SOCIAL SCIENCE REVIEW ARCHIVES
ISSN Online: 3006-4708
ISSN Print: 3006-4694
https://policyjournalofms.com

Enhancing Efficiency, Transparency, Fairness, Competition and Obtaining Best Value for Money Through the Implementation of an E-Procurement Management System for Public Sector and PSDP/Donor Funded Projects in Gilgit Baltistan

Abbas Ali[1], Arif Hussain[2], Tahir Ali[3], Muhammad Hussain[4], Mubashir Hassan[5], Shahid Hussain[6]

[1] Assistant Registrar University of Baltistan, Skardu, Corresponding Author, abbas.4u@hotmail.com
[2] M. Phil. Department of Mass Communication, Govt. College University Faisalabad, arifsqi6@gmail.com
[3] Lecturer English (Education Fellow), Govt. Shaheed Benazir Bhutto Inter College, Gamba Skardu, tahirwazirbalti786@gmail.com
[4] Divisional Operation Manager, Gilgit Baltistan Rural Support Programme, hussainskd@outlook.com
[5] MS Scholar, Department of Project Management, Karakorum International University, Gilgit, mubashir.gis@gmail.com
[6] MS Construction Engineering & Management NUST Islamabad, shahid_gh5@yahoo.com

DOI: https://doi.org/10.70670/sra.v3i1.320

Abstract

This study aims to conduct a comprehensive analysis of the public procurement system in Pakistan, with a specific focus on exploring electronic/online procurement methods that can improve transparency in public sector and Public Sector Development Programme (PSDP)/donor organizations in Gilgit Baltistan. The research adopts a two-pronged approach: firstly, providing an overview of the existing procurement landscape in Pakistan, and secondly, proposing innovative strategies to implement a transparent electronic procurement system. Drawing from a diverse array of sources such as publications, journal articles, government documents, regulations, laws, news articles, webpages, and a relevant dissertation, this study goes beyond national boundaries by examining procurement experiences in other countries. By doing so, it aims to glean valuable insights and lessons that could contribute to enhancing Pakistan's public procurement system. Employing a conceptual analysis technique, this research extensively examines current trends and progress in procurement practices within Pakistan's public sector. The findings of this study make a substantial contribution to understanding the strengths and areas requiring improvement in the public procurement system. Furthermore, the proposed electronic procurement system, informed by international experiences, offers a pragmatic solution to enhance Efficiency, Transparency, Fairness, and Competition. It strives to achieve the best value for money in both the public sector and donor-funded projects in the Gilgit Baltistan province.

Key words: Efficiency, Transparency, Fairness, Competition, best value for money, E Procurement

Introduction

Public procurement refers to the process by which government entities acquire goods, services, or works from external sources. It involves a series of activities, from identifying needs and specifying requirements to the actual purchase and delivery of the goods or services. Public procurement is a critical function for governments at various levels, as it allows them to obtain the necessary resources to fulfill their responsibilities and provide public services. Public procurement processes are typically governed by laws and regulations to promote fairness, competition, and efficiency. These regulations may vary across jurisdictions but often aim to prevent corruption, ensure equal opportunities for suppliers, and achieve value for money in the use of public funds. The governance of procurement plays a crucial role in fostering public trust in government and serves as a barometer for the quality of public administration. As a result, it becomes a priority area for strengthening in most governments. Public procurement serves as a crucial aspect of public administration, acting as a vital link between the public financial system and social and economic outcomes. It plays a significant role in determining the quality of community services, infrastructure, and overall government effectiveness. This function encompasses various areas, including planning, program management, and budgeting.

Different research shows:

- Government procurement accounts for a substantial proportion of Gross Domestic Product (15-20% or more in most countries) (Margaret Liang 2007)
- Public procurement, in one form or another, accounts for 70% of government expenditure in developing countries. (OECD 2011)

It has also been recognized by the OECD (2007) that "public procurement is the government activity most vulnerable to waste, fraud *and corruption due to its complexity, the size of the financial flows it generates and the close interaction between the public and the private sectors*". In developing countries, the execution of development work often encounters challenges due to the absence of efficient, transparent, and cost-effective project management systems. Traditional governance structures contribute to prolonged decision-making processes, increasing the likelihood of corruption and misuse, and the lack of real-time monitoring systems. Additionally, policy support for procurement and contract management is often overlooked in project management, particularly in developing countries such as Pakistan. In Pakistan, the Public Procurement Regulatory Authority (PPRA) is responsible for overseeing public procurement (Zaidi et al., 2019). Established under the Public Procurement Regulatory Authority Law 2002, the PPRA has the mandate to formulate rules and procedures for public sector organizations' procurements. The Public Procurement Regulations were introduced and implemented in 2004, with the aim of promoting transparency, fairness to suppliers, and accountability in public sector procurement. Despite having established procurement regulations, the PPRA has not yet formulated regulations for sustainable public purchases (Zaidi et al., 2019). In Pakistan the public sector, excluding interest payments and defence, accounts for approximately 10% of GDP. This represents approximately PKR 2300 billion for the 2013/14 financial year. Of this, about 30% is for non-salaries and wages. As a result of the introduction of e-Procurement, different countries have reported substantial savings ranging from 5-30% of public expenditure in public procurement. Even if it is assumed only 1% saving were made for Pakistan, this would mean approximately PKR 7000 million per year could be saved. Gilgit Baltistan is among the remote province of GB, with the limited resources and institutional capacity to manage mega project and Programme especially in public sector. The Gilgit Baltistan Cabinet approved the GB PPRA in 2022 and make it in enforcement from 2022. The Government of Pakistan, International Fund for Agricultural Development (IFAD) and Italian Agency for Development Cooperation (AICS) has signed a Financing Agreement for the execution of Economic Transformation Initiative Gilgit Baltistan (ETI-GB). The Economic Transformation Initiatives Gilgit Baltistan is project aims to

catalyze sustainable economic growth, improve livelihoods, and foster community development in the region. To achieve these objectives, it is imperative to streamline and modernize the procurement processes through the implementation of an E-Procurement Management System. This digital solution will not only enhance efficiency but also ensure transparency in the acquisition of goods and services, contributing to the overall success of the project as well will demonstrate replicable management model for the Public sector department of Gilgit Baltistan.

Background

The Government of Pakistan, International Fund for Agricultural Development (IFAD) and Italian Agency for Development Cooperation (AICS) has signed a Financing Agreement for the execution of Economic Transformation Initiative Gilgit Baltistan (ETI-GB). The Programme goal and objectives are as follows: Programme Goal and Objectives: The goal is improved incomes and reduced poverty and malnutrition in rural areas of Gilgit-Baltistan region benefitting around 100,000 rural households while the objective is substantial increase in irrigated crop area and production and improved connectivity with markets through strategic investments in economic infrastructure by using community led development approach. The Programme consists of the following three main components: (1) Economic Infrastructure for Value Chain Development involving development of irrigation infrastructure, land distribution and entitlement and development and farm to market roads of in Gilgit Baltistan (2) Support Services/PPPP for Value Chain Development: The component revolves around a commercial and market-oriented production and value addition by organized groups of farmers and other value chain players, and (3) focuses on Programme management and policy/institutional support. Public funds play a crucial role in driving the growth and development of any country, while also enabling the achievement of the goals and objectives set by donors. It is worth noting that a significant portion (over 70%) of project funds are allocated through the procurement process. Procurement policy regulates the public sector's interactions with domestic and international markets in ways that directly impact national efficiency and competitiveness. Public procurement is a common vehicle for business and industry development policies, and most regional and bilateral trade agreements have significant provisions aimed at granting reciprocal access to domestic government procurement markets. Poor management of procurement invariably reduces development outcomes and is likely to reduce foreign direct investment. These effects have already been reported by the International Monetary Fund (Davoodi 1998), which has identified national consequences for low- and middle-income countries in terms of (i) over-spending on capital, (ii) under spending on asset maintenance, (iii) poor quality infrastructure, and (iv) reduced government revenues. The IMF study concluded that poor governance of procurement can result in infrastructure that reduces national growth - investment becomes a disinvestment. The poor quality and under-spending on maintenance also implies that what infrastructure exits has lower economic productivity. For these reasons, the strengthening governance in procurement has been described as the single most significant option for development in many countries. However, the success of these initiatives is contingent upon the establishment of efficient and transparent procurement systems. Traditional procurement processes often face challenges such as delays, paperwork bottlenecks, and the risk of corruption. Recognizing these challenges, it is necessary to initiate a transition towards a digital procurement management system that can mitigate these issues and propel the economic transformation initiatives forward. This system aims to optimize the utilization of public funds, which play a pivotal role in the growth and development of any country, as well as achieve the goals and objectives of donors. Currently, ETI-GB is utilizing an e-procurement process to obtain No Objection from IFAD through No Objection Tracking Utility System (NOTUS) and Online Project Procurement End to End System (OPEN) platforms, which are used for creating and updating of procurement planning on the portal. Unfortunately, these

