

## E-PROCUREMENT IN CONSTRUCTION INDUSTRY OF PAKISTAN: A CASE STUDY OF CONTRACTOR RELATED TO PUBLIC SECTOR PROJECTS

Raja Zulquarnain Nizakat\*<sup>1</sup>, Nafees Ahmed Memon\*<sup>2</sup>, Anees Ahmed Vighio\*<sup>3</sup>,  
Ahmed Mustafa\*<sup>4</sup>, Aamir Hussain\*<sup>5</sup>

\*<sup>1,5</sup>Post Graduate Student, Department Of Civil Engineering, Mehran University Of Engineering And Technology, Jamshoro, Sindh, Pakistan.

\*<sup>2</sup>Professor, Department Of Civil Engineering, Mehran University Of Engineering And Technology, Jamshoro, Sindh, Pakistan.

\*<sup>3</sup>Lecturer, Department Of Civil Engineering, Mehran University Of Engineering And Technology, Jamshoro, Sindh, Pakistan.

\*<sup>4</sup>Research Scholar, Department Of Civil Engineering, Mehran University Of Engineering And Technology, Jamshoro, Sindh, Pakistan.

### ABSTRACT

Construction industry is one of the key productions in Pakistan which symbolizes the country's GDP and works directly upon the workforce of the country. Procurement performs at the most important part into the worth deciding the total price and condition for the finished manufactured goods. Through the advancement as well as growth to the usage of IT, transferring to E-purchasing has come to be in the globe primarily for reason that of the advantages the situation gives the association/company. Popularly, the Pakistan maximum for an organization had initiated the utilization of E-ordering thoughtlessly not including that of expenditures or advantages results. the shortage of documents, miscommunication and incorrect comprehension stuck between the client and industry, numerous problems are being created on the construction site, which produces the postponement in time of project, enhances the cost of project. Typically, the deficient in training, lacks in payments and balance, and non-existence of specific information. Additional unnecessary cost and documentations, unethical traditions by vendors. The present study seeks to estimates that barriers for the make use of E-purchasing in construction industry and strives for the identification of the fences plus advantages upon the practice for the E-procurement. This study conducted by the use of information composed from organization that are presently under the use of E-procurement in conjunction with the intention of assisting to organization that have being development for the improvement of E-procurement in future. The objectives that have sated in study, of the research were accomplished by using SPSS software.

**Keywords:** E-Procurement, Contractors, Construction Projects Of Pakistan.

### I. INTRODUCTION

An electronic procurement may be called as e-procurement, is a systematical buying to any association dependent on certain (IT) Information Technology that is to be counted at the involvement sideways of the procurement. Current study has discovered that technologies knowledges not unlike e-procurement has tremendously incorporated in the enterprises and embedded along with other aspects for the improvement of organizational developments. Electronic procurement has been originally discovered by Global Public Procurement concentrating on the preliminary time of finding and throughout the procedure of engineering development. For modernizing the scheme to specialized productivity [8]. It is the internet that chiefly influence the industrial procurement systems, supply chain networking all the way through internet, procurement-based internet, and procurement through communities and centers on internet. In present exceedingly competitive environment, it is essential for every single association to sustain and maintain an inexpensive and successful procurement process to cut off managerial cost and to maintain well-informed of the market condition. To procure raw material and services at the right price, quality, quantity, and time. At its extremely fundamental, procurement in every field is approximately to balance out probability alongside compensation toward attain targets besides develop significance. [15] From project point of view, procurements techniques go away beyond procurement of supplies and customer services and can provide appropriately be contemplated an assistance composition to generate raw material link, i.e., each construction

project stands that one an insignificant industrial unit generating a minor solitary entity of item, and the procurement purpose happens to empower accomplishment inside the limitations of schedule, capacity of time, and financial plan. Any project is said to be “productive” if that drops inside the considerations of project though nevertheless producing the revenue to any contractors.

The conventional procurement technique on construction work is known as Design Build or Design-Bid-Build (DBB). In such a prototype, an engineer, or an architect, or together condescend a scheme and later exposed it intended for proposals as of concerned contracts via releasing application intended for the tender. The lowermost possible (dealer) purchaser will be capable on the way to convene the wants of any scheme is commonly presented the project. Then outworker knobs the finding of all things and facilities expected for the completion of specific project, preferably through an eye in the direction of the maximum level of excellence that correspondingly allocates for the cost-effective usage of the resources and wholesome turn a profit.

