study applies Lewin's model to explore its efficacy in facilitating effective change management in Uganda's PPDA.

Effective change management is vital for successful e-procurement reforms, facilitating a seamless transition to new practices and technologies (Kotter, 1995). Leveraging Lewin's Change Management Model (Lewin, 1951), which comprises unfreezing, changing, and refreezing stages (Burnes, 2020), can ensure success. Critical factors include leadership commitment, effective communication, training, and monitoring. Successful e-procurement reforms also rely on transparency, efficiency, and stakeholder engagement (Waithaka et al., 2022; Basheka, 2021; Karthik & Kumar, 2013). Uganda's PPDA can overcome e-procurement reform challenges by implementing effective change management strategies.

Effective change management requires institutionalization through three essential attributes: planning, administration, and solidification. Planning involves defining vision, objectives, and strategy (Kotter, 1995). Administration encompasses communication, stakeholder engagement, training, and progress monitoring (Hiatt, 2006). Solidification reinforces new behaviors, embeds change into culture, and ensures sustainability (Lewin, 1951). Integrating these attributes enables organizations to implement successful change management strategies, driving lasting transformation and minimizing disruption. To contextualize and provide depth to this study, we investigated the institutionalization of sustainable change management practices, focusing on three critical components: planning change, change administration, and solidifying change.

Planning Change and E-Procurement Reforms

Planning change in e-procurement reform requires clear articulation (Kotter, 1995), risk identification (Hiatt, 2006), stakeholder analysis (Freeman, 1984), and performance metrics (Neely et al., 1994). Studies by Adjei-Bamfo et al. (2019) and Manoharan and Ingrams (2018)highlight the importance of creating a shared need before implementing e-procurement systems. This shared need helps establish a clear understanding of the problem and prompts staff to adopt changes. A shared vision and targeted resource allocation are critical success factors. Studies by Joshi and Islam (2018) and Khan et al. (2021)show that staff alignment with a common vision minimizes resistance and fosters achievement. Similarly, management support plays a significant role in e-procurement success, as it influences staff thoughts and actions, decision-making, and resource allocation (Alqudah &Muradkhanli, 2021; Veeramootoo et al., 2018). Alqudah and Muradkhanli (2021) and Veeramootoo et al. (2018) emphasize the need for management to generate support, fund reforms, and train change agents to facilitate a smooth transition. Studies by Adjei-Bamfo et al., (2019) and Joshi and Islam (2018) highlight the importance of establishing a clear case for change and a shared vision to overcome resistance and ensure long-term success. Based on the evidence, we hypothesize that;

H1: Planning change directly influences e-procurement reforms.

Change Administration and E-procurement Reforms

Change administration in e-procurement reform requires clear communication (Kotter, 1995), stakeholder engagement (Freeman, 1984), training (Hiatt, 2006), and monitoring (Neely et al., 1994). Research has consistently shown that shaping a clear vision, fostering effective feedback systems, mobilizing commitment, and promoting teamwork are essential factors. Studies by Nani and Ali (2020)and Lee-Geiller and Lee (2019)emphasize the importance of vision shaping and feedback systems. Santa et al., (2019)found that mobilizing commitment and trust is crucial. Mergel et al., (2018)stress effective communication, while Ahimbisibwee et al., (2018) and Kyakulumbye et al., (2019) highlight teamwork. Kagoya and Mbamba (2021) advocate for reward systems. These factors are essential for successful electronic public sector reforms, underscoring the hypothesis that;

H2: Change administration directly affects e-procurement reform success

Solidifying change and E-Procurement reforms

Solidifying e-procurement reform requires reinforcing new behaviors (Kotter, 1995), cultural integration (Schein, 2010), continuous evaluation (Neely et al., 2002), and concern resolution (Hiatt, 2006), ensuring lasting benefits. A well-structured organization with consistent job descriptions is essential for sustaining change. Integrating change into daily operations—such as work schedules, supervision, and reporting—is also vital. Research has shown that monitoring activities before and after implementation is vital to ensure the sustainability of changes made (Ajibade & Mutula, 2019). Mutenyo et al.,'s (2022)study on African digitalization in Uganda emphasizes the importance of internalizing change. This integration into daily operations ensures that change becomes a standard task. Similarly, Nakakawa and Namagembe's (2019)research highlights the need for skilling after implementation to prevent system sabotage. Research supports the importance of continuous improvement in achieving long-term success. Veeramootoo et al. (2018) emphasize the need for periodic enhancements to meet evolving demands. By adopting a proactive approach to change management, we hypothesize that;

H3: Solidifying change has a direct influence on the success of e-procurement reforms.