portals are not currently integrated with the procurement processes involving economic operators. At present, we only share the bidding documents with economic operators through email. ETI-GB, being an agricultural development project, heavily relies on seasonal agricultural activities. In order for these activities to be successful, it is imperative that the procurement process is executed effectively and efficiently, and that economic operators come on board in a timely manner. Failing to do so would render the entire procurement process useless, making it extremely challenging to achieve the project's goals and objectives within the designated timeline. Hence, it is crucial for the project to embrace e-procurement as a means to ensure the timely completion of project activities.

Traditional Procurement

There are several weaknesses inherent in traditional procurement, including too much paperwork, repetitive orders, a need to manage many suppliers, less cooperation between users and procurement, tendencies to handle jobs with emergency processes, too many level approvals required, long processing times and potential collusion (Selamat et al 2007). The traditional procurement system requires employees to coordinate vast amounts of paperwork. This paperwork can include purchase orders, supplier acknowledgments, shipping and receiving documents, invoices and accounts payable vouchers, supplier payments and account reconciliation reports. The flow of this information is presented in Figure 1.

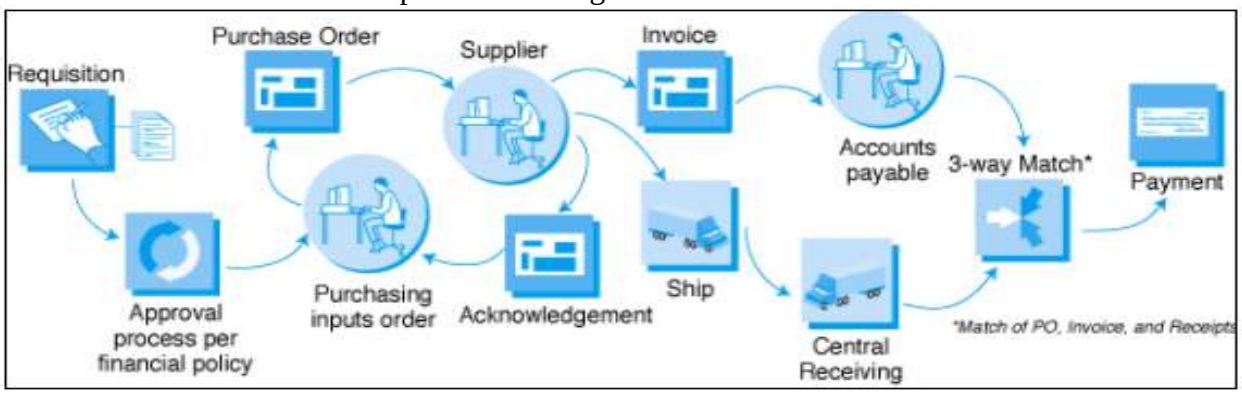

Figure 1. Traditional Procurement Process

The typical cycle time for traditional procurement is five and a half days (Chaffey, 2004). The conventional paper-based procurement processes suffer from several inherent problems, including inadequate management information, inefficiencies in procedures, elevated compliance costs for suppliers and departments, simplistic and subpar procurement methodologies, and a significant lack of transparency. The persistence of paper-based procurement hampers the adoption of efficient information technologies in the broader economy and is marked by:

- Uncoordinated purchasing across government entities, leading to different departments having disparate contracts and pricing for identical goods (ADB, 2013).
  - Different government departments procuring the same goods from different suppliers.
  - Lack of centralized procurement strategy leading to varied contracts and pricing for identical products.
- Substantial process costs linked to market testing.
  - High expenses associated with traditional methods of market testing, such as printing and distributing paper-based requests for proposals (RFPs).
  - Time-consuming manual processes for evaluating and comparing vendor responses, contributing to increased costs.
- Outdated market intelligence.
  - Reliance on historical data and limited real-time information about market trends.

- Inability to quickly adapt to changes in the market, resulting in suboptimal procurement decisions.
- Maverick spending, or off-contract purchases
- Instances where individual departments or employees make purchases outside the established contracts.
- Lack of oversight and control leading to higher costs, potential non-compliance, and difficulties in tracking spending.
- Inefficient payment processes.
- Paper-based invoices causing delays in processing and payments.
- Manual verification processes contributing to errors and longer payment cycles.
- Outmoded audit information.
- Difficulty in accessing and consolidating procurement data for audit purposes.
- Incomplete or outdated records hindering accurate and comprehensive audits of procurement activities.
- Error-prone tracking of contract management.
- Manual tracking systems leading to data entry errors and inaccuracies.
- Challenges in monitoring contract compliance and renewals due to lack of automated tracking mechanisms.

In this traditional setting, numerous opportunities for enhanced social and economic outcomes remain concealed due to the inaccessibility of pertinent management and planning information. Addressing these issues through the adoption of efficient information technologies and modernizing procurement processes such as e-procurement can help overcome these challenges and improve overall transparency, efficiency, and effectiveness in procurement activities.

International Experience

Traditional paper-based procurement processes suffer from various issues, including inadequate management information, inefficiency in procedures, high compliance costs for both suppliers and departments, simplistic and subpar procurement methodologies, and a lack of transparency. The persistence of paper-based methods also hinders the adoption of productive information technologies, leading to uncoordinated purchasing across government departments with varying contracts and prices for the same goods. The international experience with e-procurement rollout has been diverse, with some cases seeing rapid adoption while others face slow uptake or none at all. For instance, in Andre Pradesh, e-bidding was mandated and implemented abruptly without a transition period, whereas in Bangladesh, a gradual phase-in process over several years is currently underway. In Kazakhstan, an e-procurement system is being introduced incrementally based on individual functions, and Nepal is implementing a partial system. The European Union (EU) as a whole has been slow in developing and applying e-procurement compared to international standards. E-procurement features tend to be similar across countries, influenced by national laws, customs, supplier bases, and institutional arrangements. Many states in India have their own state-wide e-procurement systems with similar functionalities. In India, the Build-Own-Operate (BOO) model is commonly applied, while Malaysia initiated its ePeroleham e-procurement system in 2000 under the BOO model, involving a private company regulated by the Finance Ministry. The system encompasses various procurement methods, including quotation, open tendering, direct purchase from catalogues, and reverse auctions, with 75% of public agencies adopting the system. A crucial lesson learned from national developments is that e-procurement is more than just a software application; approaching it solely from a technological standpoint may not lead to a successful outcome. It's uncommon for an e-procurement system developed for one jurisdiction to be seamlessly adopted without modification by another.

