BEYOND TRADITIONAL PRACTICES: INVESTIGATING CUTTING-EDGE E-PROCUREMENT INITIATIVES FOR CONTRACTOR SELECTION IN PUNJAB PAKISTAN CONSTRUCTION INDUSTRY – A CASE STUDY OF PUBLIC SECTOR CLIENTS

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ABSTRACT

Objective: This research is carried out to assess the current status of e-procurement initiatives and the barriers the Pakistani construction industry faces in implementing e-procurement. The research gap in this study pertains to the lack of comprehensive research on e-procurement operations, particularly within the construction industry in Pakistan. This study is to examine and assess the existing e-procurement initiatives in the construction industry, focusing on their implementation scope and the degree of acceptability of digital technologies. The aim is to address the existing knowledge gap in this area and examine the viewpoints and attitudes of key stakeholders in relation to the implementation of e-procurement. Additionally, it seeks to identify barriers that are particular to the context and hinder the successful implementation of e-procurement. This study aims to assess procurement sector employees' familiarity with the e-procurement system.

Research Method: Through a comprehensive investigation of the identified barriers, this study sheds light on the issues impeding the successful deployment of e-procurement practices. Using survey data collected from public sector employees, the study presents its findings through a variety of charts and analyses.

Findings: The results reveal that 39% of respondents were fully aware of e-procurement systems, while 61% had a limited understanding. To improve their knowledge in this area, more awareness and training are needed. Electronic procurement has used e-tendering, e-sourcing, and e-informing less. With 36% use, SAP Ariba was the most popular e-procurement software. Khareed.pk had the lowest usage, at 6%. Respondents utilized purchase order and vendor management software. Electronic bidding has become the standard way of submitting proposals, signaling a shift towards digital procurement. 56% of respondents said e-procurement worked. 36% found it extremely effective. E-procurement was doubted or difficult for 8%. This study offers important insights into the implementation and utilization of e-procurement initiatives in Pakistan's construction industry.

Originality: This study's findings can serve as a valuable resource for policymakers, construction firms, and other relevant parties interested in advancing e-procurement practises in Pakistan.

Keywords: E-Procurement, Barriers, Public Sector Clients, Contractor

1. INTRODUCTION

Pakistan's construction sector is vital to the country's progress and prosperity. E-procurement is a game-changing strategy that has evolved as a result of developments in information technology. E-procurement, or electronic procurement, is the practice of using digital infrastructure and resources to improve the effectiveness of the purchasing process (Li et al., 2015). Transparency, reduced costs, and improved cooperation are some of the potential benefits of this digital transition for the construction business. The advantages of e-procurement initiatives have attracted a

lot of interest from across the world. E-procurement has been found to improve procurement efficiency and reduce waste, which in turn saves money and boosts output. As reported by (Aqeel, A., & Asim, M., 2019). Better supplier management is made possible by e-procurement systems, which also provide a more open and honest setting for all procurement deals (Djebarni & Benamar, 2018). In light of these merits, numerous nations have adopted e-procurement systems for use in industries like construction.

The construction sector is vital to the economic growth of Pakistan. E-procurement processes have proliferated in recent years across a wide range of businesses, including the building sector. Compared to traditional procurement techniques, e-procurement provides a variety of benefits, including cheaper overhead, more productivity, and enhanced accountability and transparency. However, a variety of barriers prohibit the construction sector from adopting e-procurement widely. This has been shown (Isikdag et al., 2011) to be the case. E-procurement is becoming more popular among businesses as a means of accelerating contract administration, proposal soliciting, and material sourcing. Construction organizations may boost production, decrease paperwork, and improve cooperation by digitizing these operations (Afolabi et al., 2019). A study is still needed to ascertain the extent of familiarity with and adoption of e-procurement operations in Pakistan's construction sector, study is still needed. In order to pinpoint problems, deficiencies, and improvement possibilities, It is crucial to assess the state of e-procurement in Pakistan's building industry. By analyzing the degree of awareness about e-procurement technologies among employees in the procurement industry, this research aims to add to the body of knowledge and provide practitioners and policymakers with essential information. In this post, we'll look at the challenges facing e-procurement in Pakistan's construction sector. We want to show how difficult it is for construction firms and other organizations to establish e-procurement processes by looking at these roadblocks.

2. LITERATURE REVIEW

The literature review offers a thorough overview of the knowledge and research that have been done on e-procurement in the construction sector, with an emphasis on its advantages, difficulties, and earlier study done in Pakistan. The review seeks to place the current work into the larger context of research.

