



Challenges of Traditional Procurement Practices in Public Sector Universities: Evidence from Sindh, Pakistan

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ABSTRACT

Traditional procurement methods in public sector universities are often characterized by manual and paper-based mechanisms, which lead to procedural delays, improper documentation, low transparency and poor regulatory compliance. This study explores the problems with the conventional procurement mechanisms in public universities located in Sindh, Pakistan and thus fills an empirical gap with respect to the higher education institutions in the province. The research work has used a structured questionnaire so that the response of 66 answers out of 92 distributed questionnaires is valid with a good response rate of 71.74% among 27 public universities. The results show that a significant percentage of 91.91% of the procurement professionals continue to rely upon manual documentation. Technology-related barriers rise to the top post: Limited access to historical records (90.91%) and challenges managing procurement data (75.76%) are the main obstacles cited by 90.91% and 75.76% of our respondents respectively. Process related impediments are pronounced too; 89.39% mention long drawn procurement cycles, 69.70% note apprehensions on fairness and transparency and 62.12% mention high procurement costs. The challenges related to human resources are real; 90.91% of them note the problem of too many humans meddling, 75.76% see too low value placed on procurement activities, and 63.64% see too few procurement specialists. Compliance concerns remain for all constructs, which were supported by significant results of Cochran's Q test ($p < 0.05$). A staggering 89.39% of the respondents agreed that the traditional system of procurement should be replaced. The study concludes by taking a conclusive stance on how manual procurement practices contribute significantly to underlining underperformance, lack of transparency and compliance to the Sindh's Public Universities, thereby providing attractive empirical support for the adoption of e procurement solutions for modernizing procurement mechanisms within public sector.

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1. Introduction

Procurement is the key to making higher education institutions (HEIs) effective because it supports the acquisition of goods, services, and works that are essential to the academic, administrative, and research tasks carried out by them. Within Pakistan, public sector universities are bound to follow the regulatory framework issued by Public Procurement Regulatory Authority (PPRA) and its provincial counterparts, in particular Sindh Public Procurement Regulatory Authority (SPPRA). Nonetheless, the acquisition apparatus of many universities is still mired in legacy, paper eyes, and is marked by paperwork, physical files moving through-networks and multi-layered approval hierarchies. This archaic approach has real consequences - delays in procedures, unclear decision-making, documentation errors and limited oversight - which have been empirically shown to correlate with inefficiencies. Global data shows that public procurement is worth about 12% of the world Gross Domestic Product, which is equivalent to \$11 trillion per annum (Bosio, Hayman, & Dubosse, 2023), even in developing countries where it represents the value of procurement amounts to 30% of national GDP, making procurement prone to corruption and wastage (Oluwaseun & Damilola, 2025). The higher education of Sindh is facing an issue of chronic operational bottlenecks due to old fashioned procurement practices, which makes sense to be subjected to strict academic scrutiny. The lack of a coherent set of digital systems, combined with the limited technological potential and strong bureaucratic inertia, makes the process of procurement much longer and compromises the strict adherence to the stipulated procurement regulations (Zaidi, Ashraf, & Shah, 2023). As a result, the efficiency of institutional performance is hindered, and time-bound critical services; including academic services and healthcare equipment, are affected. Amidst a growing body of international literature related to procurement in the public sector, the empirical literature related to the problem of inefficient public sector procurement, specifically in the higher education sector of Pakistan, is woefully lacking. Existing studies have mainly been conducted with respect to procurement in a broader public sector context, with only little attention paid to the specific challenges facing higher education institutions. The current research attempts to cover this gap by conducting a pioneering study of the traditional procurement challenges prevailing among public sector universities in Sindh in an effort to add to the theoretical debate on the issue of public sector procurement and to the practical debate on higher education reform in Pakistan. A general account of the region shows that there are 27 public sector universities that work under the indenture of Sindh Public Procurement Regulatory Authority.

1.1. Research Problem

The growing focus of sound governance and prudent spending of the populace in Pakistan in the modern scholarship has failed to give resultant changes in the ways of procurement of the public universities. These institutions have still stuck with the old-fashioned, linear systems, which cannot fit the large scale and complex needs of the new academia. As a result, conventional procurement continues to be full of bureaucracy, cost increases, lack of transparency, extensive human interference, and weak connection with the existing regulatory frameworks.

Documented data show that the procurement process in Pakistan is carried out in a very demanding environment, in which the policies are not always implemented consistently, there is no significant digitalization, and the logistical machine is inefficient, all of which negatively affect the level of transparency and performance (Zaidi, Ashraf, & Shah, 2023). The problems that face public procurement within developing settings are unique because such undertakings regularly face idiosyncratic risks due to the poor governance framework, inappropriate regulatory frameworks and limited technological infrastructure (Islam, Amin, & Wardley, 2022).

Sindh is not an exception since in its public universities, there is a plethora of serious challenges: lengthy file processing, limited access to archival sources, excessive administrative paperwork, and a lack of a digital base. These obstacles have a negative effect not only on the effectiveness of operations but also on such crucial aspects as compliance, accountability, and service delivery. However, there is a paucity of empirical literature on the procurement issues in the higher education sector in Pakistan. This research will attempt to address this gap by methodically looking at the definite constraints of the conventional procurement practice within the Sindh public universities.