## II. LITERATURE REVIEW

The construction industry is very vital for the economy of a country, as it found and delivers infrastructure for essential economic areas. Most project owners use the traditional method, in which project all parties are involved in separate contracts [7]. The contractors are typically not involved until the designs have been completed. The World Bank stated in the summary of its report on the construction industry in developing countries, “the construction industry is an essential contributor to the process of development. It influences most, if not all, sectors of the economy. Roads, dams, irrigation works, houses, schools and others construction works are the physical foundations on which development efforts and improved living standards are established. To most developing countries, improving construction capacity and capabilities is important, including improving cost efficiency, timeliness, and quality of construction works” [10].

### Significance of E-procurement

The beginning and propagation of E-procurement techniques in the organizations has produced a large quantity of knowledge associated to both usage and performance. There are abundant studies delivering circumstantial indication to sustain the idea that e-procurement creates the procedure extra economical and successful and has an impression on corporation's accomplishment. The literature review illustrates the following benefits.

A growth in process quality, decreased procurement cost, user fulfillment, enhanced responsiveness, better-quality consumer service, product modernization, market enlargement, decline in procuring, cycle time, lessening in staff time, and administrative usefulness.

However, these empirical investigations require an understanding into an odd (singular) situation; they not succeed to stipulate a comprehensive and thorough list of assistances and accompanying expenses for the definite industry.

### Main forms of E-procurement

Many e-procurement systems could be illustrious in the literature review. Some of the followings are common forms.

#### 1. E-ordering

E-collection concentrate upon manner of establishing and supporting obtaining appropriations, identifying the briefings, and collecting the things besides facilities well-organized by means of a computer software technique centered going through net.

#### 2. Web based Enterprise Resource Planning (ERP)

Net-built initiative reserve preparation (ERP) is like e-collation, the solitary variance is it in event of web-based ERP the things and amenities are invention associated.

#### 3. E-sourcing

E-obtaining consents recognizing original-found providers to a definite kind of obtaining obligation manipulating net throughout specific restrictions.

#### 4. E-tendering

It is a method of transmitting RFP (Request for Proposal) and RFI (Request for Information) to provider and accepting their reactions.

**5. E-reverse auction**

It empowers the acquiring association to purchase goods and services looked-for from the contractor that has the bottommost set a price or amalgamation of lowest possible value.

**6. E-informing**

E-informing does not comprise transactions, but it manages congregating and distributing procuring knowledge mutually from external and internal companies.

**Barriers of E-procurement**

[6] Conducted a research study on “Barriers of implementing E-procurement” recommended that a corporation be able to utilize E-purchasing to generate planned benefit. He mentioned that the extent of barriers of implementing in e-procurement is the low rate of adoption. That minimal percentage of implementation happens towards the thorough catalog of obstacles designed for e-purchasing performance. The inventory comprises: cultural differences, hesitation as of contractors, probability, workforce fighting to switch, inventory matter skill, etc. Single reason meant for the minimal level of implementation might be that the application procedure of E-procurement happens extremely complicated besides that the major advantages of E-procurement could be attained simply in the prolonged period. [3] recognized obstacles particular toward the valuation procedure (manufacturing and governmental barriers) and near the transition method (resource, understanding, and control barriers) while employing an E-procurement form.

**Table 1:** Mapping of Barriers in adoption of E-procurement

Sr. No	Barrier in adoption of E-procurement in construction industry of Pakistan	[1]	[9]	[17]	[21]	[23]	[26]	[29]	[10]	[19]	[20]	[13]	[25]	[15]	[6]	[27]	[7]	[16]	[28]	[8]	[22]	Frequency
1	Weak infrastructure	√	X	√	X	X	X	√	√	X	X	X	X	X	X	X	√	X	X	X	√	06
2	Lack of government	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√	02
3	Security concern online payment and transaction	√	√	√	X	X	√	X	X	X	√	X	√	X	X	X	X	√	√	√	√	10