2.1 ADVANTAGES OF E-PROCUREMENT IN THE CONSTRUCTION INDUSTRY

E-procurement has drawn a lot of attention as a revolutionary technology for the construction sector. It offers a variety of advantages, such as increased effectiveness, cost savings, and transparency (Farzin and Nezhad, 2010). Construction organizations may simplify procurement procedures, expedite communications, and improve stakeholder participation by using technology and electronic platforms. The use of e-procurement initiatives also improves accountability and transparency. By ensuring improved visibility and traceability of procurement transactions via the use of digital platforms and technologies, corruption and favoritism are less likely to occur (Ibem & Laryea, 2015). Furthermore, e-procurement improves supplier management, allowing businesses to build and maintain strong relationships with their suppliers (Nawi et al., 2017).

E-procurement is a recognized transformational strategy that has several advantages for the construction sector. Improved procurement process efficacy and efficiency are two important benefits. E-procurement solutions speed up the processing of procurement operations by minimizing manual paperwork and streamlining the procurement cycle (Ibem et al., 2016). Time is saved, expenses are decreased, and productivity is raised as a result. E-procurement solutions can facilitate data-driven decision-making by giving real-time access to analytics and

procurement information. Organizations may use this to measure performance metrics, assess trends in procurement, and pinpoint opportunities for process improvement (Hashim et al., 2013). E-procurement has the ability to boost operational effectiveness, encourage openness, and boost the performance of the construction sector as a whole.

2.2 CHALLENGES OF E-PROCUREMENT IN THE CONSTRUCTION INDUSTRY

Despite the fact that e-procurement has many advantages, there are still difficulties in its application in the construction sector. Cultural barriers and people's unwillingness to adapt are obstacles to the adoption of new technology (Aduwo et al., 2016). It may be challenging to make the switch to e-procurement platforms since construction businesses often have established procurement procedures and workflows.

The integration of e-procurement platforms with current enterprise resource planning (ERP) systems presents another difficulty. For data synchronization and effective procurement procedures, seamless integration is essential (Nawi et al., 2017). As sensitive procurement information must be shielded from unwanted access, it is also important to ensure data security and privacy in e-procurement systems (Owolabi et al., 2019). Finding trained personnel and appropriate training programs for the use of e-procurement is another challenge. Organizations need employees with technical expertise and an understanding of e-procurement systems to make the most use of the available tools and technology (Ahamed et al, 2010). Finally, for smaller construction firms with limited financial means, the expense of developing e-procurement systems and maintaining infrastructure may provide a challenge.

2.3 PREVIOUS STUDIES ON E-PROCUREMENT IN PAKISTAN'S CONSTRUCTION INDUSTRY

Several studies have looked at how well e-procurement programmes are accepted and how well they work in the building business in Pakistan. These studies give information about the current state of e-procurement and point out specific things that affect how it is used. Mathenge and Wausi (2018) did a thorough study of the literature about how e-procurement is used in the building business. The study discovered that a variety of elements, including corporate culture, legal requirements, technological infrastructure, and supplier readiness, have an impact on the acceptance of e-procurement. The results showed that encouraging people to use e-procurement tools requires good rules and plans.

Isikdag et al. also looked at the pros and cons of using an e-procurement method in Ghana's building industry in 2011. Even though the study is about Ghana, it has useful information that can help the building business in Pakistan. The research outlined key determinants of e-procurement adoption, such as top management support, perceived value, and compatibility with existing systems. The paper also highlighted the potential benefits of e-procurement for improving supplier relationships while saving time and money. Gunesekaran and Ngai (2008) have done a thorough review of the literature on the use of e-procurement in the construction industry of developing nations. The research highlighted factors including infrastructure, corporate culture, trust, legal and regulatory frameworks, as well as facilitators and hurdles to e-procurement adoption. The results highlighted how crucial it is to solve these issues in order to support effective e-procurement deployment. The global and local issues affecting the adoption of e-procurement in the construction sector in Pakistan. Eei, Husain, and Mustaffa (2012) conducted research on the factors affecting e-procurement adoption in Pakistan's construction sector. Their research made it abundantly clear how crucial factors like organizational readiness, benefit perception, and the potential for senior management support in e-procurement adoption are.