Research on change management and e-procurement reforms reveals significant gaps, particularly in Sub-Saharan Africa, including Uganda. Existing studies focus on developed countries, neglecting unique regional challenges and opportunities (Al-Shammari, 2014; Weerakkody et al., 2016). Traditional change management frameworks, including those by Kotter (1995) and Lewin (1951), are often applied in Uganda without consideration for cultural and contextual nuances. Few studies provide quantitative data on change management's effect on e-procurement

reform success in Uganda (Neely et al., 2002). To address this, research should investigate how Ugandan cultural, social, and economic factors influence change management strategies and conduct empirical studies to measure the effect of change management on e-procurement reform success (Schein, 2010).

3. Methodology

By integrating quantitative and qualitative approaches, this mixed-method convergent design research (Bryman, 2016) aims to investigate the intricacies of change management and its effects on e-procurement reforms. A combination of purposive and random sampling techniques is employed. Purposive sampling selects 30 key informants, comprising public procurement officials, stakeholders, and experts in e-procurement reforms, for in-depth interviews. Random sampling selects 170 survey respondents from the PPDAA. Three data collection methods are employed: structured questionnaires were administered to 170 survey respondents, gathering quantitative data on demographics, change management practices, and e-procurement reform outcomes. 30 key informants participate, providing qualitative data on their experiences, perceptions, and insights on change management and e-procurement reforms. Relevant documents, including policy briefs, reports, and guidelines, are analyzed to provide contextual information on Uganda's procurement reforms.

To unravel the complexities of the research phenomenon, this study adopts a multifaceted data analysis approach, seamlessly integrating three distinct yet complementary methods (Creswell & Plano Clark, 2011). This integrative framework combines the strengths of descriptive statistics, inferential statistics, and thematic analysis to provide a nuanced and comprehensive understanding of the research findings. The quantitative component of the study employs descriptive statistics to summarize and describe the questionnaire data, utilizing frequency distribution to elucidate data distribution patterns, means to calculate central tendency, and standard deviations to assess data variability. Furthermore, inferential statistics are employed to examine relationships and dependencies between variables, leveraging regression analysis to model complex relationships, and correlation coefficients to measure variable associations. To uncover patterns, themes, and meanings within the qualitative interview data, a thematic analysis is conducted. This involved identifying and coding recurrent themes, interpreting meanings and underlying concepts, and contextualizing findings within the research framework (Patton, 2002). To ensure reliability and validity, the questionnaire is pilot-tested with 20 respondents. To ensure validity and reliability, expert reviewers assess the questionnaire and interview guide, while triangulation of multiple data sources and methods confirms the findings. Ethical integrity is maintained through informed consent, confidentiality, and anonymity for all participants and survey respondents.

Results

This section presents descriptive and inferential analyses of the study's findings. Descriptive analysis profiles socio-demographic characteristics and study variables, providing contextual insight into Ugandan e-procurement reform respondents. Inferential analysis using correlation and regression examines the relationships between change management strategies and e-procurement reform efficiency, informing evidence-based recommendations. These integrated findings inform strategic decision-making.

Socio-demographic information

The research concentrated on the employees of Uganda's PPDAA, taking them as the main unit of observation. The demographic characteristics of these respondents, including gender, age, educational level, employment terms, job roles, and tenure, are presented in Table 1 below. This demographic data provides essential context for understanding the study's findings and insights.