4	Mistrust in electronic fund transferring	√	√	√	X	X	√	X	X	X	√	√	√	X	X	√	X	√	√	√	√	12
5	High degree of risk	X	√	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	02
6	Uncertainties in dealing	X	√	X	X	X	X	X	X	√	√	X	√	X	X	X	X	√	X	X	X	05
7	Complexities in the curve of electronics	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	01
8	Lack of confidence	X	√	X	X	√	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	03
9	Lack of awareness	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√	X	X	X	02
10	Unsure to the legal position of procurement	√	√	√	X	X	X	X	X	X	√	X	X	X	X	X	√	X	√	√	√	08
11	Company culture	X	X	√	X	X	X	X	X	X	X	X	√	X	X	X	√	√	X	√	X	05
12	Upper management	X	X	√	√	√	X	X	X	X	X	X	X	√	√	X	X	X	X	√	X	06
13	Lack of E-procurement knowledge	X	√	√	X	√	X	√	X	X	X	√	√	X	X	√	X	√	X	√	X	09
1	Lack of	X	X	√	√	X	X	X	√	X	X	X	√	X	X	X	√	X	√	X	√	0

4	expertise																				7	
15	System problem	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	01
16	Employee resistance	X	X	X	√	X	X	X	X	X	X	X	X	X	√	X	√	X	X	X	X	03
17	Poor IT potential	√	X	√	√	X	X	√	√	X	X	√	X	X	X	√	X	X	√	√	√	10
18	Lack of regularity policy	X	X	X	√	X	X	X	X	X	X	X	X	X	√	X	X	X	X	√	√	04
19	Resistance to change	X	X	X	X	√	X	X	X	X	X	X	√	√	X	√	X	X	√	√	√	06
20	New technology	X	X	X	X	√	X	√	X	X	X	X	√	√	√	X	X	√	√	√	√	08
21	Lack of skilled person	X	√	√	X	√	X	√	X	X	X	√	√	X	X	√	X	√	X	√	X	09
22	High initial IT investment cost	√	√	√	X	X	√	X	X	X	√	X	√	X	X	X	X	√	√	√	√	10

**Benefits in adoption of E-procurement in construction industry of Pakistan**

Switching to and adopting online based procurement or e-procurement can promise any organization a great deal of benefits and advantages ranging from administrative costs or overheads, quality, and convenient and cost-effective purchasing processes to delivery time streamlining the sharing of necessary information, making it easier to keep track of purchasing budgets and incoming deliveries and helping business organizations to save more money. Industries, business organizations and of course governmental organizations and agencies have been constantly showing great interests in adopting e-procurement since researchers and analysts believe that adoption and utilization of online based procurement result in saving costs and efficiency in purchasing processes. [12] Cost effectiveness, transparency, and visibility across all procurement processes, streamlined purchasing procedures, and better internal and external relations are the main drivers for organizations to adopt and implement e-procurement.

According to [5], companies have been provided with entirely new business models since the internet and intranet first emerged which enables and allow organizations to collaborate externally with their most important suppliers at the same time by internally managing their demand proactively. Apart from internal winners that are the buyers, suppliers can also benefit a great deal and are ready to accept this business model

of e-procurement. [7] Suppliers can benefit through increased sales volume by providing e-catalogs, reduce sale costs by redefining the role of their salespersons, and reduce operating costs by minimizing the costs of reworking error prone manual orders, improve demand insight by making better forecasts about buyer’s demand, and last but not least, improve customer relationships by making a team network, being able to reduce overall procurement costs and strengthen their long-term relationships. The main point shall be noted that all these can be achieved through improved and strong information sharing allowed by e-commerce technologies. Thus, sharing volume of real-time and transparent information would be considered a powerful sourcing tool.

**Table 2:** Mapping of Benefits in adoption of E-procurement in construction industry of Pakistan

Sr. No	Benefits in adoption of E-procurement in construction industry of Pakistan	[15]	[22]	[4]	[18]	[19]	[9]	[5]	[8]	[6]	[20]	[21]	[25]	[16]	[26]	[13]	[7]	[16]	[28]	[27]	[14]	Frequency
1	Lower transaction cost	√	√	√	X	X	X	X	X	X	X	X	√	X	X	X	√	√	X	√	√	08
2	Better reporting through automation	√	√	√	X	X	X	X	X	X	√	√	X	√	X	X	X	X	X	√	√	08
3	Automatic pre-qualify submission and evaluation	√	X	X	X	X	X	X	X	X	√	√	X	X	√	X	X	X	X	X	X	04
4	Reduce tender cycle times	√	√	√	√	√	X	X	X	X	√	√	√	√	√	√	X	X	X	√	√	13
5	Automatic	√	√	X	√	√	√	X	√	√	X	√	√	√	√	√	X	X	X	√	√	1