1.2. Research Questions

The following research questions will also guide this study:

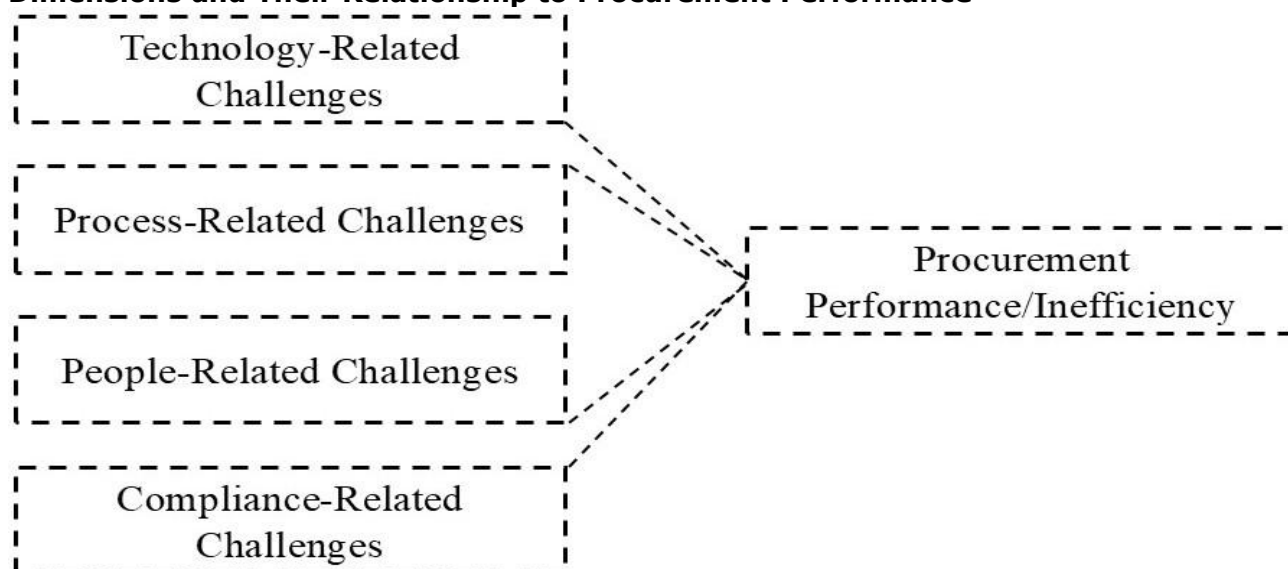
1. What are the key issues that are connected with old-fashioned procurement procedures in educational institutions of Sindh of the public sector?
2. What is the impact of technology related, process related, people related and compliance related issues on the efficiency of procurement?
3. How ineffective or outdated do the traditional system seem to be to the procurement professionals?
4. What institutional reasons in public sector Sindhi universities cause procurement delays and inefficiencies?

1.3. Research Hypothesis

1. The conventional methods of procurement are a huge barrier to performance in the universities of the public sector.
2. The effect of technology-related limitations on the procurement performance is statistically significant.
3. Delays in the procurement cycles are positively related to process-related inefficiencies.
4. The existence of the traditional systems is also associated with the resistance to technology use on the part of the procurement personnel.

1.4. Conceptual Framework

Figure 1: Conceptual Framework Illustrating the Four Hypothesized Challenge Dimensions and Their Relationship to Procurement Performance



1.5. Significance of the Study

The current research has a substantive value to the higher education governance and management of the Pakistani government. The research provides useful information to policy makers, administrators of institutions of higher learning, and procurement officers by listing and evaluating the significant issues of the conventional procurement systems. The results shed light on the most obvious weaknesses of the traditional procurement system and the necessity to introduce institutional changes and digitalization. The current research on procurement in the context of higher education stresses that the limited budget, the necessity to comply with different regulations, and decentralized buying introduce serious operational risks (Kiprotich Mutai, 2016). Traditionally, the developing context has been prone to corruption and inefficiency in its public procurement mechanisms, which hamper developmental results and service delivery (Obiri-Yeboah et al., 2025). Additionally, the study adds value to the scarcity of available empirical research on procurement issues in the higher education field in Pakistan. The findings can assist decision-makers to strengthen procurement transparency, compliance with regulations, maximization of resource use, and eventually strengthen institutional performance among the public universities in Sindh.

2. Literature Review

The importance of public procurement in the performance of the institutions and the overall functioning of the entire public sector has been recognized long ago. Researchers continue to argue that the procurement practices help in determining the level of transparency, fiscal responsibility, and the ability to provide the necessary services in time (Thai, 2001). Procurement is among the most vulnerable governmental functions in the low-income emerging economies, which is due to inefficiency in administration, poor governance, and limited technology. Recent evidence on the global level highlights that major challenges remain prevalent throughout the developing countries: public procurement is marred by a plethora of natural, political and social obstacles that make the project aspect of the process such as communication management, stakeholder engagement and procurement control more complex (Hossain & Islam, 2021). The procurement system in Pakistan works in a highly complicated environment where the regulations are inconsistently implemented, the processes have not yet been fully digitalized, and the logistics fails to work effectively, which reduces the level of transparency and efficiency (Gonçalves et al., 2024).

2.1. Traditional Procurement Weaknesses

Studies have been conducted in different settings which have revealed some of the potential weaknesses of conventional procurement practices. According to Puschmann and Alt (2005), the conventional, paper-based procurement is slow and error prone as there are several administrative checks and the channel of communication is not effective. The same is also mentioned by Rotich and Okello (2015) because manual procurement systems are linked to ineffective record management, trouble in accessing historical records and reduced transparency, which further complicates supervision. The findings are corroborated by the recent researches that are taking place across the globe. According to Gurgun et al. (2024), traditional procurement procedures are still challenged by such issues as the sudden cancellation of orders, significant fluctuations in the prices of materials, and unpredictable circumstances that demand numerous changes. When organizations use traditional systems, they have significantly more errors than when using automated systems, which causes delays, extra expenses and poor relations with vendors (Puschmann & Alt, 2005). Regulatory discrepancies, bureaucracy, and poor technological infrastructure are the problems of procurement faced in the development projects of the public sector in Bangladesh (Hossain & Islam, 2021). Manual procurement in Uganda allowed being manipulated and restricted the competition between suppliers because of the complexity of procedures (Simone, 2023). The same trends have been reported in South Africa, where poor data security, specifications, and manual operations result in procurement failures (Pooe, Mafini, & Makhubele, 2014).