Table 1: Demographic Analysis of Survey Respondents

Demographic items	Categories	Frequency	Percentage
Gender	Male	92	54.1
	Female	78	45.9
Age	20-29 years	23	13.5
	30-39 years	95	55.9
	40-49 years	39	22.9
	Above 50 years	13	7.6
Education level	Bachelor’s degree	68	40.0

	Post Grad Diploma	28	16.5
	Masters' degree	65	38.2
	Doctorate	02	1.2
	Others	07	4.1
Employment terms	Contract	89	52.4
	Temporary	17	10.0
	Permanent	64	37.6
Role in the procurement process	Accounting officer	1	0.6
	Contracts Committee members	5	2.9
	PDU Officers	24	14.1
	Heads of User Departments	10	5.9
	Evaluation Committee members	10	3.9
	PPDA Prequalified service providers	120	70.6

Table 1 reveals a majority male representation (54%) among respondents, compared to 46% female. This gender distribution suggests fair sampling and implies higher male participation in research. These findings are relevant to assessing change management's effect on e-procurement reforms in Uganda. The study's demographic analysis shows that 56% of respondents were aged 30-39, 23% were aged 40-49, 14% were aged 20-29, and 8% were aged 50 and above, indicating a diverse age range among participants. Despite variations in age distribution, the sample's diversity across all age groups supports its fair selection. The study's educational level breakdown reveals that 40% of respondents held a bachelor's degree, 38% held a master's degree, 17% held a postgraduate diploma, 4% held other qualifications like CIPS, and 1% held a doctorate. Despite variations in educational levels, the findings indicate that all educational levels were represented, ensuring a knowledgeable and capable respondent pool. This diversity supports the study's reliability and validity in assessing the effects of change management on e-procurement reforms in Uganda. The employment terms distribution reveals: 52% contract workers, 38% permanent employees, and 10% temporary workers. This diversity supports fair sample selection, representing various terms of service in the population. The procurement process roles revealed that the majority of respondents (71%) were PPDA-prequalified service providers, followed by procurement and disposal unit officers (14%), and smaller percentages of Heads of User Departments and Evaluation Committee members (6%), Contracts Committee members (3%), and accounting officers (0.6%). This distribution ensures a reliable and well-rounded representation of various roles in the study, supporting the validity of the findings on the effects of change management on e-procurement reforms in Uganda.

Descriptive findings on the study variables

Change management (an independent variable) was assessed via planning, administration, and solidification. E-procurement reforms (dependent variable) were evaluated based on efficiency, cycle time, value, and accountability. A 5-point Likert scale was used. Mean and standard deviation analyses indicated agreement (mean > 3) or disagreement (mean < 3), with standard deviations near 1 showing consensus and near 0 showing dissent.

Change management- Planning change

To elucidate the planning change dynamics in Uganda's e-procurement reform process, respondents evaluated the effectiveness of their organization's planning process for e-procurement reforms. The findings are presented in Table 2 below.

Table 2: Responses on Planning change

Item	Mean	Std. Deviation
We first made sure that the majority of staff shared the need to have e-GP introduced in the procurement process	4.59	1.352
We first made sure that the majority of staff shared the same vision towards what e-GP could do before it was introduced in the procurement process	4.59	1.361
During the planning of e-GP, adequate resources were availed as required in the successful implementation	4.53	1.279
We ensured that management support was developed throughout user departments	4.61	1.256
The change agents were adequately trained to ensure that they are fit to implement e-GP	4.74	1.223
The change agents were able to adequately deal with resistance directly and indirectly	4.47	1.241

Table 2 shows that respondents overwhelmingly agreed on the necessity of introducing e-GP in the procurement process, with a mean score of 4.59 (SD = 1.352). This indicates that respondents had a clear understanding of e-GP. The findings suggest that staff shared a unified vision for e-GP's potential benefits before its introduction, supported by a strong mean score of 4.59 (SD = 1.361), highlighting a consensus among respondents regarding e-GP's value." Respondents agreed that sufficient resources were made available for e-GP implementation during the planning stage, with a mean score of 4.53 (SD = 1.279). This confirms that adequate resources were allocated for successful implementation [1]. Additionally, respondents agreed that management support was established across user departments, with a mean value of 4.6 (SD = 1.256), indicating strong management backing for e-GP adoption. Respondents confirmed that change agents received adequate training for e-GP implementation, with a mean value of 4.74 (SD = 1.223), indicating a high level of preparedness. Furthermore, change agents effectively managed resistance to system implementation, with a mean value of 4.47 (SD = 1.241), demonstrating their ability to handle both direct and indirect opposition. The findings conclusively demonstrate that change agents possessed the necessary skills and knowledge to effectively facilitate the successful implementation of e-GPTo further validate the quantitative findings, we conducted in-depth interviews with respondents. This included an interview with a procurement and disposal unit officer, who shared their insights and provided qualitative feedback that corroborated the earlier results. As stated by an individual in the study; "PPDA has had training programs and capacity-building initiatives for the workforce and stakeholders. There are adequate financial resources; PPDA has invested in the necessary technology and infrastructure upgrades, such as modern e-procurement systems".