	tendering																					4
6	Storage of documents	√	X	X	X	√	X	X	√	X	X	X	X	√	√	X	X	X	X	X	X	05
7	Savings and increase efficiency	√	√	√	X	√	X	X	X	√	X	√	√	√	√	√	√	√	X	√	√	14
8	Faster procurement	X	√	√	√	√	√	X	X	√	X	√	√	X	√	√	X	X	X	√	√	12
9	Higher transparency	X	√	√	√	X	√	X	X	X	√	√	√	X	√	√	√	√	√	√	√	14
10	Awarding process will be very organized and precise, save costs	X	√	X	X	X	X	X	X	X	√	X	X	X	X	X	X	√	√	√	√	06
11	Reduce labor intense	X	X	X	√	X	X	X	X	√	X	X	√	X	X	X	X	√	√	X	X	05
12	Recording of documents	√	X	X	√	X	X	X	X	X	√	X	X	√	√	X	X	X	√	X	X	06
13	Eliminates the need of multiple entries	X	X	X	√	X	X	X	X	√	X	X	X	√	√	X	X	X	X	√	√	06
1	Reduct	X	X	X	√	√	X	X	X	√	X	X	√	√	√	√	√	√	√	√	√	1

4	ion in errors																						2
15	Reduces disputes	X	X	X	√	√	X	X	X	√	X	X	√	√	√	√	√	√	X	√	√		11
16	Economies information	X	X	X	X	√	X	X	X	√	X	X	X	√	√	√	√	X	X	√	X		07
17	Enlarges market	X	X	X	X	√	X	X	X	X	X	X	X	X	X	√	X	X	√	X			03
18	Reliability performance	X	X	X	X	X	X	X	X	X	X	X	X	√	√	X	√	√	√	√	√		06
19	Adoption new technology	X	X	X	X	X	√	X	√	X	√	X	√	X	√	√	√	X	√	X	√		09

**III. PROBLEM STATEMENT**

Due to the shortage of miscommunication and incorrect comprehension stuck between the client and industry, numerous problems are being created on the construction site, which produces the postponement in time of project, enhances the cost of project [18]. Typically, supply chain is un-compliance, with industry, which is deficient in training, lacks in payments and balance, and non-existence of specific information. Additional unnecessary cost and documentations, unethical traditions by vendors (Muhammad Talib Uz Zaman is a Program Officer for CIPE Pakistan). E-procurement is the electronic procurement (online supply) of diverse raw-materials from the manufacturing productions to the construction site of the project [2]. E-procurement make it to simpler and comfortable of procurement and procuring process of any industry/corporation [11]. However, there are until some of the opposition to change over the way and implementation. Consequently, the significance of discovering is what e-procurement generates the benefit for the procurement in organization.

The above-mentioned issues may not be resolved completely but can be reduced to some extent by adopting e-procurement strategies. The challenges procurement staff stand facing when dispensing with construction are difficult, but not unbeatable. By integrating the right technology through a cooperative methodology and smart resource collection. It possibly will be a construction procurement approach that builds not simply following project, but resilient connection and consistent importance for the corporation or company or industry. Therefore, this research study is conducted to know the barriers in implementation of E-procurement and benefits of E-procurements.

**IV. METHODOLOGY**

**1. Literature Review**

Initially a rigorous literature review was conducted to identify the Barriers and Benefits in adoption of E-procurement in construction industry of Pakistan

**2. Semi-Structured Interviews**

Semi-Structured interviews of 29 professionals were conducted to identify the important benefits and barriers in adoption of e-procurement in Construction industry of Pakistan.



### 3. Data Collection

Data was collected by using a questionnaire form from private sector contractors.

### 4. Data Analysis

Data was analyzed by using SPSS 20 software.

## V. SURVEY PROCEDURE

About 30 questionnaire forms were filled to different Contractors organizations. Nominal variables and ordinal variables are 2 types of categorical variable which are included in the data collected from the questionnaire.

**Nominal variables:** The type of the variable which classify the respondents and their characteristics which include the type of company, projects, projects delivery systems, etc. This type of data includes also dichotomous data for any question that required ‘Yes’ or ‘No’ responses.