2.2. Technology Related Challenges

The respondents have indicated that the universities do not have integrated digital systems to aid procurement processes. The use of manual documentation leads to low quality of data and inability to access records and decreased transparency. These are the same results that (Wangui, 2025) report, states that historical systems limit harmonization of data and impede effectiveness (Dhivya et al., 2023; Ragmoun, 2024). In particular, 90.91% of respondents in this investigation noted that they did not have access to historical procurement records, and 75.76% of them noted that they had challenges managing procurement data as one of the largest challenges. Recent data indicate that technology issues are still experienced in different parts of the world (Mohammad, 2015; Mohammad & Ahmed, 2017). A study conducted by counties of the COMESA found that insufficient digital infrastructure was a significant obstacle, with e-procurement becoming more widespread, 30 percent in 2020 and 70 percent in 2024, a sign of the pressing need to change digitally (Gilbert & Celestin, 2025). E-procurement systems apply the use of transactional information systems to conduct and manage procurement activities across the life cycle, which is very advantageous compared to the manual systems (Ning & Yao, 2023). The studies of India and Indonesia also support the finding that the substitution of manual procurement processes with electronic ones enhances the performance of the projects funded publicly (Kartika, 2022).

2.3. Process Related Challenges

The most mentioned barriers to the present study were process related; 89.39% of respondents mentioned that there was long procurement cycle, 69.70% mentioned that there was a lack of fairness and transparency in procurement and 62.12% mentioned high procurement costs. These observations are congruent with the rest of the scholarship. Puschmann and Alt

(2005) recorded that organizations that use traditional systems had 40% more processing errors compared to organizations that used automated platforms. In more recent research, Gurgun et al. (2024) stated that on the one hand, the traditional nature of procurement activities still faces a set of various challenges, and, on the other hand, there are occasional cancellations of orders and high levels of price fluctuations. In line with this, empirical studies of Kenya show that the manual procurement processes are still dominant in the majority of the Kenyan public universities, despite the existing digital options, and that such dependency leads to the introduction of significant procedural lag (Waithaka & Kimani, 2021). Poor data security, vague specifications, and redundancy of physical documents among others are among the causes of failed procurement processes in the South African context (Pooe, Mafini, & Makhubele, 2014). Abu Bakar et al. (2016) highlighted that traditional communication channels, such as letters and memos among other visual records, although providing real-life documents, are expensive in terms of time, especially when speed in decision-making is needed, thus resulting in missed opportunities and a negative relationship with the suppliers.

2.4. People Related Challenges

In addition to technical limitations, the problem also has enormous human and governance aspects. Conventional procurement system requires human intervention in the entire process, and thus increasing the risk of bias, miscommunication and non-conformity to standardized procedures. In the current research, 90.91% of the participants explained that they experienced excessive human intervention, 75.76% stated that they undervalued procurement activities, and 63.64% stated that there was a shortage of procurement specialists. Sang and Mugambi (2014) argue that in developing economies, the lack of proper implementation of procurement regulations, as well as staff capacity, has been continually affecting procurement in the public sector. The available literature records that procurement professionals in the developing economies have dissatisfaction in the workplace because they are exposed to poor organizational culture, underdeveloped compensation policies, and lack of career development opportunities (Changalima et al., 2023). The fear and the lack of information system skills are the underlying causes of employee resistance to change, which makes it highly important to offer extensive training programmes (Yu et al., 2015). Croom and Brandon-Jones (2005) also highlight that poor training and lack of technological change often suppress the adoption of more effective procurement strategies by the organizations. Such issues have a direct reflection in the case of state-run universities in Sindh where the procurement team has been receiving no ICT training and is still used to working with paperwork (Gonçalves et al., 2024).

2.5. Compliance Related Challenges

The issues concerning compliance are also represented in the literature, as well as in the results of this research. The existing body of literature shows that compliance with the procurement rules is significantly low in many governmental organizations (Malacina et al., 2022). Weaknesses in monitoring systems, gaps that exist in documentation, and taking shortcuts in procedures often give rise to objections during the audit and undermine a sense of accountability. Recent reports also demonstrate that the South African public procurement is challenged by underlying problems such as inflation of prices, offering procurement contracts to friends or family, lack of proper advertisement of tenders, and improper constitutions of bid committees (Nzimakwe & Biyela, 2021).

In the institution of higher learning, compliance failures may contribute to the slowing down of the procurement process, make budgeting processes difficult and disrupt academic processes. Empirical studies of Ethiopian state universities show that good procurement planning and increased staff competency have a positive correlation with organizational performance, which underlines the significance of curbing compliance and capacity failures (Mebrate & Shumet, 2024). Staff in the sector have little experience and lack skills in most of the developing countries, staff turnover is high and lacks incentive (Fourie & Malan, 2020). In line with this, the literature confirms that traditional procurement systems are not only operationally inefficient but also they are susceptible to governance failures that limit their effectiveness in addressing the institutional requirements.

Taken together, these works indicate that conventional procurement systems are increasingly unsuitable to the requirements of the modern public sector organizations. The absence of digital infrastructure, inefficiencies in the procedures, human constraints, and

compliance issues are all elements that foster systemic vulnerabilities in procurement processes. This evidence provides a strong basis upon which to inquire into the particular issues that are facing the public universities in the state of Sindh where procurement practices are still very much entrenched in manual processes.

3. Research Methodology

3.1. Research Design

The current study used a quantitative, descriptive research design to analyze some of the obstacles in traditional procurement approaches in the universities of the Sindh region of the Pakistani public. This would best be done through descriptive inquiry, which would simplify the systematic identification process, analytical examination and interpretational analysis and synthesis of the challenges encountered in procurement activities as viewed by the workers that participate in the procurement activities.

3.2. Population and Sampling

The group of people to be studied included procurement offices, administrative officers, accounts officers and relevant university officials, who work in the government sector institutions of Sindh. Among the 92 questionnaires that were distributed among twenty-seven universities, a valid response rate of sixty-six was obtained, and this provided a good response rate of 71.74%. Purposive sampling strategy was used in ensuring that relevant and depth sampling was achieved by ensuring that the sample used captured participants whose involvement in the procurement activities was first hand. To compare, similar research has reported the response rates between 55% and 70% (Junijo, 2020), which highlights the statistical robustness of the current research.

To support the adequacy of the sample size, a post-hoc power analysis was performed and it was found that a chi-square goodness of fit test with a postulated effect size of 0.30 (medium), alpha of 0.05 and power of 0.80 would require at least 52 respondents. The actual sample had 66 participants which was comfortably above this minimum threshold and hence justified its sufficiency. In addition, the convenience nature of the sample of the purposive approach to choose the respondents among a pool of procurement professionals also enhanced the data set by giving each participant first-hand experience that is relevant to the variables of the study (Taherdoost & Madanchian, 2024).