The PPDA proactively established comprehensive planning processes, enabling a seamless transition to the electronic procurement system. This development significantly contributes to Uganda's public procurement reform agenda, aiming to enhance transparency, efficiency, and accountability in government procurement processes. Through a detailed and inclusive planning process, the PPDA managed to engage stakeholders, determine needs, and establish essential infrastructure, paving the way for a seamless transition to the electronic procurement system and ensuring its effective integration. This reform agenda is a crucial step towards streamlining procurement processes, reducing corruption, and promoting economic growth in Uganda.

Change management: change administration

The effectiveness of management's communication and stakeholder engagement during e-procurement reform implementation is summarized in Table 3.

Table 3: Responses on Change Administration

Items	Mean	Std. Deviation
We have endeavoured to invest in training employees towards the need to fully use the e-GP in the procurement process	4.64	1.262
There is a clear feedback management system to deal with any form of complaint or resistance in time about e-GP	4.52	1.315
Commitment in members is mobilizing by leaders in user departments	4.58	1.258
Communication on how to use e-GP was adequately done upward, downward and laterally	4.49	1.347
Adequate financial rewards are provided to those who observe e-GP implementation at all levels	4.08	1.325
Adequate non-financial rewards are provided to those who observe e-GP implementation at all levels	4.12	1.336

Table 3 shows that a significant majority of respondents (mean value: 4.64, SD: 1.262) acknowledged that their organization has invested in training employees to maximize the use of e-GP in procurement processes. Additionally, respondents confirmed (mean score: 4.52, SD: 1.315) that a robust feedback management system is in place to address complaints and resistance related to e-GP promptly. Feedback mechanisms are actively utilized to drive impactful changes and enhancements, as evidenced by the results. The table further shows that leaders in user departments have successfully mobilized member commitment (mean value: 4.58, SD: 1.258). The survey findings reveal that respondents slightly agree that adequate financial (mean score: 4.08, SD: 1.325) and non-financial (mean value: 4.12, SD: 1.336) rewards are provided to individuals who observe e-GP implementation at all levels. This suggests a comprehensive approach to motivating e-GP users, leveraging both financial and non-financial incentives to enhance user motivation and adoption. The qualitative data provided further insight into the quantitative findings, confirming that the PPDA had offered a combination of financial and non-financial rewards to individuals contributing to e-GP implementation at all levels. Respondents' testimonials provided rich context, highlighting the effectiveness of these rewards in motivating stakeholders. The following quotes capture respondents' perspectives;

Our department offered us a training allowance after completing specific e-procurement system training courses. Suppliers with a history of on-time delivery, quality products, and adherence to contract terms through the e-procurement system may receive priority consideration in future bids or access to exclusive business opportunities. The government announced an early adoption bonus for procurement officials who actively start using the e-procurement system within the first three months of its launch.

The results confirm that a well-managed change process was executed, resulting in the successful implementation and outcomes of the electronic procurement system at PPDA.

Change management- solidifying change

The analysis presented in Table 4 highlights the sustained adoption of e-procurement reforms in PPDA's day-to-day operations.

Table 4: Responses on Solidifying change

Items	Mean	Std. Deviation
e-GP is well integrated into our organizational chart	4.43	1.455
Jobs for the implementation team are well-defined	4.62	1.221
There is a clear job description for the team behind the implementation of e-GP	4.66	1.296
e-GP has been institutionalized in the process of procurement in PDEs and PDUs	4.49	1.316
Employees in user departments have been skilled in propagating e-GP	4.47	1.355
A continuous improvement strategy for e-GP is in place.	4.78	1.239