Public Procurement in Gilgit Baltistan, Pakistan

Before delving into the intricacies of the public procurement process, it is crucial to grasp the legislative landscape governing public procurement in the Gilgit Baltistan province. The foundation of Pakistan's legislative system is laid out in the Constitution of 1973. However, it is noteworthy that this constitution does not explicitly address public procurement matters, and neither federal nor provincial laws are specifically tailored to regulate this domain. Instead, the oversight of public procurement in Pakistan is managed through a subsidiary legal and regulatory framework. The evolution of the public procurement system in Pakistan has traversed various state to attain its current form:

i. **Purchase Manual 1947:** Initially, the purchase manual governed the procurement of commodities falling within nine categories, particularly those acquired by foreign-funded projects. Despite its early role, the purchase manual exhibited several shortcomings when compared to the contemporary procurement rules.

ii. **West Pakistan Building & Roads Department Code 1960:** Infrastructure developments and the engagement of experts were subject to the governance of the West Pakistan Building & Roads Department Code. This code laid down the guidelines for such aspects of public procurement.

iii. **General Financial Rule (GFR) 1951 and 1079:** The General Financial Rules (GFR) of 1951 played a significant role by containing procurement rules. These rules underwent revisions in 1979 by the Federal government. Additionally, the delegation of financial power rules was involved to a certain extent.

Despite these legislative efforts, the previous legislations lacked a clear monitoring framework to detect any malpractices in public procurement. Furthermore, there was no unified system to address grievances related to procurement transactions. The public procurement landscape underwent a transformation in 2002 when a Presidential Ordinance led to the establishment of the Public Procurement Regulatory Authority (PPRA) at the federal level. The introduction of the Public Procurement Rules in 2004 and the Public Procurement Regulations in 2008 served to bolster and streamline this system. Following the 18th Amendment to the Constitution of Pakistan, which devolved power to the provincial level, public procurement became a provincial prerogative. Gilgit Baltistan is among the remote province of GB, with the limited resources and institutional capacity to manage mega project and Programme especially in public sector. The Gilgit Baltistan Cabinet approved the GB PPRA in 2022 and make it in enforcement from 9th September 2022.

Figure 2. Map of Pakistan and Gilgit Baltistan

Research Problem

Traditional procurement methods, still prevalent in many departments and organizations, involve lengthy processes for sourcing activities and selection strategies. This inefficiency stems from relying on paper-based procurement, where documents are sent to vendors via fax or couriers, resulting in delays in approval. The present procurement process is based on manual procedures which are slow and slower the systematic practice of purchasing, tendering, payment of invoices and CRM practice (Hawking et al, 2004). Traditional procurement methods also involve manual processes, leading to the emergence of e-procurement as a solution. By transitioning the entire procurement process online, e-procurement mitigates the risks associated with potential fraud, costs, quality, delivery, and market factors. This study examines how the adoption of e-procurement can drive positive changes in PSDP/donor-funded projects, enabling them to achieve their goals and objectives within specified timelines.

Research Objectives

The primary objective of this study is to provide a comprehensive analysis of the public procurement system in Pakistan, with a particular focus on exploring electronic/online procurement methods that have the potential to enhance transparency in Public Sector Development Program (PSDP) and donor-funded projects in the region of Gilgit Baltistan. Through this study, a thorough examination of the existing public procurement practices in Pakistan will be conducted. This will include an assessment of the strengths and weaknesses of the current system, identifying areas where transparency can be improved to ensure efficient utilization of resources. Furthermore, the study aims to explore electronic/online procurement methods as a potential solution to enhance transparency in the procurement of goods, services, and works for PSDP and donor-funded projects. By leveraging technology, these methods can streamline the procurement process, reduce manual intervention, and increase transparency through digital documentation and communication. The analysis will encompass various aspects, such as the implementation of e-bidding, e-auctions, and other automated procurement tools. The study will also evaluate the benefits and challenges associated with the adoption of electronic/online procurement methods in the context of Gilgit Baltistan, considering factors such as infrastructure, digital literacy, and stakeholder readiness. Ultimately, the findings of this study will contribute to the identification of practical recommendations and potential strategies to enhance transparency in the public procurement system of Gilgit Baltistan. By leveraging electronic/online procurement methods effectively, the aim is to establish a more transparent, accountable, and efficient procurement process for PSDP and donor-funded projects, leading to improved project outcomes and better utilization of resources. In summary, this study seeks to analyze the public procurement system in Pakistan and specifically explore electronic/online procurement methods to enhance transparency in PSDP and donor-funded projects in Gilgit Baltistan. Through this analysis, practical recommendations will be provided to foster a more transparent and efficient procurement process, ultimately benefiting the region's development initiatives.

Literature Review

E-Procurement

Electronic procurement, commonly known as e-procurement, is a modern approach wherein companies leverage the power of the internet (or sometimes an intranet) to acquire the goods and services required to efficiently run their businesses. By adopting a computerized workflow, e-procurement replaces traditional paper-based operations and effectively streamlines every aspect of the purchase process. Embracing e-procurement brings numerous benefits to organizations. It is true, electronic procurement may seem less glamorous and, in many ways, more difficult to

initiate, than online retailing. But, in fact, e-procurement (business to business electronic trade) has a far greater potential for cost savings and business improvement than online retailing or enterprise resource planning systems and will permanently and fundamentally reform the way we do business in the future (Dale 2001). E-Procurement refers to an innovative digital B2B business process that leverages internet technology to centralize and optimize purchasing workflows. By streamlining business transactions such as procuring goods and services, eProcurement aims to reduce costs and enhance overall purchasing processes. E-Procurement is a powerful solution that eliminates the inefficiencies of manual procurement processes and empowers businesses to streamline their operations. By embracing this digital transformation, organizations can achieve cost savings, improve efficiency, and ultimately enhance their overall purchasing experience. Although prices can be driven down through better vendor management, adherence to discounts, and the reduction of maverick buying, the big saving come through greatly reducing these transaction costs (Dale 2001). To understand the scale of what automating your procurement process can do, consider data offered by those who have initiated strong e procurement programs:

- British Telecom claims to have cut their average transaction cost from $80 to $ dollars on a volume of $1.3 million in transactions.
- The Aberdeen Group reports that e procurement systems have dropped the average transactions cost for the companies they surveyed from $107 to $30, with a corresponding drop in average cycle time from 7.3 days to 2 days.
- IBM sys that they cut the average cost of generating an order from $35 to less than a dollar.
- Raytheon Systems are predicting a reduction in the cost of their purchase order from $100 per piece to less than $3.
- Microsoft reduced direct purchasing costs from $60 to $5, and claims to have reduced its purchasing department from 29 to 2 full time purchasing employees.
- Companies report reducing transaction cost by as much as 75% very traditional phone or fax-based ordering.
- The Wall Street Journal sets the average cost of a paper-based purchase order at $150 and an e commerce PO at $25.

In short, companies that have invested strongly in e procurement have not only found a Significant return on their investment, but have come a long way in being able to get an accurate grasp on where and why they spend (Dale 2001). The adoption of E-procurement, or electronic procurement, is a global trend that promises increased efficiency, transparency, and accountability in public and private sector procurement processes (Bertot, Jaeger, and Grimes 2010). E-procurement, or electronic procurement, refers to the use of technology to conduct procurement activities such as sourcing, bidding, contracting, and payment, through online platforms. E-procurement has several benefits such as improving transparency, efficiency, and reducing corruption in the procurement process (Zunk et al. 2014). Public procurement is the process of purchasing products or service through an administrative unit to provide public services such as education, defense infrastructure, and health (Ambe, 2016). The public procurement process consists of several steps, including assessing needs, awarding contracts, managing contracts, and making payments (Ambe, 2016). Furthermore, the public procurement process involves acquiring resources like building, design, and consultation, which are essential since the primary funding source for public projects is tax revenue (Yoon, 2023). According to Thai (2001), the government engages in four main economic activities: establishing the legal framework, disbursing revenue, providing public goods and services, and purchasing goods, services, and capital assets. Public procurement is both a strategic tool and a means for implementing policies for socioeconomic development and transformation (Turley & Perera, 2014). With increasing scrutiny and rapid change due to technology, program reviews, and political expectations, public procurement plays a vital role in improving the quality and efficiency of public services (Eyaa & Oluka, 2011; Pirvu