3.3. Instrument and Measures

Data were gathered using a structured and a closed-ended questionnaire which was carefully designed with references to the available scholarship. The instrument has been divided into five specific questions (1) demographic information; (2) technology-related challenges; (3) process-related challenges; (4) people-related challenges; and (5) compliance-related challenges. The responses of the participants were sought through the 5-point Likert scale, with 1 (strongly disagree) to 5 (strongly agree). The questionnaire was designed to follow the perception of the respondents with regards to the barriers experienced in the traditional procurement systems. In order to protect the content validity of the instrument, the questionnaire was carefully checked by a group of academic researchers, all of whom stated that every item was faithful to the targeted construct.

Validity and reliability establishment was implemented in a multi-step methodological procedure. Critical appraisal was made to guarantee the content validity through three great scholars in the field of public administration and procurement, who were engaged to assess every item in relevance, lucidity, and construct coverage. After their discussions, some textual polishing measures were established before the final deployment of the tool. Pilot testing was conducted with the procurement officials of the public-sector organizations that were not involved in the main study, thus allowing to test the understanding of items; no significant problems were found in this pilot testing. Construct validity was also supported through anchoring each of the items to well-organized measurement frameworks which are reported in the literature. Cronbach alpha was used to measure reliability and all the four constructs had coefficients of more than 0.70 (Technology: $\alpha = 0.81$; Process: $\alpha = 0.79$; People: $\alpha = 0.76$; Compliance: $\alpha = 0.83$) thus indicating good internal consistency. Future research is recommended to add such reliability measures with the confirmatory factor analysis as another channel to prove construct validity. The scale of issues related to technology was based on the statements created by Yevu, Yu and Darko (2021) and Wangui (2025), including statements like: Our university does not have

integrated digital procurement systems and Retrieval of historical procurement records: It is hard to retrieve our procurement records because they are manually filed. The scale of process-related issues was developed with references to the constructs by Gurgun et al. (2024) and Puschmann and Alt (2005), such as statements such as Procurement cycles are too long and Repetitive paperwork increases processing time. Items used to measure people related challenges were based on those created by Changalima et al. (2023) and Croom and Brandon-Jones (2005), e.g., "Human interference often slows down procurement decisions and Procurement staff are not well trained in ICT. The approaches taken by Sang and Mugambi (2014) and Malacina et al. (2022) have informed the measurement of compliance-related challenges, and such indicators as "Adherence to SPPRA regulations is inconsistent" and "Incomplete documentation leads to audit objections were used.

3.4. Data Analysis Techniques

Descriptive and inferential statistical analysis was used to analyze data. Frequencies, percentages, and means are examples of descriptive statistics that were used to describe summaries of the major challenges identified in a succinct manner. In order to determine the statistical significance of these challenges in different categories, Cochran Q test was used since it is suitable in the case of dichotomous response and multiple correlated samples. The obtained test values produced strong p-values ($p < 0.05$) in all categories of challenges, which confirms the presence of systemic problems that are inherent in the traditional procurement procedures. Despite the fact that the data was collected using a 5-point Likert scale, Cochran's Q test was chosen for the inferential statistical test due to its appropriateness for identifying statistically significant differences across a range of related binary data. The data was reduced to a binary scale by re-coding the data points 4 and 5 as 1 (presence of a challenge) and data points 1 to 3 as 0 (absence of a challenge). This type of data transformation is consistent with the recommendations for the research on the procurement challenge, as the major interest is to find out if the particular challenge is perceived as significant by the respondents (Yevu, Yu, & Darko, 2021). Cochran's Q test was used to find out if there was a statistically significant difference in the proportion of respondents who perceived the presence of the challenges across the four categories of the challenges. The results were considered statistically significant if the p-value was below 0.05.

4. Results and Discussion

4.1. Demographic Characteristics

In the present study, 92 questionnaires were sent to different professionals—procurement experts and financial experts of different universities. In return, 66 people filled and participated in the study from 27 universities in Sindh, making a 71.74% response rate (Table 1), which is statistically very strong (Taherdoost & Madanchian, 2024). The response rate was high (54.54%) in general universities compared to medical (25.76%) and engineering universities (19.70%), respectively. Other studies have also shown 55-70% response rates (Karttunen et al., 2022). In this study, all procurement people were male. Similarly, (Nyeck, 2020) also reported male dominance in procurement departments. Yet there is increasing awareness of the benefits of gender diversity in leadership (Orser et al., 2021). Among the procurement experts, 54% were working in Goods and Services compared to Works and Services (35%), and Financial Experts (11%). Regarding age, 48.48% of respondents were aged between 31-40 years while 31.82% respondents were aged between 41-50 years. Moreover, 16.67% of the respondents were ≥ 51 years and 3.03% respondents were aged between 24-30 years (Table 1). Overall, the respondents aged between 30 to 50 have significant professional experience and aptitude to learn new things and would appreciate innovations which increase job performance. This age distribution is particularly relevant to e-procurement adoption, as research demonstrates that middle-aged professionals (31-50 years) exhibit optimal balance between professional experience and willingness to accept digital transformation (Chan & Owusu, 2022).

Recent comparative studies from African universities confirm that procurement professionals in this age range are more receptive to systems that improve job performance, driven by perceived ease of use and perceived usefulness (Chauhan, Kumar, & Jaiswal, 2022). Simon and Cheng (2023) also highlighted that most of the major factors contributing to the implementation of sustainable e-procurement practices relate to operational efficiency, cost-effectiveness, and employee recognition. All these studies point to the fact that the age group of 31-50 is especially in the best position to appreciate and embrace e-procurement tools, due to

the acquired professional background and preference to embrace innovations that can help improve the efficiency and productivity in the workplace.