The results in Table 4 indicate that respondents slightly agreed on the integration of e-GP into the organization's structure (mean score: 4.43, SD: 1.455). However, they showed stronger agreement on the clarity of roles and responsibilities within the implementation team (mean score: 4.62, SD: 1.221) and the presence of clear job descriptions (mean score: 4.66, SD: 1.221). This suggests that team members have well-defined tasks, supporting the successful implementation of e-GP. Respondents confirmed that e-GP has been successfully institutionalized in the procurement processes of PDEs and PDUs, with a mean score of 4.49 (SD = 1.316). Additionally, they agreed that employees in user departments have received adequate training in e-GP, with a mean score of 4.47 (SD = 1.355). This suggests that sufficient training has been provided to e-GP users across various departments. Furthermore, the majority of respondents agreed that a continuous improvement strategy for e-GP is in place, with a mean score of 4.78 (SD = 1.239). This indicates that e-GP has been fully integrated and will continue to be developed and improved. We pursued in-depth interviews with respondents to corroborate the quantitative data and elicit detailed feedback. Respondents expressed that; "Employees in user departments have been trained and equipped with the necessary skills to effectively promote and advocate for the adoption of an e-procurement system in all government department".

PPDA is taking decisive steps to solidify change in its project activities, making deployment and usage more efficient. Thus, by streamlining project activities, PPDA may be better positioned to scale its operations and take on new challenges.

E-procurement reforms

Employees evaluated the impact of e-procurement reforms on procurement process effectiveness within their organizations. The findings are summarized in Table 5.

Table 5: Responses on E-procurement reforms

Item	Mean	Std. Deviation
e-GP has been able to achieve timeliness in our purchases	4.49	1.288
e-GP has been able to reduce on the cost in our procurement process	4.80	1.248
Procurement cycle time has been minimized by e-GP	4.72	1.238
e-GP has maximized the value for money in the procurement process	4.62	1.288
e-GP has improved the process of meeting accountability requirements	4.79	1.161

The data in Table 5 reveals that respondents strongly agree that e-GP has enhanced purchase timeliness, with a mean score of 4.49 (SD = 1.288). Additionally, respondents affirm that e-GP has effectively reduced procurement costs, with a mean score of 4.80 (SD = 1.248). These findings demonstrate that e-GP has successfully optimized the procurement process, leading to substantial cost reductions. The survey results show that respondents overwhelmingly agreed that e-GP has reduced procurement cycle time, with a mean score of 4.72 (SD = 1.238). They also confirmed that e-GP has achieved significant value for money, with a mean score of 4.62 (SD = 1.288), indicating effective value addition. Moreover, respondents agreed that e-GP has strengthened accountability, with a mean score of 4.79 (SD = 1.161), demonstrating robust accountability mechanisms. These findings collectively demonstrate that e-GP has had a profoundly positive impact on procurement processes. The finding that e-GP has achieved significant value for money in the procurement process is further supported by the Accounting Officer at PPDA, who expressed a similar view during an interview, stating:

The adoption of e-procurement has been a significant milestone in our efforts to streamline procurement processes and enhance efficiency through automating tasks like supplier registration, bid submission, evaluation, and contract management. Consequently, this has resulted in substantial time savings for equally procurement professionals and suppliers, ultimately shortening the procurement cycle. Moreover, automation has alleviated the need for extensive paperwork, resulting in cost savings related to printing, storage, and document management.

The recent reforms have significantly boosted the efficiency and accountability of Uganda's public procurement system, aligning perfectly with the Public Procurement and Disposal of Public Assets Authority's (PPDA) mission. By streamlining processes and increasing transparency, these reforms have enabled the public procurement system to deliver services promptly and at a lower cost. This transformation is particularly important in the digital era, where countries are capitalizing on technology to enhance public procurement systems, achieving efficiency gains of up to 20% in cost and 80% in time. Effective public procurement systems are crucial for achieving national development objectives, including improved public service delivery, human capital

development, and private sector growth. This has been achieved through integrating e-Government Procurement (e-GP) and the Public Procurement and Disposal of Public Assets Act, which have increased transparency and accountability in the procurement process. The reforms have also aligned with the PPDA's mission to regulate public procurement and disposal of public assets in Uganda, promoting accountability and transparency in the use of public funds.

Correlation analysis

Correlation analysis measures empirical connections between variables but does not imply causation (Hair et al., 2010). This study utilized bivariate correlation analysis through the Pearson correlation matrix to examine variable interrelationships. The results are presented in Table 6.