**Ordinal variables:** The type of variable which contains rank of the order regarding responses.

The questions in the survey contains questions having answer as ‘yes’ or ‘no’. If the answer is ‘yes’, then it is scored from 1 to 5 which means from ‘strongly disagree’ to ‘strongly agree’ respectively. Most of these questions are related to respondents’ activities regarding their current adoption of e-procurement. The data collected was analyzed with usage of software “SPSS” for windows. From the response of the respondents the average index, standard deviation and ranking was calculated with descriptive analysis.

## VI. DATA ANALYSIS AND DISCUSSION

**Table 3.** The working position of the respondents working in different organizations.

**Table 3:** Type of Working Position

S. No	Respondents Working Position	No of Respondent
1	Procurement engineer	9
2	Project Engineer	6
3	CEO	5
4	Executive engineer	4
5	General manager	3
6	Planning Engineer	2

**Table 4.** Experience of Respondent working in different organizations

**Table 4:** Experience of Respondents

S. No	Experience of Respondents	No of Respondent
1	4 to 7 years of experience	11
2	7 to 11 years of experience	1
3	11 to 15 years of experience	10
4	15 to 20 years of experience	4
5	Above 20 years of experience	3

### Barriers in adoption level of E-Procurement

The second part of the questionnaire is related with the barriers of e-procurement in the construction industry of Pakistan.

There were 22 barriers taken from literature review explained by the different researchers in their research work and were confirmed from the field experts by conducting the un-structured interviews. The Likert’s scale (1=strongly disagree, 2=disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree) was used to rank these barriers. The data was collected from 29 respondents (All are contractors) was analyzed by calculating their AI and standard deviation values and Rank.

**Table 5:** AI values and standard deviation of all the Barriers in adoption level of E-Procurement

S#	Barriers of E-Procurement	SD	AI	Rank
1	Weak Infrastructure of Organizations	0.862	0.724138	6
2	Security concern in online payment and transaction	1.053	0.682759	13
3	Mistrust in electronic fund transferring	1.072	0.662069	20
4	High degree of risk and cost involved	1.210	0.593103	22
5	Uncertainties in dealing with anonymous online relation	0.974	0.668966	15
6	Unsure to the legal position of E-procurement	0.850	0.662069	18
7	Lack of Upper management support	0.960	0.744828	2
8	Lack of E-procurement knowledge	0.996	0.744828	3
9	Immaturity in new technology	0.948	0.689655	12
10	System problem	0.942	0.675862	14
11	Employee resistance	0.911	0.703448	9
12	Poor IT potential	1.214	0.703448	10
13	Lack of organizational focus	0.891	0.662069	19
14	Resistance to change	0.827	0.710345	8
15	Conventional/Traditional culture of companies	1.233	0.668966	17
16	Confidentiality of information of an organization	1.271	0.696552	11
17	Lack of appropriate technology infrastructure	0.978	0.758621	1
18	Lack of training program for E-Procurement	0.930	0.737931	5
19	Lack of appropriate National policy on E-procurement	1.032	0.744828	4
20	Lack of knowledge regarding taxation related to E-commerce	0.942	0.724138	7
21	Lack of Skilled person	1.078	0.668966	16
22	High initial IT Investment cost	1.131	0.655172	21

From table 5, it is identified that 'Lack of Appropriate technology infrastructure' is the most important barrier among other barriers to adoption of e-procurement in Construction industry having the Average index value of 0.758621 followed by 'Lack of Upper management support' having Average index value of 0.744828. Lack of E-procurement knowledge Lack of appropriate National policy on E-procurement, Lack of training program for E-Procurement, are ranked as third, fourth and fifth most important barriers. From the results it is also identified that all the barriers are important to adoption of e-procurement in Construction industry because the last barrier "High degree of risk and cost involved" has Average index value of 0.593103 which indicates that all the barriers are important.

**RELIABILITY TEST**

The Cronbach’s alpha values calculated to check the reliability of the results obtained from the respondents. The collective alpha value is calculated for all the barriers in adoption of E-Procurement. The Cronbach’s alpha value of the collected data from respondents is 0.907 which are in between the acceptable range of 0.6 to 0.9 as shown in table below.

**Table 6:** Reliability test of barriers in adoption of E-Procurement.

Cronbach's Alpha	N of Items
0.924	22

**Benefits in adoption level of E-Procurement**

The third part of questionnaire is related with the benefits in adoption of E-Procurement in construction industry of Sindh. There were 19 benefits taken from literature review explained by the different researchers in their research work and were confirmed from the field experts by conducting the un-structured interviews. The Likert’s scale (1=strongly disagree,2=disagree, 3=Neither agree nor disagree, 4=Agree,5=Strongly Agree) was used to rank these benefits. The data was collected from 29 respondents (All are contractors) was analyzed by calculating their AI and standard deviation values and Rank. The table 7. shows the AI values and standard deviation of all factors.