Table 1: Demographic characteristics of study participants

Respondents from Universities	Number	Percentage (%)
Medical Universities	17	25.76%
Engineering Universities	13	19.70%
General Universities	36	54.54%
Profession of respondents	Number	Percentage (%)
Procurement Experts (Goods & Services)	50	54%
Procurement Experts (Works & Services)	32	35%
Financial Experts	10	11%
Age Group	Number	Percentage (%)
24-30 (Years)	8	03.03%
31-40 (Years)	43	48.48%
41-50 (Years)	26	31.82%
51 and Above (Years)	15	16.67%
Qualification	Number	Percentage (%)
Graduation	10	15.15 %
Master	42	63.64 %
M. Phil	09	13.64 %
Ph. D	05	7.58 %

The statistics show that 63.64% of the respondents have a Master degree, with 7.58% having a Ph.D. diploma. Previous studies have always shown that there exists a positive relationship between high educational levels and the use of technology in the procurement setting (Premathilaka & Fernando, 2020; Riddell & Song, 2017). However, research in developing nations argues that the scientific qualification of the procurement officials is not the key factor that negatively impacts adoption of e-procurement and instead the organizational resistance and the insufficient institutional backing (Savoldelli, Codagnone, & Misuraca, 2014). In turn, the current results confirm this claim: regardless of the availability of a well-educated workforce, bureaucratic inertia and administrative complexity remain substantive obstacles to the digital procurement system implementation.

4.2. Procurement Activities and the Persistence of Traditional Methods

The empirical evidence gained by the survey proves that in the procurement activities in the public sector universities of Sindh, the manual, paper-based processes disproportionately ruled the activities. Table 2 shows that 91.91% of the respondents have merely used traditional procurement practices, with only a fringe group (9.09%) admitting that they merely used digital tools partially. This excessive reliance on paper records reveals a gamut of operational limitations, such as long processing durations, data entry, long approval bottlenecks, and increased rate of documentation errors. These results are in line with the recent global literature on emerging-country procurement systems. Comparative analyses of Kenya indicate that similar trends of the traditional procurement practice are prevalent in the state universities even with the presence of digital solutions in place (Waithaka & Kimani, 2021). On the same note, a study carried out in Bangladesh reports that public-sector agricultural development projects continue to use manual systems thus face procurement challenges including regulatory inconsistencies, weak digital infrastructure, and change resistance (Hossain & Islam, 2021). Within the South African framework, Nzimakwe and Biyela (2021) note that despite the provisions of the constitution on fair, transparent, and competitive procurement practices, the actual application of the method is highly paper-based, leading to inefficiency levels.

Table 2: Procurement activities and procurement practices

Variables	Number	Percentage (%)
Procurement of goods & services	38	57.57
Procurement of works & services	19	28.79
Procurement of good, works & services	09	13.64
Total	66	100
Traditional purchase system	60	90.91
E-Procurement (Partial)	6	9.09
Total	66	100

The researchers Puschmann and Alt (2005) showed that organizations which had conventional procurement systems had a 40 per cent higher rate of error in processing as opposed to those who had automated solutions. Later works support the continuation of these trends at the world level. Gurgun et al. (2024) documented that traditional procurement continues to face challenges including unexpected order cancellations, large variations in material costs, and the uncertain nature requiring numerous changes. The current study thus supports global findings by documenting evidence from public sector universities in Sindh: institutional constraints along with non-implementation of adequate policies and support lead to outdated procurement practices and their sustenance despite efficient alternatives available through ICT solutions. Furthermore, as per SPPRA Rules, 57.58% of respondents were performing activities related to procurement of Goods & Services, while 28.79% respondents were performing activities related to procurement of Works & Services, and 13.64% respondents were performing activities related to procurement of Goods, Works & Services. Overall, most respondents have two major categories for procurement activities: works and services-related procurements (usually under the discretion of the project director or engineering wing), and goods and services-related purchases (mostly handled by the purchasing department). The findings point to the fact that the majority of the respondents argue that procurement operations are still rooted in traditional processes hence requiring innovative interventions to streamline the system. Interviews also indicate that, procurement procedures, which were entrenched in the institutional fabric of the university system in the public sector, have historically developed in accordance with conventional practices, as well as historical precedents. As a result, the processes remain as manual as ever despite the introduction of the digital technologies.

Although manual operations do have some merits i.e. the tactile verification of documentation, the cons far outweigh the pros. Mistakes of amounts, information of vendor, or lack of document during hand-written entries are the initiators of the inefficiencies in the form of prolonged lead times, high costs, and even a destroyed relationship with vendors. Rotich and Okello (2015) have also found that conventional procurement systems, which are based on physical verification, continue to face serious delays, inefficiencies, and inconsistencies in data entry culminating in non-optimal procurement results. Current comparative experience highlights the necessity of change. A study conducted on the adoption of e-procurement in the COMESA member states established that the adoption of the system increased by 30% to 70% in 2020 to 2024, hence, demonstrating the international transition to digital procurement (Gilbert & Celestin, 2025). The long-term nature of the still-used traditional procurement strategies consequently necessitates a complete change in the system of the work of the universities of the state system, which leads to the transition to more effective and digitized procurement systems. According to Ali et al. (2025), e-procurement system enables improvements in transparency, efficiency, and accuracy.

4.3. Procurement Correspondence and Communication Weaknesses

According to our findings, the procurement practices of the university institutions in the public sector still remain largely implemented by the traditional methodology. As indicated in Table 3, 39.39% of respondents rely on both traditional and email modes for procurement correspondence, while 25.76% rely only on traditional methods. Moreover, 19.70% use emails and portals, and 15.15% utilize both electronic and traditional methods to some extent.