& Stanciu- Tolea, 2014). For the public procurement process to be efficient, several guiding principles must be followed, including value for money, economy, transparency, quality of products and services, and fair competition. Pakistan ranks 124th out of 180 countries in terms of corruption, with public contract management and procurement being major areas where corruption is found (Fazekas & Kocsis, 2020). Cartels of vendors may form due to flaws in public procurement regulations, leading to lower prices and facilitating unethical behavior. Increased spending and procurement volume heighten the risk of fraud, misuse of public money, and other transparency-related issues. Transparency and accountability in the public procurement system require a favorable setting, a well-established framework, administrative capacity, and a legal framework (Ali et al., 2021). Pakistan has a huge concern approximately 20% of Pakistan budget has been spent on public procurement annually which is all taxpayer money of a common man, transparency and accountability remains the major concern in Pakistan, and thousands of corruption cases reported annually to cope up with the issue Pakistan public procurement regulatory authority (PPRA) has launched the E-procurement program to ensure the maximum output from the public projects. In Pakistan, the adoption of e-procurement has been slow, and the public sector still largely relies on procurement which enables organizations to streamline the procurement process, reduce costs, improve efficiency, and enhance transparency (Noor, Khalfan, and Maqsood 2013). In Pakistan, the adoption of e-procurement in the public sector can have several positive implications. Firstly, it can help to reduce corruption by minimizing human intervention in procurement activities and ensuring a fair and transparent bidding process. It can also improve the efficiency and speed of procurement processes by eliminating manual paperwork and reducing processing times. Moreover, e-procurement can help to increase competition among suppliers, leading to better quality and lower prices for goods and services. It can also improve the tracking and monitoring of procurement activities, making it easier to manage contracts and ensure compliance with regulations (Zaidi et al. 2019).

Research Questions

a. Does the implementation of an E-Procurement Management System lead to a significant improvement in the efficiency of procurement processes for Public Sector and PSDP/donor funded projects?
b. To what extent does the implementation of an E-Procurement Management System contribute to increased transparency in the procurement processes of Public Sector and PSDP/donor funded projects?
c. Does the integration of an E-Procurement Management System lead to a fairer distribution of opportunities and resources among various stakeholders involved in Public Sector and PSDP/donor funded projects?
d. Can the E-Procurement system be correlated with an increased number of qualified bidders and a more competitive bidding environment?
e. Does the adoption of an E-Procurement Management System contribute to achieving the best value for money in the procurement of goods and services for Public Sector and PSDP/donor funded projects?

Theoretical Framework

In today's modern era, the incorporation of technology into procurement processes has become a vital strategy for improving organizational performance, especially in the public sector and projects funded by Public Sector Development Programs (PSDP) or donors. E-Procurement, known for its use of digital platforms and automated systems, holds the potential to deliver enhanced efficiency, transparency, fairness, competition, and the achievement of optimal value for money. It is also seeks to illuminate the interplay between E-Procurement and the critical factors

mentioned, underscoring their importance in the realm of public sector operations and project management. A theoretical comprehension of the transformative capacity of E-Procurement in the public sector and PSDP/donor-funded projects highlights its pivotal role as a driver for realizing efficiency, transparency, fairness, competition, and optimal value for money.

Expanding on the intricate relationships among these elements, this framework establishes a solid foundation for empirical research and practical implementation strategies. These efforts are designed to enhance procurement practices and drive organizational goals forward in the digital era.

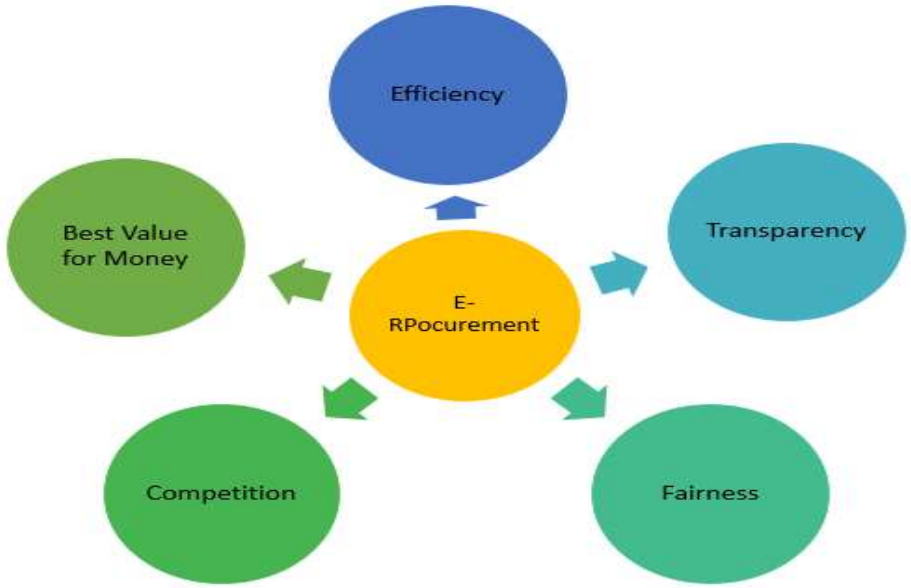

Figure 3: Framework

Research Methodology

Research Design

The research design is a master plan specifying the methods and procedures for collecting and analyzing the needed information (Zikmund, 2003). According to Cooper and Schindler (2001), descriptive studies deal with the question of who, what, when, where and how topics are used, where there is some understanding of the topic. A descriptive research design was used in this study. Descriptive survey is a method of collecting information by interviewing or administering a questionnaire to a sample of individuals (Orodho, 2003). The research methodology employed in this study aligns with quantitative research methods, which involve the systematic collection and analysis of numerical data to understand phenomena. Quantitative research relies on structured questions that are predetermined and administered to various respondents or participants. In this investigation, the survey method was chosen as the means of data collection. The primary research method utilized in this study involves the direct gathering of respondent data through the administration of an adapted questionnaire. The questionnaire employed in this study is structured with closed-ended questions, enabling the collection of quantifiable responses for analysis. The focus of this study revolves around examining the efficacy of implementing an E-Procurement Management System for Public Sector and PSDP/donor funded Projects. The primary objectives include enhancing efficiency, transparency, fairness, and competition, ultimately striving to obtain the best value for money. By employing quantitative research methods and utilizing a structured survey instrument, this study seeks to systematically assess the impact and effectiveness of implementing an E-Procurement Management System in the context of public sector and donor-funded projects.

Target Population

Population refers to an entire group of persons or elements that have at least one thing in common. Population also refers to the larger group from which a sample is taken (Orodho, 2003). A population can be defined as encompassing all individuals or entities that possess the specific characteristic which one wishes to comprehend. The study primarily concentrated on personnel affiliated with the public and private sectors, including staff from donors and donor-funded procurement management, operations, finance departments, infrastructure teams, and monitoring and evaluation management staff.

Table 1: Gender wise

Gender	Population	Percentage
Male	68	87.18%
Female	10	12.82%
Total	78	100%

Table 2: Sector wise

Sector	Population	Percentage
Public Sector	42	53.85%
Donor	2	2.56%
Donor Funded Project	25	32.05%
Private Sector	9	11.54%
Total	78	100%

Sample Design and Procedure

A sample is a part of the target population that is procedurally selected to represent the population (Cooper and Schindler, 2001). The researcher used the stratified random sampling method to select a sample size from the staff in the organization since this method is not selective and therefore provided free and equal chance of participation to all the respondents.

Table 3: Department wise

Department	Population	Percentage
Programme Management Staff	30	38.46%
Procurement Management Staff	17	21.79%
Financial Management Staff	12	15.38%
Infrastructure/Construction Management Staff	10	12.82%
Monitoring & Evaluation Staff	9	11.54%
Total	78	100%

Table 4: Experience wise

Years of Experience	Population	Percentage
1 – 5	22	28.21%
6 – 10	22	28.21%
11 – 15	12	15.38%
16 – 20	10	12.82%
21 and above	12	15.38%
Total	78	100%

Data Collection

Primary data is crucial for conducting research as it directly gathers information for the purpose of the study, providing authentic and factual insights obtained directly from the field. The researcher used questionnaires as the main tool for data collection. The data collected was called the raw data since it could not interfere with in any way, and it was only made available by the research study (Nderitu, 2012).