Similar to this, Ahamed et al. (2010) conducted a case study in Pakistan to identify the important factors impacting the adoption of e-procurement in the construction industry. Their research emphasized the necessity of government support, knowledge of current rules and regulations, and system integration amongst stakeholders as major factors influencing the successful implementation of e-procurement. These previous studies provide valuable insights into the adoption and challenges of e-procurement in the construction industry, both globally and in the context of developing countries. However, to understand the existing situation, the efficacy of e-procurement programmes, and the degree of expertise, further study is required, especially focused on the construction industry in Pakistan.

2.4 BARRIERS TO THE CONSTRUCTION INDUSTRY IN PAKISTAN'S ADOPTION OF E-PROCUREMENT

Considering the research's goals and the literature review, the following barriers have been identified in the adoption of e-procurement in the construction industry of Pakistan as listed in Table 1.

These barriers encompass various aspects, including organizational factors (e.g., management support, policies, training), technological limitations, financial constraints, trust issues, awareness gaps, the legal framework, and geographical challenges. These results show that successfully removing these barriers is necessary for e-procurement to be used successfully in the Pakistani construction industry. Overcoming these challenges will pave the way for improved efficiency, transparency, and collaboration within the construction procurement process. In the next parts of this study paper, we will look at these barriers in more depth and provide suggestions on how to lessen their impact on the usage of e-procurement in Pakistan's construction industry.

3. PROBLEM STATEMENT

In Pakistan, the procurement procedures for the construction industry face various difficulties. Initiatives in e-procurement have come to light as viable remedies in recent years. To what degree e-procurement will be used and how that will affect Pakistan's construction industry are yet unknown. Despite the increasing prevalence of digitization across diverse sectors, the construction industry in Pakistan has shown a comparatively sluggish pace in embracing electronic procurement strategies. The construction sector has significant importance in the economic landscape of Pakistan, necessitating the implementation of effective procurement strategies to foster its expansion and progress. The construction business often relies on conventional procurement techniques that rely on manual and paper-based procedures. These systems have been associated with inefficiencies, delays, and the possibility of corruption. E-procurement has the potential to enhance the efficiency of procurement processes, diminish transaction costs, enhance transparency, and foster equitable competition among suppliers and contractors.

Nevertheless, despite the potential advantages, the implementation of e-procurement in the construction sector of Pakistan has encountered numerous challenges. These problems may include a variety of difficulties or barriers. Technological barriers include several factors that may impede the adoption of digital procurement platforms inside construction organizations. These factors include limited access to technology, inadequate understanding of e-procurement systems, and apprehensions around data security and privacy. Organizational challenges that hinder the implementation of e-procurement systems inside construction organizations include resistance to change, insufficient digital skills and training among procurement staff, and poor integration of these systems with existing organizational procedures.

Table 1: Mapping of Attributes of previous studies on e-procurement

Attributes	Lack of interest of top management.	Lack of policy on e-procurement.	Lack of training regarding the implementation of e-procurement.	Lack of implementation of information technology in contractor.	Poor motivation towards adoption of change & innovation.	Lack of the belief between organizations in the e procurement.	I Inadequate Financial Resources of Small and Medium Organizations..	Lack of awareness related to e-procurement in construction sector.	Lack of system integration between suppliers and business partners.	Lack of experience in e-procurement..	Difficulty in understanding e-procurement application.	limited engagement from the necessary stakeholders through electronic channels	Broader usage in print media and conventional forms of advertising	Absence of electronic procurement structure in some stakeholder organizations.	Difference in e-procurement implementation level stakeholder organizations.	Insufficient responsiveness to user complaints and requests..	Concern about unauthorized access to crucial project information.	Insufficient governmental backing for e-Procurement.	Security and authentication of transactions.	Security reason for user identity.	Unavailability of Law/Regulations for e-procurement.	Lack of awareness to existing law/regulations related to e-procurement.	Very remote site location.
Afolabi et al (2019)	✓	✓	✓			✓						✓										✓	
Tutu et al (2019)		✓																			✓		
Mathenge & Wausi (2018)	✓		✓				✓								✓								

Nawi et al (2017)	✓								✓							✓							
Ibem et al (2017)	✓						✓																
Altayyar and Kerridge (2016)						✓												✓	✓		✓		
Nawi et al (2016)	✓								✓									✓					
Eadie, Perera, and Heaney (2010)											✓						✓		✓	✓			
Eadie et al (2007)	✓																		✓		✓	✓	
Isikdag et al (2011)	✓							✓					✓				✓					✓	
Aduwo et al (2016)			✓	✓							✓			✓				✓					
Ibem et al (2016)					✓		✓							✓		✓						✓	
Ibem & Laryea (2015)			✓	✓	✓	✓					✓								✓			✓	
Ahamed et al (2010)		✓								✓											✓		
Teo, Lin, & Lai (2009)	✓								✓					✓									
Egbu, Vines, & Tookey (2004)			✓																			✓	
Perera (2006)																			✓		✓		
Premathilaka & Fernando (2018)	✓			✓					✓	✓													