Table 6: Correlation matrix of the Study variables

		E-procurement reforms	Planning change	Change management	Solidifying change
E-procurement reforms	Pearson Correlation	1	.742**	. 673**	.741**
	Sig. (2-tailed)		.000	.000	.000
	N	170	170	170	170
Planning Change	Pearson Correlation	.742**	1	.483**	.370**
	Sig. (2-tailed)	.000		.000	.000
	N	170	170	170	170
Change administration	Pearson Correlation	.673**	.483**	1	.562**
	Sig. (2-tailed)	.000	.000		.000
	N	170	170	170	170
Solidifying change	Pearson Correlation	.741**	.370**	.562**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	170	170	170	170
**. Correlation is significant at the 0.01 level (2-tailed).					

Table 6 presents the correlation analysis results, illustrating the strength and direction of relationships between study variables. A significant positive correlation exists between planning change and e-procurement reforms (r = 0.742**, p = 0.000), exceeding the 0.05 significance threshold. This finding indicates that planning change substantially contributes to the success of e-procurement reforms within the Public Procurement and Disposal of Public Assets Authority. Consequently, the null hypothesis is rejected in favour of alternative Hypothesis 1, confirming that planning change directly influences e-procurement reform success. Table 6 reveals a significant positive correlation between change administration and e-procurement reforms (r = 0.673**, p = 0.000), surpassing the 0.05 significance threshold. This finding confirms that effective change administration substantially contributes to e-procurement reform success within the Public Procurement and Disposal of Public Assets Authority. Therefore, Hypothesis 2, stating that change administration directly influences e-procurement reform success, is supported. Table 6 demonstrates a strong and significant correlation between solidifying change and e-procurement reform success (r = 0.741**, p = 0.000), significant at the 0.01 level. The correlation indicates a direct relationship: higher ratings of solidifying change are associated with higher ratings of e-procurement reform success, and vice versa. These findings confirm that effective solidification of change contributes to e-procurement reform success, supporting Hypothesis 3. The independent variables demonstrate a strong interrelationship, as evidenced by correlation coefficients exceeding 0.05. Specifically, planning change and e-procurement reforms show a significant positive correlation (r = 0.742**, p = 0.000), as do change administration and e-procurement reform (r = 0.673**, p = 0.000), and solidifying change and e-procurement reform (r = 0.741**, p = 0.000). These findings support this study, underscoring the critical role of effective change management in successful e-procurement reform implementation.

Multiple regression analysis

A multiple regression analysis investigated the combined impact of planning change, change administration, and solidifying change on e-procurement reform. Key findings are summarized in three tables: Table 7 (Model Summary), Table 8 (ANOVA Table), and Table 9 (Regression Coefficients Table).

Table 7: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.741[a]	0.549	0.542	0.75346	0.549	74.717	3	184	.000

a. Predictors: (Constant), Planning change, change administration and solidifying change

Table 7 presents the regression model's goodness of fit, indicating a strong relationship between e-procurement reform and its predictors. Specifically, the model yields an R-value of 0.741, an R2 of 0.549, and an adjusted R2 of 0.542. Approximately 54.2% of the variation in e-procurement reform is attributable to planning change, change administration, and solidifying change, demonstrating a robust association. The R2 value of 0.549 surpasses the recommended 0.4 threshold, indicating a well-fitting model.

The results of the Analysis of Variance (ANOVA) test, conducted using SPSS, are reported in Table 8.

Table 8: ANOVAa results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	127.250	3	42.417	74.717	.000[b]
	Residual	104.456	184	0.568		
	Total	231.706	187			

a. Dependent Variable: e-Procurement reform

b. Predictors: (Constant), Planning change, change administration, solidifying change.

Table 8 presents the ANOVA results, revealing a statistically significant effect ($F = 74.717$, $p < 0.001$). This confirms the model's fitness and indicates that the independent variables—planning change, change administration, and solidifying change—significantly contribute to successful e-procurement reform in the Public Procurement and Disposal of Public Assets Authority.