Findings and Results

Based on the research questionnaire response the results and analysis are as under:

Descriptive Statistics							
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
E-Procurement	78	2.27	1.374	.299	.272	-1.699	.538
Efficiency	78	2.19	.704	-.289	.272	-.930	.538
Transparency	78	1.68	.592	.226	.272	-.600	.538
Fairness	78	2.05	1.395	.643	.272	-1.560	.538
Competition	78	4.17	1.121	-1.756	.272	2.656	.538
Best value for money	78	2.18	1.403	.454	.272	-1.738	.538
Valid N (list wise)	78						

The provided table represents descriptive statistics for various aspects related to e-procurement. These statistics are calculated based on a sample size of 78 responses. Let's break down the information in the table:

1. N: The number of valid responses or observations in the sample, which is 78.
2. Mean: The average value for each aspect. It represents the central tendency of the data.
3. Std. Deviation: The standard deviation measures the spread or dispersion of the data from the mean. A higher standard deviation indicates more variability.
4. Skewness: This statistic measures the symmetry of the data distribution around the mean. A value close to 0 indicates a symmetrical distribution.
5. Kurtosis: It measures the "peakedness" of the distribution. A value close to 0 indicates a normal distribution.
6. Std. Error: The standard error of the statistic, which is used to measure the reliability of the estimate.

For each aspect, the table provides the statistic value and its standard error. The aspects mentioned are:

1. E-Procurement
2. Efficiency
3. Transparency
4. Fairness
5. Competition
6. Best value for money

The last row indicates the valid number of cases (N) used for the analysis, which is 78.

Correlations

		Best value for money	Competition	Fairness	Transparency	Efficiency	E-Procurement
Best value for money	Pearson Correlation	1	.633**	.971**	.696**	.859**	.938**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	78	78	78	78	78	78
Competition	Pearson Correlation	.633**	1	.567**	.649**	.815**	.687**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	78	78	78	78	78	78
Fairness	Pearson Correlation	.971**	.567**	1	.649**	.850**	.894**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	78	78	78	78	78	78
Transparency	Pearson Correlation	.696**	.649**	.649**	1	.711**	.762**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	78	78	78	78	78	78
Efficiency	Pearson Correlation	.859**	.815**	.850**	.711**	1	.819**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	78	78	78	78	78	78
E-Procurement	Pearson Correlation	.938**	.687**	.894**	.762**	.819**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	78	78	78	78	78	78

**. Correlation is significant at the 0.01 level (2-tailed).

The table provided represents the correlation matrix for the given dataset. Correlation measures the strength and direction of the linear relationship between two variables. In this case, the correlations are calculated for the following aspects:

For each pair of aspects, the table shows:

1. Pearson Correlation:
2. The correlation coefficient that ranges between -1 and 1, indicating the strength and direction of the relationship.

2. Sig. (2-tailed): The significance level of the correlation. A value close to 0 indicates a statistically significant correlation.

3. N: The sample size used for the correlation analysis, which is 78.

From the table, we can observe that most of the correlations are statistically significant (p-value < 0.01), indicating a strong linear relationship between the aspects. The highest correlation is between "Best value for money" and "E-Procurement" (Pearson Correlation = 0.938). This suggests that as the level of e-procurement improves, the perceived value for money also increases significantly. Similarly, other aspects like competition, faireness, transparency, and efficiency also show strong positive correlations with e-procurement.

Case Processing Summary			
		N	Marginal Percentage
Efficiency	Moderately	13	16.7%
	Significantly	37	47.4%
	Very Significantly	28	35.9%
E-Procurement	Agree	40	51.3%
	Disagree	1	1.3%
	Neutral	14	17.9%
	Strongly Agree	22	28.2%
	Strongly disagree	1	1.3%
Valid		78	100.0%
Missing		0	
Total		78	
Subpopulation		5[a]	
The dependent variable has only one value observed in 3 (60.0%) subpopulations.			

The provided table represents a case processing summary for two variables: Efficiency and E-Procurement. This summary provides an overview of the responses given by the participants in different categories.

1. **Efficiency:**
   The table shows the marginal percentage for three levels of efficiency impact: Moderately, Significantly, and Very Significantly. The participants were asked to rate the efficiency improvement due to e-procurement. The majority (47.4%) reported a significantly positive impact, followed by 35.9% with a Very Significantly positive impact, and 16.7% with a moderately positive impact.
2. **E-Procurement:**
   The table shows the marginal percentage for different levels of agreement with the statement related to e-procurement. Participants were asked to rate their agreement with the statement. The majority (51.3%) agreed, while 35.9% strongly agreed, 17.9% were neutral, 1.3% disagreed, and 1.3% strongly disagreed.

The valid N (78) and total N (78) are the same, indicating that there are no missing values in the dataset. The subpopulation information (5a) suggests that the dependent variable has only one value observed in 3 (60.0%) subpopulations, which might be an indication of limited variation in the responses.

Model Fitting Information				
	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	97.521			
Final	7.070	90.451	8	.000

The given table presents information about a model fitting process, comparing an "Intercept Only" model and a "Final" model. The table shows various metrics to evaluate the goodness of fit for each model. In this case, the "Model Fitting Criteria" column indicates how well each model fits the data. A lower value in the "-2 Log Likelihood" column suggests a better fit. Here, the "Final" model has a lower value (7.070) compared to the "Intercept Only" model (97.521), implying the "Final" model fits the data better. The "Likelihood Ratio Tests" section provides more information

to compare the models. The chi-square value for the "Final" model is 90.451, with 8 degrees of freedom (df) and a significance level (Sig.) of 0.000. This means that the difference between the two models is statistically significant, suggesting that the "Final" model is indeed a better fit for the data. In conclusion, the "Final" model provides a better fit to the data based on the provided model fitting information.

Pseudo R-Square	
Cox and Snell	.686
Nagelkerke	.789
McFadden	.568

The given values represent the Pseudo R-squared statistics for three models: Cox and Snell, Nagelkerke, and McFadden. Pseudo R-squared is a measure used in logistic regression analysis to assess the model's explanatory power, similar to the R-squared in linear regression. It indicates the proportion of the variance in the outcome variable that the model explains.
1. Cox and Snell Pseudo R-squared (.686): This value suggests that about 68.6% of the variance in the outcome variable is explained by the model.
2. Nagelkerke Pseudo R-squared (.789): This value indicates that approximately 78.9% of the variance in the outcome variable is explained by the model.
3. McFadden Pseudo R-squared (.568): According to this value, the model explains about 56.8% of the variance in the outcome variable.
In summary, these Pseudo R-squared values indicate that the models have a reasonable ability to explain the variance in the outcome variable, with the Nagelkerke model having the highest explanatory power, followed by the Cox and Snell model, and then the McFadden model.

Likelihood Ratio Tests				
	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	7.070[a]	.000	0	.
E-Procurement	97.521	90.451	8	.000
The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.				
a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.				

The given table presents Likelihood Ratio Tests for evaluating the significance of different effects in the model. The purpose of these tests is to determine whether including a specific effect (e.g., "E-Procurement" in this case) improves the model's fit to the data significantly.

1. **Effect: Intercept:**
   The reduced model only includes the intercept, and the final model also includes the "E-Procurement" effect. The -2 log-likelihood of the reduced model is 7.070, while the final model's -2 log-likelihood is 90.451. The chi-square value is the difference between these two values, which is 90.451 - 7.070 = 83.381.

2. **Effect: E-Procurement:**

The reduced model does not include the "E-Procurement" effect, and the final model does. The -2 log-likelihood of the reduced model is 97.521, while the final model's -2 log-likelihood is 90.451.