Laryea et al (2014)		✓					✓			✓					✓				✓				
Rankin et al (2006)	✓								✓													✓	
Afolabi et al (2017)				✓	✓																	✓	
Mastor & Onn (2010)	✓																						
Eei, Husain, & Mustaffa (2012)			✓	✓			✓				✓				✓						✓		
Zunk et al (2014)					✓					✓												✓	
Gunesekaran & Ngai (2008)	✓						✓												✓				
Stephenson & Chia (2006)				✓			✓						✓										
Farzin & Nezhad (2010)										✓													
Li et al (2015)									✓	✓													✓
Ibem et al (2017)																						✓	
Aduwo et al (2017)	✓																						
Obat (2016)									✓														
Owolabi et al (2019)											✓												
Frequency	**13**	**4**	**7**	**7**	**4**	**4**	**7**	**1**	**7**	**6**	**5**	**1**	**2**	**2**	**4**	**2**	**2**	**3**	**7**	**1**	**7**	**10**	**1**

Financial limitations include Construction enterprises, especially smaller ones, may see the initial expenditures related to the adoption of e-procurement systems, including software, hardware, and training costs, as being restrictive in nature. Regulatory and legal factors pose challenges to the adoption of digital procurement techniques within the construction sector. The presence of ambiguities in the legal framework around e-procurement, compliance difficulties, and uncertainties over the legitimacy of electronic signatures and contracts may deter stakeholders from fully adopting these digital procurement methods. Cultural factors may exert influence on the construction business in Pakistan, perhaps manifesting in entrenched conventional practices and connections that impede the adoption of digital platforms and perpetuate the existing state of affairs.

In order to successfully tackle these problems, it is necessary to do a thorough evaluation of the current state of e-procurement activities within the construction sector of Pakistan and get a deeper understanding of the underlying challenges that impede its broader implementation. This study seeks to analyze the barriers hindering the implementation of e-procurement practices in the construction sector. By identifying these barriers, the study aims to offer recommendations and insights to policymakers, construction industry stakeholders, and technology providers. The purpose is to facilitate and promote the successful adoption of e-procurement practices in the construction sector, thereby fostering its growth and development in the digital era

4. METHODOLOGY

This study involves four steps as:

- **Literature Review:** To start, a thorough review of the literature was conducted to ascertain the pros and cons of implementing electronic procurement in Pakistan's construction sector.
- **Semi-Structured Interviews:** 36 professionals were interviewed in a semi-structured way to find out the important current status and barriers to the use of e-procurement in Pakistan's construction business.
- **Data Collection:** Data was gathered from clients in the public sector using a questionnaire form.
- **Data Analysis:** The SPSS 20 programme was used to analyse the data first questionnaire survey included brief demographic questions such as name, designation and the experience. In addition, it involved the identification of the HRM practices in the government building construction organizations along with their ranking. The second questionnaire had the same demographic questions as in the first questionnaire. However, the second questionnaire involved additional demographic and other questions necessary for the data collection.

A total of 36 forms were completed and sent to different public sector organisations. Nominal variables and ordinal variables are two different sorts of categorical categories that are included in the survey data.

- **Nominal variables**: The kind of variable used to categorize respondents' attributes, such as organization type, projects, project delivery methods, etc. Separate data for each question that needed a "Yes" or "No" response is also included in this data format.
- **Ordinal variables:** The category of variable that holds the rank of the answer sequence. 'Yes' or 'no' are the only options for the survey questions. If the response is "yes," it is graded from "strongly disagree" to "strongly agree" on a scale of 1 to 5. The majority of these questions are about the respondents' present e-procurement activity. The collected data was analyzed using the software "SPSS" for Windows. The mean, standard deviation, and ranking were derived using descriptive analysis from the responses of the respondents

5. DATA ANALYSIS AND RESULTS

5.1 DEMOGRAPHIC PROFILE OF RESPONDENTS

Table 2 presents the demographic profile of the respondents, including their roles, years of experience, and organizational affiliations. The majority of the respondents were procurement sector employees with varying years of experience in the construction industry. This diverse representation ensured a comprehensive understanding of e-procurement initiatives across different organizational contexts.