Table 9: Coefficient results

Table 9 displays the regression analysis results, exploring the interrelationships between planning change, change administration, and solidifying change in e-procurement reform concerning direction, strength, and statistical significance.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.969	.265		3.652	.000	0.306	1.390
	Planning Change	.810	.056	.742	14.331	.000	0.219	0.675
	Change administration	.725	.061	.673	11.804	.000	-0.162	0.189
	Solidifying Change	.726	.051	.741	14.301	.000	0.245	0.584

a. Dependent Variable: e-Procurement reforms

Table 9 reveals that the independent variables—planning change ($\beta = 0.810$, $p < 0.05$), change administration ($\beta = 0.725$, $p < 0.01$), and solidifying change ($\beta = 0.726$, $p < 0.01$)—all significantly impacted e-procurement reform at the Public Procurement and Disposal of Public Asset Authority. The corresponding standard errors are 0.000, 0.000, and 0.000, respectively. Based on these results, the multiple regression equation for the study is;

$Y = -0.810 + 0.725X1 + 0.013X2 + 0.726X3$

Where;

y= e-procurement reforms
X1= planning change
X2= change administration
X3= solidifying change.

Our multiple regression analysis yielded significant findings: Planning change positively impacts e-procurement reform ($\beta = 0.810$, $p < 0.05$), supporting H1. Each unit increase in planning change yields a corresponding 0.810-unit improvement. Change administration significantly enhances e-procurement reform efficiency ($\beta = 0.725$, $p < 0.05$), validating H2. A one-unit increase in change administration results in a 0.725-unit efficiency improvement. Contrary to H3, solidifying change exhibits a robust positive relationship with e-procurement reform ($\beta = 0.726$, $p < 0.05$). Specifically, a one-unit increase in solidifying change corresponds to a 0.726-unit reform improvement.

Discussion

This study investigates the impact of change management on e-procurement reform success in Uganda, using the Public Procurement and Disposal of Public Assets Authority (PPDAA) as a case study. We examined three key dimensions of change management—planning change, change administration, and solidifying change—and their relationships with e-procurement reforms. Our findings conclusively show that effective change management significantly enhances e-procurement reform success. Research has shown that effective change management is crucial for successful e-procurement reforms. A study by Matunga et al. (2013) found that e-procurement significantly improves procurement efficiency in public hospitals, particularly when using e-tendering, e-quotations, and e-sourcing. However, challenges arise when using e-market providers, including inadequate funding, poor change management, and insufficient employee training. Similarly, Rotich and Okello's study (2015) revealed a positive correlation between e-procurement and supply chain performance in Kenyan county governments. Yet, the success of e-procurement reforms relies on factors such as supplier engagement, risk mitigation, process streamlining, expert consultation, and strategic software selection, as outlined by Basheka et al. (2012)In a study focused on Uganda's public sector, specifically the implementation of e-procurement systems. Consistent with existing research, our findings highlight the pivotal role of planning change in driving successful e-procurement reforms. Effective change management and strategic consideration of critical factors empower organizations to maximize e-procurement benefits and streamline procurement processes.

Consistent with Lewin's Change Management Model, our study validates the pivotal role of planning change (the freezing stage) in driving successful e-procurement reforms. This finding aligns with Neupane et al.'s (2014) research, which established a robust link between effective change planning and successful e-procurement reform implementation (refreezing stage). In Rwanda, Gakuru's 2022 study revealed that three district hospitals successfully implemented e-procurement by equipping staff with necessary skills, driven by statutory requirements for online procurements. These institutions extensively adopted e-requisition, supplier selection, e-tendering, tender evaluation, supplier relationship management, and procurement record management. Similarly, Maepa et al.'s 2023 study identified six factors influencing e-procurement readiness in South African government departments, including technology and organizational finance, to inform effective planning. Svidronova and Mikus's 2015study in Slovakia demonstrated that e-procurement streamlines the procurement process, encompassing search, sourcing, negotiation, ordering, receipt, and post-purchase review, leveraging ICT-driven innovations. Research by Chen et al. (2022) reveals that centralized governance structures facilitate e-procurement adoption in local governments, enabling them to manage increasing procurement complexity. In contrast, coordinated structures hinder e-procurement adoption, as existing intra-organizational collaboration and information-sharing mechanisms suffice for complex procurements. Similarly, Mwihaki's (2018) study found that staff competency, top management support, and procurement planning significantly enhance procurement performance. Although e-procurement technology shows a positive correlation, its impact on procurement performance is statistically insignificant. The research underscores the interplay between organizational structure, human capital, strategic planning, technology, and skills in determining e-procurement success. These factors are vital for optimizing e-procurement implementation and procurement performance across various settings.