Parameter Estimates									
Efficiency[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Moderately	Intercept	-19.720	13597.603	.000	1	.999			
	[E-Procurement=1]	36.943	13682.744	.000	1	.998	11068304302173888	.000	.[b]
	[E-Procurement=2]	18.952	.000	.	1	.	170189303.444	170189303.444	170189303.444
	[E-Procurement=3]	1.832	14022.373	.000	1	1.000	6.249	.000	.[b]
	[E-Procurement=4]	.000	14197.066	.000	1	1.000	1.000	.000	.[b]
	[E-Procurement=5]	0[c]	.	.	0	.	.	.	.
Significantly	Intercept	-18.674	11348.655	.000	1	.999			
	[E-Procurement=1]	36.628	11450.531	.000	1	.997	807687217655847	.000	.[b]
	[E-Procurement=2]	37.262	15105.140	.000	1	.998	15235071126422672	.000	.[b]
	[E-Procurement=3]	19.261	11348.655	.000	1	.999	231825471.736	.000	.[b]
	[E-Procurement=4]	.000	11603.712	.000	1	1.000	1.000	.000	.[b]
	[E-Procurement=5]	0[c]	.	.	0	.	.	.	.
a. The reference category is: Very Significantly.									
b. Floating point overflow occurred while computing this statistic. Its value is therefore set to system missing.									
c. This parameter is set to zero because it is redundant.									

The chi-square value is the difference between these two values, which is 97.521 - 90.451 = 7.070. In both cases, the chi-square values are statistically significant (.000), which means that including the respective effects (Intercept and E-Procurement) in the model significantly improves the fit to the data.

The table shows that seems to display parameter estimates for a statistical model, likely related to e-procurement. Each row represents a specific level of e-procurement (e.g., [E-Procurement=1], [E-Procurement=2], etc.), and the columns show details such as the intercept, standard error, Wald statistic, degrees of freedom, significance level, and exponentiated parameter (Exp(B)) with its 95% confidence interval.

The values in the "Sig." column represent the p-values associated with each parameter estimate. A p-value close to 0 (e.g., .000) indicates that the parameter is statistically significant, meaning that there is a strong relationship between the e-procurement level and the outcome variable. The Exp(B) values and their confidence intervals provide an idea of the magnitude and direction of this relationship.

The "a" and "b" notes at the end of the table are explanations for certain symbols or issues that occurred during the analysis:

a. The reference category for comparison is "Very Significantly."

b. Floating point overflow occurred for some calculations, resulting in system missing values.

c. Some parameters are set to zero because they are reductions of other parameters or redundant in the model.

To interpret the specific meaning of these results, it would be necessary to have more context about the model, the outcome variable, and the e-procurement levels being studied.

Regression

Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	E-Procurement[b]	.	Enter
a. Dependent Variable: Efficiency			
b. All requested variables entered.			

This table seems to represent a stepwise regression analysis where the dependent variable is "Efficiency," and the independent variable is "E-Procurement." The stepwise regression method aims to find the best predictors for the dependent variable by entering and removing variables based on statistical significance. In this particular model (Model 1), the variable "E-Procurement" was entered into the analysis. The "Variables Entered" section indicates that no other variables were added to the model at this step, suggesting that "E-Procurement" is the only predictor being considered in this model. The "Variables Removed" section shows that no variables were removed from the model, which means that "E-Procurement" is the only variable included in the final model. The method used in this analysis is "Enter," which is also known as the forward selection method. It starts with no predictors and adds the most significant variable at each step until no more significant variables remain. In this case, "E-Procurement" was found to be significant and was entered into the model. In summary, this table presents a simple regression model where "E-Procurement" is the only predictor for the dependent variable "Efficiency," and this model was built using the forward selection method.

Model Summary									
				Std. Error of the	Change Statistics				
Model	R	R Square	Adjusted R Square	Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.819[a]	.671	.666	.406	.671	154.879	1	76	.000
a. Predictors: (Constant), E-Procurement									

This table provides a summary of a regression model with the dependent variable "Efficiency" and the predictor variable "E-Procurement." The model summary includes several key statistics to evaluate the model's performance and significance.

1. R (R-squared):
   This value represents the proportion of the variation in the dependent variable (Efficiency) that can be explained by the predictor variable (E-Procurement). In this case, R = 0.819, which means that 81.9% of the variation in Efficiency can be attributed to E-Procurement.
2. R Square:
   This value is the square of R and represents the percentage of the total variance in the dependent variable explained by the predictor variable. In this model, R Square = 0.671, indicating that 67.1% of the total variance in Efficiency is explained by E-Procurement.
3. Adjusted R Square:
   This value is a slightly more conservative measure of model fit that accounts for the number of predictors in the model. It ensures that adding more variables doesn't artificially inflate the R Square value. In this case, Adjusted R Square = 0.666.
4. Std. Error of the Estimate:

This value represents the standard deviation of the residuals (the differences between the observed and predicted Efficiency values). A smaller value indicates a better fit of the model. Here, Std. Error of the Estimate = 0.406.

5. Change Statistics:

These values provide information about the improvement in the model fit when adding the predictor variable E-Procurement.

- R Square Change: The increase in R Square due to adding E-Procurement, which is 0.671 in this case.
- F Change: A test statistic that evaluates whether the addition of E-Procurement significantly improves the model fit. A smaller p-value indicates stronger evidence in favor of the improved fit. In this model, F Change = 154.879, and the p-value is less than 0.001 (not shown in the table).
- df1 and df2: The degrees of freedom for the numerator (df1) and denominator (df2) in the F test. In this case, df1 = 1 (since there's only one predictor variable) and df2 = 76 (the sample size minus the number of predictors).
- Sig. F Change: The p-value associated with the F test, which is extremely low (less than 0.001) in this case, providing strong evidence that E-Procurement significantly improves the model fit.

In summary, this model summary table indicates that the model with the predictor variable E-Procurement explains a substantial proportion of the variation in the dependent variable Efficiency. The addition of E-Procurement significantly improves the model fit, and overall, the model has a good fit with a relatively small standard error of the estimate.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.569	1	25.569	154.879	.000[b]
	Residual	12.547	76	.165		
	Total	38.115	77			
a. Dependent Variable: Efficiency						
b. Predictors: (Constant), E-Procurement						

This table presents the Analysis of Variance (ANOVA) for the regression model with the dependent variable "Efficiency" and the predictor variable "E-Procurement." ANOVA is used to determine whether there are statistically significant differences among group means and to evaluate the overall significance of the model.

1. Model: The regression model being analyzed.
2. Sum of Squares:

- Regression: The sum of squared differences between the predicted Efficiency values based on the model and the actual observed Efficiency values. A larger value indicates a better fit of the model.
- Residual: The sum of squared differences between the actual observed Efficiency values and the predicted Efficiency values based on the model. A smaller value indicates a better fit of the model.
- Total: The sum of squared differences between the actual observed Efficiency values and their mean.

3. df (degrees of freedom):

- Regression: The difference between the number of predictors in the model and the number of predictors in the intercept-only model (i.e., the number of independent variables minus 1). In this case, df = 1 (since there's only one predictor variable).

- Residual: The difference between the sample size (number of observations) and the number of predictors in the model (i.e., the sample size minus the number of independent variables). In this case, df = 76.
- Total: The sample size minus 1 (i.e., the number of observations minus 1). In this case, df = 77.