Table 2: Working Position Type

S. No	Demography	No. of Respondent
Working Position		
1	Sub Engineer	23
2	Executive Engineer (XEN)	5
3	Sub-Divisional Officer (SDO)	5
4	MOI	1
5	AMOI	1
6	Assistant Engineer (AEN)	1
Experience		
1	06 to 10 years of experience	31
2	11 to 15 years of experience	5

5.2 OVERALL UNDERSTANDING OF E-PROCUREMENT SYSTEMS

The respondents were asked to mention their level of understanding regarding E-procurement system. The response of the practitioners is summarized as in figure 1.

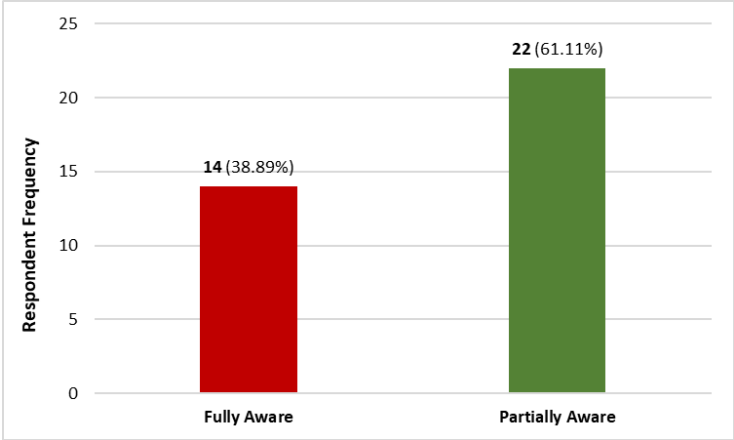

Figure 1: The level of knowledge of the electronic procurement system

Figure 1 shows that 38.89% of the respondents, or 14 out of 36, were completely aware of e-procurement systems, while a significant proportion (61.11%) had only a partial understanding, suggesting the need for further awareness and training programs in the industry.

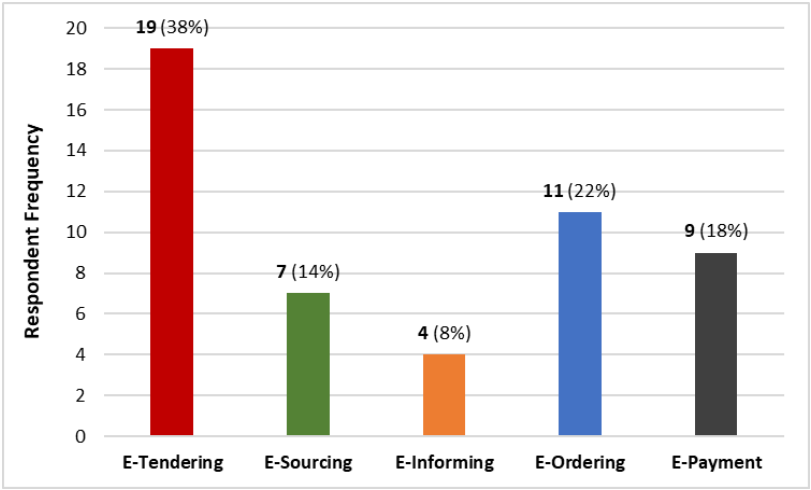

Figure 2: Activities perform electronically

Based on Figure 2, E-tendering was the most commonly performed electronic procurement activity, with 19 respondents (38%) selecting it. E-sourcing and e-informing were the least common, with 7 and 4 respondents respectively selecting them. This suggests there is room for improvement in the utilization of electronic procurement activities beyond e-tendering.