Our research underscores the vital importance of effective change administration in driving successful e-procurement reforms, particularly during the changing stage of Lewin's model. This finding substantiates our second hypothesis, emphasizing the need for meticulous management of the transformation process. Our results resonate with the findings of Aman and Kasimin (2011), who identified significant hurdles in e-procurement implementation. These challenges include complex legal and administrative procedures, inadequate IT infrastructure, outsourcing contracts, and insufficient IT skills. Notably, their study highlights the necessity of establishing IT facilities centers in rural areas and collaborating with third-party vendors to provide user training and skills development. Rizki's (2018) study highlights two key e-procurement implementation challenges: system specification (software integration, data management, legal and administrative procedures, and IT infrastructure) and implementation management (roll-out strategy and IT skills). The study also reveals significant impacts on the total cost of acquisition, organizational characteristics, and governance structure. Implementing an integrated system and centralized database can mitigate these challenges. McCue and Roma (2012)identify four critical barriers to successful e-procurement implementation: software platform incompatibility, organizational resistance, lack of strategic systems integration, and limited procurement professional involvement in system design. Addressing these challenges is crucial for optimizing digital procurement outcomes. These insights offer valuable guidance for navigating the changing stage of Lewin's change management model. Organizations can navigate the challenges and achieve a successful refreezing stage by adopting proactive measures and addressing the previously highlighted obstacles. At this stage, e-procurement reforms become institutionalized, leading to sustainable and lasting benefits. Effective change administration is crucial in this context, enabling organizations to overcome implementation barriers and harness the full potential of e-procurement reforms. Our study reinforces the importance of integrating change management principles into e-procurement initiatives, paving the way for successful and enduring transformations.

The findings of our study reaffirm the importance of Lewin's change management model in achieving successful e-procurement transformation. Specifically, our findings underscore the critical importance of the refreezing stage, where solidified changes yield lasting benefits. This critical stage drives e-procurement reform, yielding significant enhancements in organizational performance. Tutu et al.'s (2019) research on e-procurement systems supports our findings, emphasizing the vital role of effective change management in ensuring integration, efficiency, and long-term viability. A systematic change management strategy enables organizations to revolutionize their procurement processes, leading to peak performance. Muriithi and Senelwa (2018)examined e-procurement adoption factors. Management factors exerted the most significant impact, surpassing environmental, technological, and organizational factors in influence. Strategic budget allocation, staff training, vendor support, and ICT policy reinforcement emerged as crucial elements for effective e-procurement adoption, warranting priority consideration. Yuen and Calvin Cheng (2023) explored sustainable e-procurement practices, identifying operational efficiency, cost-effectiveness, and employee acknowledgment as key adoption drivers. However, the pandemic presents challenges, including adapting to new suppliers and overcoming barriers to remote collaboration. Lewin's refreezing stage is vital for institutionalizing and sustaining e-procurement reforms. By solidifying changes, organizations can lock in gains, prevent regression, and foster a culture of continuous improvement. Our study and Tutu et al.'s (2019) research collectively emphasize the significance of strategic change management in harnessing the full potential of e-procurement reforms.

Conclusion

This study investigated the impact of change management on e-procurement reforms in Uganda, shedding light on the critical factors influencing successful implementation. The research unequivocally establishes that planning, administering, and solidifying change are essential components of effective e-procurement reform strategies. Effective change management strategies can mitigate resistance, ensure seamless integration, and increase efficiency in e-procurement systems.

Implications for Policy and Practice

Policymakers should prioritize comprehensive change management frameworks to support e-procurement reforms. Procurement entities should invest in training and capacity-building programs to equip staff with the necessary skills for effective e-procurement management.

Recommendations for Future Research

Future studies should explore technological advancements in enhancing e-procurement systems and investigate change management's impact on e-procurement outcomes in other sectors. Researchers should also examine the effectiveness of different change management models in various Ugandan contexts.

This study contributes to understanding change management's significance in e-procurement reforms in Uganda. By adopting effective change management strategies, Uganda can optimize its e-procurement systems, promote transparency, and improve public financial management. The findings inform policy and practice, guiding future research and fostering collaboration between researchers, practitioners, and policymakers

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