4. Mean Square:
The sum of squares divided by its corresponding degrees of freedom. It provides an estimate of the variance associated with each source of variation (regression or residual).
5. F:
The F-statistic, which is calculated as the Mean Square Regression divided by the Mean Square Residual. It tests the null hypothesis that there is no linear relationship between the dependent variable and the predictor variables. A larger F-value indicates stronger evidence against the null hypothesis.
6. Sig.:
The p-value associated with the F-statistic. A smaller p-value indicates stronger evidence against the null hypothesis, suggesting that the predictor variable significantly contributes to explaining the variation in the dependent variable. In this case, the p-value is less than 0.001, providing strong evidence that E-Procurement significantly predicts Efficiency.
In summary, the ANOVA table for this regression model shows that the addition of E-Procurement as a predictor significantly improves the model's ability to explain the variation in the dependent variable Efficiency. The F-statistic and the associated p-value provide strong evidence against the null hypothesis, indicating that E-Procurement is a significant predictor of Efficiency.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.241	.089		13.900	.000
	E-Procurement	.419	.034	.819	12.445	.000

a. Dependent Variable: Efficiency

This table presents the coefficients for the regression model with the dependent variable "Efficiency" and the predictor variable "E-Procurement." The coefficients help us understand the relationship between the predictor variable and the dependent variable.
1. Model: The regression model being analyzed.
2. Unstandardized Coefficients:
- (Constant): The intercept of the regression line, which represents the predicted value of Efficiency when the predictor variable E-Procurement is equal to 0. In this case, the intercept is 1.241.
- B (E-Procurement): The unstandardized regression coefficient for E-Procurement, which represents the change in Efficiency associated with a one-unit increase in E-Procurement, holding all other factors constant. In this case, the unstandardized coefficient is 0.419.

3. Standardized Coefficients (Beta):
The standardized regression coefficients, which indicate the strength and direction of the relationship between the predictor variable and the dependent variable, controlling for the effects of other variables. Beta values range from -1 to 1, with higher absolute values indicating stronger relationships. In this case, the standardized coefficient for E-Procurement is 0.819, indicating a strong positive relationship between E-Procurement and Efficiency.

4. t:
The t-statistic for each coefficient, which tests the null hypothesis that the corresponding coefficient is equal to zero. A larger t-value indicates stronger evidence against the null hypothesis.
5. Sig.:
The p-value associated with the t-statistic for each coefficient. A smaller p-value indicates stronger evidence against the null hypothesis, suggesting that the corresponding coefficient significantly contributes to explaining the variation in the dependent variable. In this case, both the intercept and the coefficient for E-Procurement have p-values less than 0.001, providing strong evidence that they significantly predict Efficiency.
In summary, this table shows the coefficients for the regression model with E-Procurement as the predictor variable. Both the intercept and the coefficient for E-Procurement have strong and statistically significant associations with the dependent variable Efficiency, as indicated by their standardized coefficients, t-values, and p-values.

Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	E-Procurement[b]	.	Enter
a. Dependent Variable: Transparency			
b. All requested variables entered.			

This table describes the stepwise regression process for the model with the dependent variable "Transparency" and the predictor variable "E-Procurement." Stepwise regression is a method that adds or removes variables from the model based on statistical significance to improve the model's predictive power.
1. Model: The regression model being analyzed.
2. Variables Entered: The predictor variable(s) that were added to the model at this step. In this case, E-Procurement was the only variable entered, as it is the only requested variable.
3. Variables Removed: In stepwise regression, if a variable is removed from the model, it would be listed here. However, in this case, no variables were removed, as all requested variables were entered.
4. Method: The method used for adding or removing variables in the stepwise regression process. In this case, the "Enter" method was used, which adds all requested variables to the model in a single step.
In summary, this table indicates that the model with the dependent variable "Transparency" has E-Procurement as the only predictor variable, as it was the only requested variable entered in the stepwise regression process using the "Enter" method.

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	.762[a]	.581	.575	.386	.581	105.303	1	76	.000

a. Predictors: (Constant), E-Procurement

This table provides a summary of the regression model's performance with the dependent variable "Transparency" and the predictor variables "E-Procurement" and the intercept "(Constant)."

1. Model:
   The regression model being analyzed.
2. R:
   The multiple correlation coefficient, which represents the strength and direction of the linear relationship between the predictor variables and the dependent variable. R ranges from -1 to 1, with values closer to 1 indicating a stronger relationship. In this case, R is 0.762, indicating a relatively strong relationship between the predictors and the dependent variable.
3. R Square:
   The coefficient of determination, which is the square of the multiple correlation coefficient (R). R Square indicates the proportion of the variance in the dependent variable that can be explained by the predictor variables. In this case, R Square is 0.581, meaning that 58.1% of the variation in Transparency can be explained by the predictor variables in the model.
4. Adjusted R Square:
   The adjusted R Square, which is a slightly more stringent measure of the model's goodness of fit that accounts for the number of predictor variables. It prevents overestimating the model's predictive power when adding more variables. In this case, the adjusted R Square is 0.575, which is slightly lower than the regular R Square, indicating that the model's predictive power may be slightly overestimated due to the inclusion of only one predictor variable.
5. Std. Error of the Estimate:
   The standard error of the estimate, which measures the average difference between the predicted and actual values of the dependent variable. A smaller value indicates better precision in the model's predictions. In this case, the standard error is 0.386.
   6. Change Statistics:
   - R Square Change: The change in R Square resulting from adding the predictor variables to the model. In this case, it is 0.581, indicating that the addition of E-Procurement as a predictor variable significantly improved the model's ability to explain the variation in Transparency.
   - F Change: The F statistic for testing the significance of the change in R Square. In this case, it is 105.303, which is highly significant ($p < 0.001$), indicating that the addition of E-Procurement as a predictor variable significantly improved the model's predictive power.
   - df1: The degrees of freedom for the numerator, which is equal to the number of predictor variables added to the model (1 in this case).
   - df2: The degrees of freedom for the denominator, which is equal to the total number of observations minus the number of predictor variables in the model (76 in this case).
   - Sig. F Change: The p-value associated with the F statistic for testing the significance of the change in R Square. In this case, it is 0.000, which is highly significant, indicating that the addition of E-Procurement as a predictor variable significantly improved the model's predictive power.
   In summary, this table provides an overview of the regression model's performance in predicting Transparency using E-Procurement and the intercept "(Constant)." The model has a relatively strong relationship with the predictor variables, explaining 58.1% of the variation in Transparency. The addition of E-Procurement as a predictor variable significantly improved the model's predictive power.

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.674	1	15.674	105.303	.000[b]
	Residual	11.313	76	.149		
	Total	26.987	77			

a. Dependent Variable: Transparency
b. Predictors: (Constant), E-Procurement

This ANOVA (Analysis of Variance) table provides information about the sources of variation in the regression model with the dependent variable "Transparency" and the predictor variables "E-Procurement" and the intercept "(Constant)."

1. Model:
   The regression model being analyzed.
2. Sum of Squares:
   The sum of squared differences between the actual values of the dependent variable and the predicted values for each source of variation.
3. df (Degrees of Freedom):
   The number of independent pieces of information in each source of variation.
4. Mean Square:
   The Sum of Squares divided by the corresponding df, which provides an estimate of the average variance for each source of variation.
5. F:
   The F statistic, which is the ratio of the Mean Squares for the regression model and the residual (error) variation. It tests the null hypothesis that there is no significant difference between the regression model and a model with no predictor variables.
6. Sig.:
   The p-value associated with the F statistic, which indicates the significance of the regression model compared to a model with no predictor variables. A low p-value (usually less than 0.05) suggests that the regression model is significant and provides a better explanation of the variation in the dependent variable than a model with no predictor variables.

In this ANOVA table:

1. "Regression" represents the variation explained by the predictor variables in the model. The Sum of Squares for Regression (15.674) is the sum of the squared differences between the actual and predicted values of Transparency when using the predictor variables in the model.

2. "Residual" represents the remaining variation in the dependent variable that is not explained by the predictor variables. The Sum of Squares for Residual (11.313) is the sum of the squared differences between the actual and predicted values of Transparency that cannot be explained by the model.

3. "Total" represents the total variation in the dependent variable, which is the sum of the variation explained by the model (Regression) and the unexplained variation (Residual).

The ANOVA table shows that the regression model with the predictor variables "(Constant)" and "E-Procurement" significantly explains the variation in Transparency ($F = 105.303$, $p < 0.001$). This indicates that including E-Procurement as a predictor variable in the model improves the explanation of the variation in Transparency compared to a model with no predictor variables.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.934	.085		11.025	.000
	E-Procurement	.328	.032	.762	10.262	.000

a. Dependent Variable: Transparency

This table provides information about the coefficients of the regression model with the dependent variable "Transparency" and the predictor variables "E-Procurement" and the intercept "(Constant)."