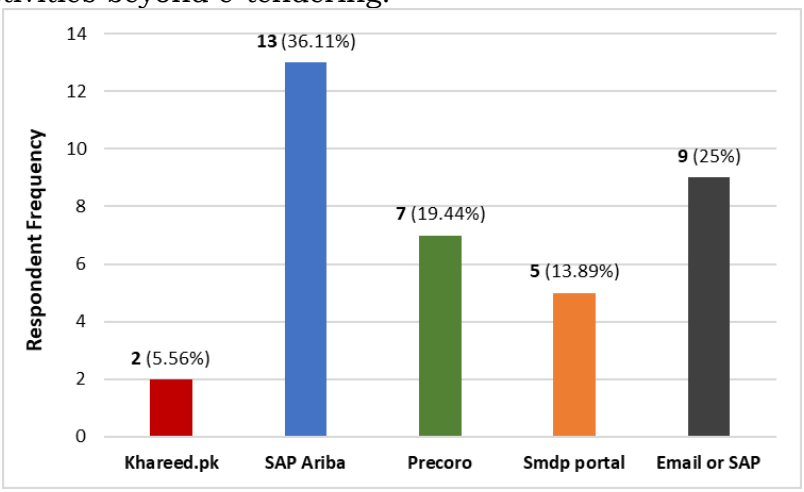

Figure 3: Tool/Software used for e-procurement

Figure 3 points out that the most commonly used software tool for e-procurement in Pakistan is SAP Ariba, with 13 respondents (36.11%) selecting it. Khareed.pk is the least commonly used tool, with only 2 respondents (5.56%) selecting it. This suggests that SAP Ariba is popular in the Pakistani construction industry.

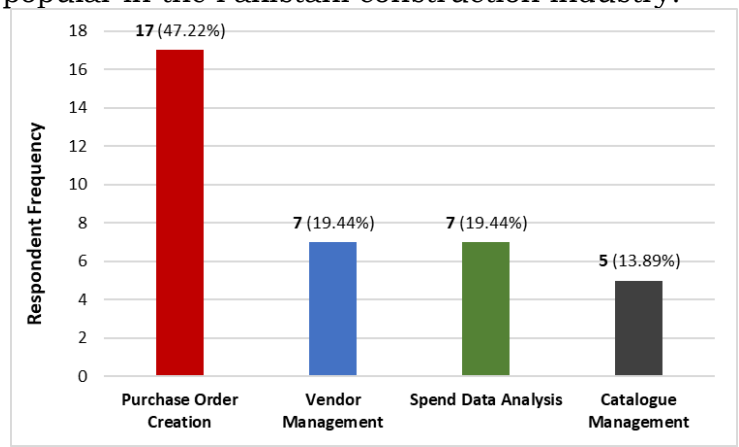

Figure 4: Software function mostly used by your organization/Firm

Figure 4 highlighted that Purchase order creation is the most commonly used software function, with 17 respondents (47.22%) selecting this option. Vendor management is the second most commonly used option, with 7 respondents (19.44%) selecting this option. These results highlight the importance of purchase order creation and vendor management as key software functions in the procurement processes of organizations in the Pakistani construction industry.

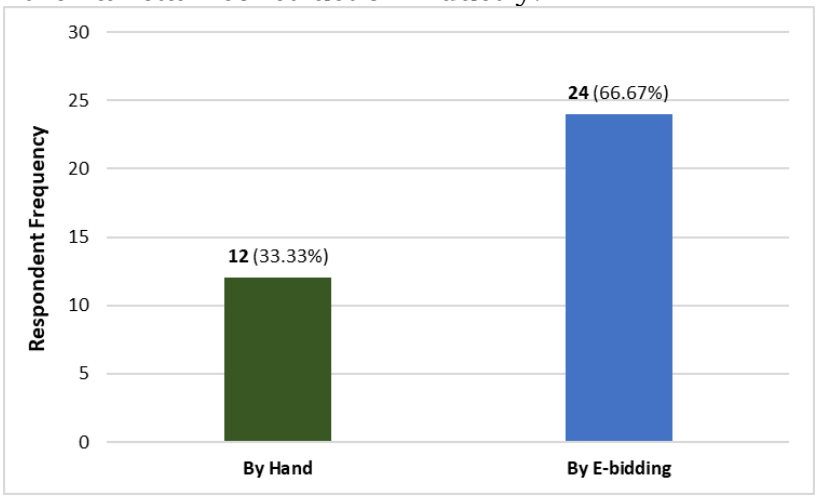

Figure 5: Method used for bid submission

Figure 5 shows that the most popular bid submission method in the construction industry is e-bidding, with 24 respondents (66.67%) using this electronic approach. 12 respondents (33.33%) still rely on the traditional method of submitting bids by hand. This indicates a shift towards digital procurement practices, reflecting the industry's shift towards digital procurement practices.