Table 3: Correspondence and communication practices of respondents for procurement activities

Variables	Number	Percentage (%)
Traditional	17	25.76
Traditional & Digitally / Online	10	15.15
Traditional & Email etc.	26	39.39
Email & Digitally / Online	13	19.70
Total	66	100

These results suggest that participants perceive most activities in procurement in a traditional light, with minor use of modern Enterprise Resource Planning (ERP) systems. This is consistent with previous research pointing to the failure of conventional procurement processes in public sector organizations. Recent studies from African universities document similar patterns where institutions in the public sector tend to be averse to embracing electronic communication

channels, instead relying on paper-based and email correspondence, thus slowing down the procurement process (Nyaoga, 2025). Haddara and Elragal (2022) wrote that low adoption of ERP in an organization poses challenges in accelerating communication speed and effectiveness, thereby making procurement decisions slower and inefficient. Research from Jamaica revealed that procurement processes are moving gradually from clerical units to more efficient socio-economic units, though significant communication challenges remain in developing countries (Publishing, 2025). Abu Bakar et al. (2016) highlighted that traditional means of communication, for instance, letters and memos, provide actual records but take significant time, especially when quick decisions are needed. These delays can cause lost opportunities and damaged supplier relationships, especially in public procurement where timely decisions are crucial.

According to the recent international evidence, the importance of digital communication platforms is critical. The analytical research done in the Kenyan higher institutions of higher learning has indicated that electronic ordering is a major indicator of the effectiveness of the tendering process with a p -value of 0.001 showing that digital communication plays a significant role in increasing the efficacy of the procurement process (Waithaka & Kimani, 2021). Additional empirical studies on the Indonesian e-procurement systems emphasize the correspondence with the international best practices; still, there are significant issues in the area of providing transparency, user satisfaction, and effectiveness (Pandu Wicaksono, Urumsah, & Asmui, 2017). Comparative research from private universities in Nairobi found that electronic invoicing from suppliers allows error reduction ($M=4.398$, $SD=0.780$), confirming that e-communication helps eliminate manual data entry mistakes and enhances financial integrity (Wangui, 2025). Digital platforms streamline communication, facilitate data sharing, and improve visibility across the supply chain, with research demonstrating that e-sourcing increases transparency and accelerates procurement cycles (Musa, Jaafar, & Raslim, 2024). This therefore calls for a radical shift to digital procurement systems that are innovative and able to overcome the drawbacks of traditional practices. While manual procurement systems provide for physical verification, they often end up with many delays, inefficiencies, and inconsistencies in data that lead to poor procurement outcomes (Wangui, 2025). This persistence of traditional methods argues for the need for public sector universities to modernize their procurement systems toward more efficient and digital procurement, as e-procurement systems offer benefits in transparency, efficiency, and accuracy, thus proving indispensable for the betterment of procurement practices within public institutions (Gilbert & Celestin, 2025).

4.4. Challenges Identified in Traditional Procurement Systems

The study results confirm four broad challenge categories, consistent with literature and recent global evidence:

Technology-related challenges: Respondents reported that universities lack integrated digital systems to support procurement workflows. Manual documentation results in poor data quality, difficulty retrieving records, and reduced transparency. The results support the analysis by Wangui (2025) who argue that the traditional data management systems limit harmonization initiatives and, consequently, deter the overall performance of the operations. Empirical research over the past few years can testify to the fact that technological issues are still infusing the world arena. A study that was carried out in COMESA countries found that the lack of digital infrastructure was one of the main barriers, and the level of e-procurement adoption varied significantly due to infrastructural, regulatory, and fiscal obstacles (Gilbert & Celestin, 2025). Studies on e-procurement barriers also exposed insufficient ICT and internet infrastructure, lack of data security, and lack of technically trained ICT specialists as some of the most critical technology-related barriers in six geographical locations (Yevu, Yu, & Darko, 2021). The results of Bangladesh also report that the weakened technological infrastructure significantly undermines modernization efforts in the context of the development programs of the public sector (Hossain & Islam, 2021).

Process related challenges: Bureaucratic delays, redundant paperwork, slow some approvals, and extensive file transfer were mentioned by the respondents. These conclusions echo the global research on the importance of traditional procedural models in increasing processing times, bureaucracy, and other limitations in reducing efficiency in the procurement process. Empirical studies that have been conducted recently are showing that these procurement trends still persist. Research studies in the Kenyan higher education system have demonstrated that the decentralized character of the purchasing, combined with the barriers to

compliance, enables individual faculty and departmental organizations to take independent procurement actions, thus creating inefficiencies in their operation and blurring the visibility of their expenditure (Kiprotich Mutai, 2016). This was also observed in the research on procurement in South African state institutions, as the processes were defined by the absence of transparency and regulatory controls, and the deficiency of substantial institutional frameworks was revealed (Nzimakwe & Biyela, 2021). When comparing it to the studies of Ethiopian universities, it was highlighted that procurement planning has a considerable impact on the performance of organizations, thus highlighting the essential need to reduce the inefficiencies in the processes (Mola & Alemu, 2018). More research has found that the most notable barriers to effective procurement include the possibility of unanticipated order cancelations, the presence of significant material price variation, and inherently volatile nature of the industry that requires constant changes. In the same vein, a study conducted in Jamaica showed that procurement operations continue to shift to more advanced socio-economic units without strategic orientation, but with rudimentary clerical units; however, there are still major procedural challenges in developing countries (Nzimakwe & Biyela, 2021).

People related challenges: The main issues surrounding human factors include resistance to change, limited digital literacy and training deficiencies. The reaction of personnel to accept new technologies was continually recorded as aversion by respondents and is supported by recent literature defining the reluctance of entities in the public sector to oust the established manual processes. Modern global studies support the fact that employee resistance to change is one of the major barriers thus the tool to thoroughly train employees (Yu et al., 2015). One of the studies dedicated to procurement professionals in Tanzania found that they were not satisfied with their working conditions, and this factor was explained by the combination of multiple factors, including poor organizational culture, inadequate compensation plans, and lack of career progression opportunities (Changalima et al., 2023). Further research shows that the unwillingness to use new practices can often be explained by the lack of the necessary e-procurement skills, and the lack of the presence of technically/ICT-skilled employees has become a noticeable barrier in various geographic setting (Yevu, Yu, & Darko, 2021). However, there is recent evidence that chronological age has a central impact on technology receptivity. Empirically, middle-aged professionals (31 to 50 years) are in the best position to balance between experience accrued and predisposition to adopt digital tools that enhance performance in their jobs (Chan & Owusu, 2022; Zulkarnain, Muda, & Kesuma, 2023). The main barrier, though, is neither the level of educational attainment of personnel but institutional resistance and lack of strong support systems (Changalima et al., 2023). Research by the South Africans also indicates that the staff in the Supply Chain Management is characterized by lack of experience and skills with high turnover rates and low motivation, which significantly hinder the results of procurement (Mgidi & Kholopane, 2023).