1. Model:
   The regression model being analyzed.
2. Unstandardized Coefficients:
   The raw coefficients (B) for each predictor variable, which represent the change in the dependent variable (Transparency) for a one-unit increase in the predictor variable, while holding all other variables constant.
3. Standardized Coefficients (Beta):
   The standardized coefficients, which indicate the relative importance of each predictor variable in explaining the variation in the dependent variable, controlling for the other predictor variables. Beta values range from -1 to 1, with values closer to 1 or -1 indicating a stronger relationship between the predictor variable and the dependent variable.
4. t:
   The t-statistic for each coefficient, which is the ratio of the coefficient (B) to its standard error (Std. Error). The t-statistic tests the null hypothesis that the coefficient is equal to zero (i.e., the predictor variable has no effect on the dependent variable).
5. Sig.:
   The p-value associated with the t-statistic for each coefficient, which indicates the significance of the predictor variable in the model. A low p-value (usually less than 0.05) suggests that the predictor variable is significantly related to the dependent variable and contributes to the model's predictive power.

In this Coefficients table:

1. "(Constant)" represents the intercept of the regression model, which is the predicted value of Transparency when all predictor variables are equal to zero. The coefficient for "(Constant)" is 0.934, indicating that when E-Procurement is zero, the average Transparency is 0.934.

2. "E-Procurement" represents the effect of the predictor variable "E-Procurement" on the dependent variable "Transparency." The coefficient for E-Procurement is 0.328, indicating that for a one-unit increase in E-Procurement, the predicted Transparency increases by 0.328, holding the other predictor variables constant.

3. The standardized coefficient (Beta) for E-Procurement is 0.762, indicating that E-Procurement has a relatively strong relationship with Transparency, controlling for the other predictor variables in the model.

4. The t-statistic for E-Procurement is 10.262, which is highly significant ($p < 0.001$), indicating that E-Procurement is a significant predictor of Transparency in the model.

In summary, this Coefficients table provides information about the raw and standardized coefficients for the predictor variables in the regression model, as well as their significance in

explaining the variation in Transparency. The intercept and E-Procurement both have significant effects on Transparency, with E-Procurement having a relatively strong relationship with the dependent variable.

Recommendations

In light of the comprehensive findings and conclusions derived from this study, the following recommendations are proposed for policy and practice:

Maximizing the Role of E-Procurement: Recognizing the pivotal role of e-procurement in the purchasing function, it is imperative to emphasize its significance. E-procurement enables procurement functions to redirect focus towards value-adding activities, thereby enhancing customer service and organizational efficiency.

Investment in E-Procurement Infrastructure: The transformative potential of e-procurement necessitates substantial investment in equipment, personnel, and knowledge to facilitate seamless procurement processes. Organizations must allocate resources to ensure the optimal implementation and operation of e-procurement systems, thereby leveraging its competitive advantages.

Embracing Cost-Effective E-Procurement Solutions: While there may be initial costs associated with e-procurement implementation, the long-term benefits far outweigh the short-term expenses. Organizations should focus on the potential savings and efficiencies gained through e-procurement, prioritizing its adoption as a strategic investment in operational optimization.

Adoption of E procurement in PSDP and Donor Funded Projects: To ensure widespread adoption and implementation of e-procurement practices, PSDP and donor-funded projects should explicitly outline budgets and mechanisms for e-procurement adoption in Planning Commission-I and financing agreements with donors. Making e-procurement adoption mandatory at project inception ensures streamlined procurement processes and promotes transparency and accountability.

In conclusion, the successful integration of these recommendations into policy and practice will not only optimize procurement performance but also foster transparency, efficiency, and accountability across public sector and donor-funded projects. Embracing e-procurement as a strategic imperative sets the stage for a more resilient and sustainable future, where resources are judiciously utilized to maximize societal welfare and economic growth.

References

Asian Development Bank (2013) e-Government Procurement Handbook ISBN 978-92-9254-3228 ,978-92-9254-323-5

Ali, A., Audi, M., Nisar, S., & Senturk, I. (2021). Determinants of public procurement efficiency: A comprehensive study of public procurement rules of Punjab, Pakistan.

Ambe, I. M. (2016). Public procurement trends and developments in South Africa. Research Journal of Business and Management-(RJBM), 3(4).

Bertot, John C., Paul T. Jaeger, and Justin M. Grimes. 2010. "Using ICTs to Create a Culture of

Transparency: E-Government and Social Media as Openness and Anti-Corruption Tools for Societies." Government Information Quarterly 27(3): 264–71.

Chaffey, D. (2004). E-business and e-commerce management strategy, implementation and practice. (Second edition). Prentice Hall.

Croom, S., & Jones, A. B. (2007). Impact of e-procurement: Experience from implementation in the UK public sector. Journal of Purchasing and Supply Management, 13, 294-303.

Cooper, D. and Schindler, D. (2001). Business Research methods, Cengage Learning India Private Limited, Alps Building,1st Floor,56 Janpath, New Delhi 110 001

Eyaa, S., & Nagitta Oluka, P. (2011). Explaining noncompliance in public procurement in Uganda.
European Commission Green Paper on expanding the use of e-Procurement in the EU (2010) Brussels, 18.10.2010, COM (2010) 571
Fazekas, M., & Kocsis, G. (2020). Uncovering high-level corruption: cross-national objective corruption risk indicators using public procurement data. British Journal of Political Science, 50(1), 155-164.
Federal & GB PPRA's Rules and Regulations
Fighting Collusion to optimize public procurement expenditure: The OECD Experience 30 March 2011
Government Procurement at Gatt/WTO: 25 Years of Plurilateral Framework by Margaret Liang, 2007
Hawking P., Stein A., Wyld D., and Forster S. (2004). E-procurement: is the ugly duckling actually a swan down under? Asia Pacific Journal of Marketing and Logistics Vol. 16 No. 1. 1-26.
Nderitu, J. (2012). The effect green procurement in a manufacturing Industry, Unpublished Edition, Nairobi, Kenya.
Neef, D. (2001). E-procurement: From Strategy to Implementation. New Jersey: Prentice Hall. Negotiation Process, European Business Review, 99(5), 313.
Noor, Muhammad Ali, Malik M.A. Khalfan, and Tayyab Maqsood. 2013. "The Role of Procurement
Practices in Effective Implementation of Infrastructure Projects in Pakistan." International Journal of Managing Projects in Business 6(4): 802–26.
Orodho, A.J. (2003). Essentials of Educational and Social Science Research methods: Qualitative and Quantitative Approaches. Nairobi Acts Press
Pirvu, D., & Stanciu-Tolea, C. (2014, October). Features of the public procurement market in Romania. In 2na Global Conference on Business, Economics, Management and TOURISM (pp. 30-31).
Roads to Nowhere: V. Tanzi, H. Davoodi; 1998, International Monetary Fund, ISBN 1- 55775-710-0
Thai, K. V. (2001). Public procurement re-examined. Journal of public procurement.
Turley, L., & Perera, O. (2014). Implementing sustainable public procurement in South Africa: Where to start.
Yoon, D. (2023). The Improvement Policy Design of Public Procurement Process for the Public Management Innovation in South Korea. SAGE Open, 13(1), 21582440231158260.
Zaidi, Syed Anees Haider, Faisal Mehmood Mirza, Fujun Hou, and Rana Umair Ashraf. 2019. "Addressing
the Sustainable Development through Sustainable Procurement: What Factors Resist the Implementation of Sustainable Procurement in Pakistan?" Socio-Economic Planning Sciences 68. https://doi.org/10.1016/j.seps.2018.11.008.
Zikimund, W. (2003). Business Research Methods, 4th Edition, Harcourt Publishers, London.
Zunk, Bernd Markus et al. 2014. "The Role of E-Procurement in the Austrian Construction Industry:
Adoption Rate, Benefits and Barriers." International Journal of Industrial Engineering and Management 5(1): 13–20.