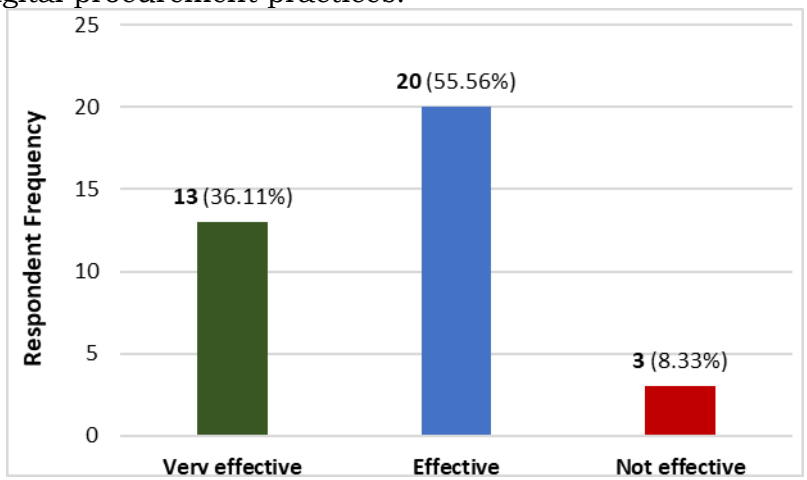

Figure 6: Use of e-procurement in the construction industry

As pointedout in Figure 6, the respondents' opinions regarding the benefits of e-procurement in the construction sector, with 20 of them (55.56%) believing it is effective and 13 (36.11%) believing it is very effective. However, a small proportion (8.33%) expressed the opinion that e-procurement is not effective, suggesting some skepticism or challenges in its implementation.

5.3 BARRIERS TO E-PROCUREMENT ADOPTION

The study's conclusions point out many key barriers preventing Pakistan's construction sector from adopting e-procurement. The following list of barriers is accompanied by the mean and standard deviation ratings for each one. The identified

barriers can be categorized into four main dimensions: organizational factors, technological limitations, financial constraints, and external factors

Table 3: Barriers to E-Procurement Adoption in Pakistan's Construction Sector

Sr.No.	Barriers	Mean	S.D	Rank
1	Lack of interest of top management.	3.5000	.91026	13
2	Lack of policy on e-procurement.	4.7222	.45426	1
3	Lack of training regarding the implementation of e-procurement.	2.3611	.93052	22
4	Lack of implementation of information technology in contractor.	3.9722	.81015	6
5	Poor motivation towards adoption of change & innovation.	2.2500	.87423	23
6	Lack of the belief between organizations in the e procurement.	4.0278	.65405	4
7	Inadequate Financial Resources of Small and Medium Organizations.	3.0000	1.01419	17
8	Lack of awareness related to e-procurement in construction sector.	2.4722	1.13354	20
9	Lack of system integration between suppliers and business partners.	3.8611	.99003	8
10	Lack of experience in e-procurement.	3.6389	1.04616	10
11	Difficulty in understanding e-procurement application.	3.0556	.82616	16
12	limited engagement from the necessary stakeholders through electronic channels	2.4167	.55420	21
13	Broader usage in print media and conventional forms of advertising	3.3889	.64488	14
14	Absence of electronic procurement structure in some stakeholder organizations.	4.0000	.89443	5
15	Difference in e-procurement implementation level stakeholder organizations.	4.5000	.50709	3
16	Insufficient responsiveness to user complaints and requests.	2.8889	.74748	18
17	Concern about unauthorized access to crucial project information.	3.6667	1.04198	9
18	Insufficient governmental backing for e-Procurement.	4.5278	.50631	2
19	Security and authentication of transactions.	3.5833	1.07902	11
20	Security reason for user identity.	3.5278	.97060	12
21	Unavailability of Law/Regulations for e-procurement.	3.9167	.80623	7

22	Lack of awareness to existing law/regulations related to e-procurement.	3.1389	1.33423	15
23	Very remote site location.	2.7778	1.33333	19

5.4 RELIABILITY TEST

Cronbach's alpha numbers were used to figure out how reliable the results from the interviewees were. The complete alpha number is derived by adding all of the barriers to e-procurement adoption. According to the table below, Cronbach's alpha, which is 0.809, is within the permissible range of 0.6 and 0.9

Table 4: Reliability testing of E-Procurement barriers

Cronbach's Alpha	N of Items
0.809	23

6. DISCUSSIONS AND IMPLICATIONS

The results of this research shed light on how Pakistan's construction industry is currently doing with