**Table 7:** AI values and standard deviation of all factors of Benefits in adoption level of E-Procurement

S#	Benefits of E-Procurement	AI	Rank	SD
1	Lower Transaction Cost	0.717241	17	0.733
2	Better Reporting through Automation	0.724138	15	0.833
3	Automatic pre-qualify submission and evaluation	0.724138	16	0.942
4	Reduce tender cycle time	0.772414	7	0.875
5	Automatic schedule of tendering process	0.731034	13	0.769
6	Easier access to market	0.696552	19	0.911
7	Savings and increase in efficiency	0.793103	3	0.731
8	Faster procurement	0.8	2	0.802
9	Higher transparency	0.786207	4	0.753
10	Awarding process will be very organized and precise, save costs	0.765517	8	0.759
11	Better Recording of documents	0.806897	1	0.731
12	Eliminates the need of multiple entries	0.744828	12	0.882
13	Reduction in errors	0.751724	11	0.689
14	Reduces disputes	0.724138	14	0.728
15	Better Recording of Economic information	0.758621	9	0.726
16	Market Enlargement	0.717241	18	0.946
17	Increase in Reliability	0.758621	10	0.861
18	Help in Adoption of new technologies	0.786207	5	0.923
19	Reduce labor intense	0.77931	6	0.772

From table 7. it is identified that ‘Better Recording of documents’ is the most important benefit among other benefits factor to adoption of e-procurement in Construction industry having the Average index value of 0.806897 followed by ‘Faster procurement’ having Average index value of 0.8. Savings and increase in efficiency, Higher transparency, Help in Adoption of new technologies, are ranked as third, fourth and fifth most

important benefits. From the results it is also identified that all the benefits are important to adoption of e-procurement in Construction industry because the last benefit “Easier access to market” has Average index value of 0.696552 which indicates that all the benefits are important.

**RELIABILITY TEST**

The Cronbach’s alpha values calculated to check the reliability of the results obtained from the respondents. The collective alpha value is calculated for all the benefits in adoption of E-Procurement. The Cronbach’s alpha value of the collected data from respondents is 0.907 which are in between the acceptable range of 0.6 to 0.9 as shown in table below.

**Table 8:** Reliability test of benefits in adoption of E-Procurement.

Cronbach’s Alpha	No of Items
0.907	19

**VII. CONCLUSION**

The construction industry exists distinctive although overwhelmed with controversy, challenges, and inadequacy. These difficulties might lead to construction authorities being cautious of latest techniques as they have been slow to realize lessons from rest of the industries in the past. In latest periods the business world has been modernized with the constant application of Information Technology (IT). The construction industry has accomplished this, although later than other industries and is using it in daily operations.

An empirical analysis has been performed for benefits and barriers of e-procurement. The first aim of the research is to identify the benefits of e-procurement the top way for the industry to follow at their conversion time from traditional methods of obtaining to e-procurement adoption. This is attained by determining the driving ability of every potential benefit. The benefits of e-procurement systems. Better Recording of documents is noticed as the highly considerable benefit, after that Savings and increase in efficiency, Higher transparency, Help in Adoption of new technologies, reduce labor intense, reduce tender cycle time, awarding process will be very organized and precise, save costs, Better Recording of Economic information, Increase in Reliability, are determined as the top 10 benefits for adoption of e-procurement

The second and the extreme aim of the research is to identify the barriers of e-procurement. The findings of the first portion of the study signify that among the barriers of e-procurement Lack of Appropriate technology infrastructure, Lack of upper management support, Lack of E-Procurement knowledge, Lack of appropriate National policy on E-procurement, Lack of training program for E-Procurement, Weak IT Infrastructure of Organizations, Lack of knowledge regarding taxation related to E-commerce, Resistance to change, Lack of skilled person, Poor IT potential are the most important barrier in the adoption of e-procurement systems. Therefore, in undertaking the barriers of e-procurement systems, the administration of the industry would concentrate further on IT/technological foundation of the expertise and ability of human resources for adopting e- procurement. Defeating these barriers shall support to lessen the adverse consequences of all other barriers...

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