Compliance-related challenges: The compliance concern is also introduced as a constant problem; in fact, various participants have pointed out the areas of incompliance with the prescribed laws of SPPRA, the absence of finality in the required documentation, and the inconsistencies in the application of stipulated procurement procedures. The idea that compliance issues remain rather urgent in the emergent economies is supported by cross-national comparative studies. In South African scholarship, an example of price inflation, award of the tender to family or acquaintances, non-disclosure of conflicts of interest by the bidders, absence of proper advertisement of the tender, and incompetent bid committees are documented (Munzhedzi, 2016). Similar studies of the Kenya public procurement system demonstrate that the situation is completely dark, and there is no regulatory framework to regulate the practices, which requires wholesome institutional changes (Nzimakwe & Biyela, 2021). As has been demonstrated in empirical data, in the context of public procurement, bureaucratic corruption is most prone, due to the lack of supervision tools, the insufficiency of deterring tools in the form of punitive sanctions, and the overwhelming bureaucracy of the integration that contributes to the inefficiency of the work (Locatelli et al., 2017; Obiri-Yeboah et al., 2025). Further studies in Bangladesh emphasize that inconsistency and gaps in the regulation and inadequacy of monitoring devices result in systemic compliance gaps in the development activities of the public sector (Hossain & Islam, 2021). Combined, these results confirm that the traditional procurement organization that is used in state universities is pathetically inefficient, anonymous, and does not align with the current regulatory principles. However, recent international research confirms that

the integration of the use of digital technologies into the procurement procedures can significantly increase the efficiency, transparency and accountability (Ning & Yao, 2023).

4.5. Respondent Profile Confirming Operational Challenges

Table 4 analysis shows that the large percentage of respondents had 11-15 years of experience in procurement (34.85%), then 16 years or more (24.24%). A smaller proportion indicated 1-5 years (22.73%) and 6-10 years (18.18%) which reflected that most had long experience. Such findings consequently suggest that the respondents are quite familiar with the complexity of the procurement processes of the public universities, such as the challenges that are often faced in practice. The level of experience that has been exhibited by the cohort is especially useful in the diagnosis of procurement challenges. It has been established that the professionals who have filed more than ten years of experience are in a better position to manage the complexity of procurement, particularly in the environment of the public sector with its complex regulatory framework and procedures development (Ayodeji Moshood, 2025). The investigations conducted recently also reveal that experienced procurement officers have a complex vision of the government regulation compliance, the supplier relationship management, and other important aspects of the procurement process (Changalima et al., 2023). On the other hand, empirical data shows that employees who have less than five years of experience are more susceptible to the barriers as they are still in the process of building the skills to be effective in the field of procurement management (Moses & Kalu O, 2018). Comparative research on African state organizations highlights the fact that the level of staff experience has a significant impact on their ability to overcome complex regulatory matrices and embrace new technologies (Mandala, Renson, & Kipketer, 2024). The respondents in the current study are thus well experienced to reach such findings and thus suitable to understand and respond to the issues surrounding the conventional and e-procurement in the government.

Table 4: Respondent's procurement experience

Respondent's Procurement Experience (years)	Number	Percentage (%)
01-05	15	22.73
06-10	12	18.18
11-15	23	34.85
16 & above	16	24.24
Total	66	100

4.6. Perceived Need to Replace the Traditional Procurement System

The current study has attempted to establish whether traditional purchasing systems that are in existence have a reason to be replaced. Table 5 indicates that 89.39% of the respondents agreed that the old purchase system needed to be replaced, 9.09 percent said no, and 1.52% said not at all. Respondents described the issues involved with the current system, namely, the longtime of files movement, the errors in their manual entry, the lack of transparency and the insufficient monitoring. The huge support that is in favor of the discarding of the conventional procurement apparatus shows that the existing processes are not only outdated but also do not go hand in hand with the modern governance requirements. Participants referred to the system as being slow, cost-inefficient, and error prone and out-of-date with the modern procurement requirements citing vendor complaints, challenges in tracking tenders, delays as a result of using manual note sheets, and document duplication.

This agreement is in line with the prevailing evidence throughout the world. Relative studies of Indonesian government procurement disclosed that the traditional systems require basic change to achieve transparency and efficiency criteria (Pandu Wicaksono, Urumsah, & Asmui, 2017). Research on procurement modernization in member states of COMESA reported the adoption of e-procurement as increasing between 30% in 2020 to 70% in 2024, as traditional system problems were being acknowledged (Gilbert & Celestin, 2025). A study of the public universities in Kenya established that 89.7% of the procurement professionals felt that e-procurement systems are very effective in enhancing transparency and efficiency over traditional procurement practices (Waithaka & Kimani, 2021). Similar results were obtained by South African researchers, where procurement professionals expressed overwhelming support in the idea of digital transformation to fill the gaps of the institutional framework and improve service delivery (Nzimakwe & Biyela, 2021). The intense inclination to adopt e-procurements is characterized by the increased level of concern in the public sector about the long-standing deficiencies related to the customary purchasing habits. Recent evidence demonstrates that e-procurement

implementation yields substantial benefits including reduced processing times, improved transparency, enhanced compliance, and better resource utilization (Aqeel & Asim, 2019; Mélon & Spruk, 2020). Research examining cost-benefit analysis of e-government procurement found that initial investments yield substantial returns through operational efficiencies and reduced corruption vulnerabilities (Ning & Yao, 2023).