- **Organizational Factors:** Organizational aspects are connected to a number of barriers. A healthy corporate culture that values innovation and technical breakthroughs is needed, as shown by the lack of interest of top management (Mean: 3.5000) and poor motivation towards adoption of change and innovation (Mean: 2.2500). Lack of e-procurement policy (Mean: 4.7222) emphasizes the need of developing precise rules and structures to regulate e-procurement operations in the building sector. The lack of a formal training program for new hires in the construction industry has led to a rise in the number of companies offering online training courses. This may assist them in understanding the advantages and features of e-procurement systems and help them get over any concerns or questions they may have about using them.
- **Technological Limitations:** The lack of information technology adoption by contractors (Mean: 3.9722), the complexity of e-procurement apps (Mean: 3.0556), and the security and authentication of transactions (Mean: 3.5833) are some of the barriers connected to technical limits. The need for a better understanding of the world's most important issues is reflected in the fact that many of the world's most pressing issues are already being addressed.
- **Financial Constraints:** The use of e-procurement in the construction industry is significantly hampered by the inadequate financial resources of small and medium-sized businesses (Mean: 3.0000). This underlines the need of financial support systems and incentives to free up funding restrictions and allow smaller firms to invest in e-procurement systems.
- **External Factors:** External factors that have a significant impact on the adoption of e-procurement include insufficient governmental support for it (Mean: 4.5278), the absence of an e-procurement structure in some stakeholder organizations (Mean: 4.0000), and a lack of knowledge of the applicable legal requirements. To create a favorable environment for the implementation of e-procurement, it is necessary to address these concerns with the active participation and cooperation of governmental organizations, business groups, and regulatory agencies. The barriers that have been identified provide important light on the challenges that Pakistan's construction industry has encountered in implementing e-procurement operations. It need a comprehensive strategy that involves stakeholders at many levels to remove these barriers.

First, initiatives to raise awareness and create capacity are required to inform experts in the construction industry about the advantages, features, and implementation tactics of e-procurement systems. Training programs should be tailored to people at various organizational levels and provide them with the skills they need to accept and successfully use e-procurement. Second, to enable the use of e-procurement in the construction industry, policymakers and regulatory bodies should provide thorough regulations, guidelines, and legal frameworks. Insuring data security and privacy, establishing standards for system integration, and encouraging the use of electronic platforms for procurement procedures are a few of the things that fall under this category.

According to the recommendation, the use of e-procurement systems by small and medium-sized businesses should be supported financially. To remove financial barriers and promote greater involvement, this may include subsidies, grants, or low-interest loans. Lastly, government organizations, corporate organizations, and stakeholders must collaborate closely in order to promote the use of e-procurement. In order to address problems, discuss best practices, and create a network of support, this includes advocacy initiatives, information sharing platforms, and frequent conversations. Pakistan's construction industry may adopt e-procurement to enhance efficiency, transparency, and cooperation in procurement operations by tackling these barriers and executing the right techniques. Resulting in enhanced project results and industry expansion

7. CONCLUSION

The results of this research shed light on how Pakistan's construction industry is currently doing with e-procurement projects. The findings show that individuals in the procurement industry have varying levels of awareness, with a sizable majority having just a basic comprehension of e-procurement technologies. The most popular electronic procurement activity was found to be e-tendering, whereas e-sourcing and e-informing were less used. The most popular software tool was SAP Ariba, with the production of purchase orders being the most often used software feature. According to the majority of respondents, e-procurement was effective in the construction industry, and e-bidding was the preferred method for submitting bids. Policymakers, organizations, and industry stakeholders may benefit from the existing body of knowledge on e-procurement in the construction industry by getting insights that will help them increase the acceptance and efficacy of e-procurement projects. To effectively promote the adoption and utilization of e-procurement technology in Pakistan's construction industry, more study is advised to dive deeper into the issues encountered and create methods to overcome barriers.

The findings showed how well-aware personnel in the procurement industry were of e-procurement activities, how they were using it, what software they were using to submit bids, and how successful they thought it was. The findings provide perceptions on the status of e-procurement today and provide suggestions for enhancing its adoption and use.The implementation of e-procurement in Pakistan's construction industry is constrained by a number of issues, including organizational, technical, financial, and external barriers. Top management, lawmakers, industry groups, and regulatory agencies must work together to overcome these barriers. The construction industry in Pakistan can overcome these barriers and embrace e-procurement as a transformative tool for improving procurement processes by implementing the advised strategies, which include top management support, policy development, training and capacity building, technological advancements, financial support, and collaboration.It is essential to recognize that the successful adoption of e-procurement in the construction industry requires a long-term commitment, continuous monitoring, and periodic evaluation to address emerging challenges and adapt to evolving technological

advancements. By doing so, E-procurement may assist the construction sector in terms of efficiency, transparency, cost savings, and improved project results.

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