Table 5: Respondents perception about shift from traditional procurement to E-procurement system

Variables	Number	Percentage (%)
Agree	59	89.39
Disagree	06	9.09
No response	01	1.52
Total	66	100

It is recognized that the present analysis is descriptive and inferential in nature but remains wanting in explanatory depth. It must be noted that the hypothesized directional relationships depicted in the conceptual framework (Figure 1) are based on the theoretical propositions supported by the literature. It is recommended that the hypothesized relationships be empirically tested using Structural Equation Modeling (SEM) and Regression Analysis in future studies. The study's results can be related to the Institutional Theory, which suggests that organizations tend to follow norms and rules that have been established within the industry, even if such practices prove to be operationally inefficient. The persistence of manual procurement practices in Sindh's public university system, despite the acknowledged inefficiencies and the existence of digital alternatives, can be related to the concept of Institutional Isomorphism. To be more precise, normative isomorphism manifests itself in a way that administrative routines come to be integrated deep into the organizational culture, thus, making them difficult to change. This issue is complicated by coercive isomorphism. A nominal requirement to comply with the SPPRA regulations is apparent, but a similar requirement is notably missing with respect to the digital infrastructure; therefore, paper-based solutions may continue to exist in a supposedly controlled environment. Analyzing the research findings in the wider framework of governance by the masses, it is possible to see the apparent gap between the intended purpose of governance and its practical implementation. While the PPRA and SPPRA systems ostensibly place transparency and efficiency at the heart of regulatory practice, there is no incentive for universities to engage with digital systems. Theoretical lenses such as digital transformation theory serve to place the findings within an overarching framework and provide a more robust context within which the recommendations that follow are made.

5. Conclusions

The study shows that traditional procurement systems in public sector universities of Sindh face serious limitations in terms of outdated manual approaches, long approval times, resistance to change, low adoption of ICTs, and low compliance. The study found that an overwhelming majority of procurement professionals, 91.91%, use manual documentation. Close to 90% of procurement professionals face long procurement times and high human interference. Furthermore, 89.39% of procurement professionals believe that the system should be replaced. All these factors contribute to inefficiency and non-compliance with SPPRA.

Theoretically, this study makes a significant contribution to the public procurement governance literature by offering empirical data from the relatively neglected area of higher education in Pakistan. It validates and extends the propositions of the institutional theory in terms of the strength of normatively embedded practices in the face of acknowledged inefficiencies. The four-construct model of technology, process, people, and compliance provides a tool that can be replicated in other developing countries. For university administrators and policymakers at the HEC/SPPRA, the results of the research point to three critical management concerns: first, the imperative of requiring a baseline of digital infrastructure standards for university procurement units; second, the critical importance of developing training programs for ICT literacy among procurement staff; and third, the need for enhancing internal audit processes for regulatory compliance beyond formalistic processes.

At the policy level, these findings offer a compelling case for a phased transition to e-procurement in Sindh's public universities, supported by appropriate regulatory guidelines from

SPPRA and HEC. The international literature has shown conclusively that e-procurement can save time, improve transparency and traceability, and enhance compliance issues that need urgent attention in the Pakistani public sector. The experiences of other developing countries can offer a useful roadmap for a transition to e-procurement that can be replicated in the Pakistani context. Investment in digital infrastructure can be a priority area for policymakers.

5.1. Limitations

Despite providing valuable insights into the challenges of traditional procurement in public sector universities, this study has several limitations that should be acknowledged. First, the study relied on self-reported survey data, which may be subject to respondent bias or over/underestimation of certain challenges. Second, the sample size was limited to 66 valid respondents from 27 universities, which may restrict the generalizability of findings across all public universities in Pakistan.

Third, the study examined only the perceived challenges of traditional procurement, without a detailed quantitative assessment of time delays, cost overruns, or error rates. Fourth, the study was conducted in Sindh province, and findings may not be directly generalizable to other provinces with different administrative contexts. Finally, the study did not include comparative analysis with universities that have implemented or are implementing e-procurement systems.

Another limitation with regard to methodology is related to the issue of common method bias. The issue could have arisen since all the variables are measured from the same source: procurement professionals. This could have an impact if not taken into consideration. However, since the study ensured that the responses from the participants were anonymous in order to avoid social desirability bias, other researchers could consider other sources such as multiple informants and/or surveys and documentation analysis. The cross-sectional design used in this study limits the ability to make causal claims. A longitudinal design would have been more effective in this case.

Future research could address these limitations by including larger sample sizes, multiple case studies, comparative analysis between traditional and e-procurement systems, and objective performance metrics to complement self-reported data. A longitudinal study that carefully traces the performance of procurement prior to and after adopting e-procurement system would produce invaluable results on the actual impact of digital transformation. Furthermore, qualitative research on the factor of organizational resistance and change-management strategies would be used to supplement and put these quantitative results into perspective.

5.2. Recommendations

According to the results and trend throughout the world, Sindh based universities in the public sector should shift its manual procurement system to complete integration e-procurement system. To successfully achieve this transition, we need to come up with an intervention strategy that comprises of an infrastructure component, a capacity-building component, and a governance component. This intervention plan is to be set in three phases.

5.2.1. Short-Term Reforms (0–12 months)

1. Implement a thorough audit of the procurement systems in all the twenty-seven universities thus developing a baseline of ICT infrastructure and also the needs which have to be met in the near future.
2. Design and implement specific ICT literacy/e-procurement training for existing procurement staff, in collaboration with HEC.
3. Mandate digital record-keeping of all procurement correspondence in compliance with SPPRA's minimum standards.

5.2.2. Medium-Term Reforms (1–3 years)

1. Develop and pilot an integrated e-procurement solution for 3 to 5 universities, following the success stories from various COMESA countries and Kenya (Gilbert & Celestin, 2025; Waithaka & Kimani, 2021).
2. Develop a centralized data repository for all procurement data to be accessible to SPPRA for monitoring and auditing.

3. Develop key performance indicators (KPIs) to measure the efficiency of the procurement process.

5.2.3. Long-Term Reforms (3–5+ years)

1. Scale e-procurement systems for all public universities in the Sindh province, ensuring interoperability with the financial management systems of the provincial government.
2. Establish e-procurement as a specialized profession within the universities, offering competitive salaries.
3. Arrange for independent evaluation of the e-procurement results at 3-year and 5-year intervals to measure the returns on investment and policy congruence.

Strong commitment of leadership and adaptation of best practices in similar developing countries will be essential in ensuring that sustainable, transparent, and efficient procurement reforms are achieved in this transition process.

5.2.4. Data Availability Statement

The data is available upon request from the corresponding author.

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