Factors Influencing Public Sector e-Procurement System in Bangladesh: From a Critical Literature Review to a Conceptual Framework

Md. Abdur Rashid[1] and Mohammad Shorif Uddin[2]

Corresponding Author: Md. Abdur Rashid
Received 06 November 2019; Accepted 21 November 2019

Abstract: E-Procurement system is web-based application software if implemented in public procurement might lead to efficiency, transparency, accountability and time and cost reduction. Current e-Procurement implementation in Bangladesh is at the early stage as it is started in 2011. This paper examines the different factors those are identified by experts, researchers, academicians and policy implementers for the improvement of e-Procurement system. In addition, it performs a literature review to propose a conceptual framework through summarizing the variables for making a hypothesis of the research study.

Keywords - Public sector e-Procurement, efficiency, transparency, accountability, hypothesis, conceptual framework.

I.   INTRODUCTION

The term Electronic Procurement (e-Procurement) is the use of web-based application platforms which are secure and managed by the government as a buyer to communicate with bidder's community in a paperless environment which is free from the bureaucracy, delays, and physical insecurities of any kind (www.eprocure.gov.bd),Sanewu, 2016).E-Procurement outcomes are commonly identified in the context of Bangladesh and other countries as follows (Marcella, 2006):Intermediate e-Procurement outcomes are (i) Better services, (ii) Cost savings, and, (iii) Time saving. Final outcomes are (i) Advancement of the labor productivity in the public sector, (ii) economic rationality (organizational efficiency), (iii) Process simplification, establishing transparency and accountability, and, (iv) Gross Domestic Product (GDP) magnification. E-Procurement implementation has incepted in Bangladesh since 2011 by the initiation of Central Procurement Technical Unit (CPTU) under the flagship of Ministry of Planning in Bangladesh. This paper highlights the importance of factors that affects public sector e-Procurement applications in Bangladesh. The importance of this paper is to make systematic literature review assessment that explores and presents the interrelationships among e-procurement through some variables. To some extent, these variables i. e, factors can be considered as drivers for improving e-procurement system.

II.   BACKGROUND

The inception of e-procurement gives a scope for reduction of purchasing costs, transaction costs and the price paid for goods and services (Saxena 2018). In a report titled e-Government Procurement (Rehana, 2017) shows that Canada started e-Government Procurement (e-GP) system in 1991. Successively, rest of the country introduced e-GP system shown in figure-1.
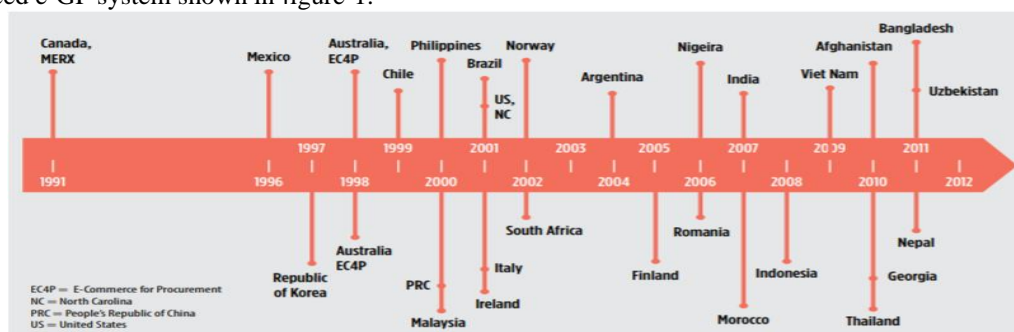

Figure 1: E-GP systems adoption worldwide

---
[1]PhD Fellow, Bangladesh University of Professional, Dhaka, Bangladesh.
[2] PhD Supervisor & Professor, Department of CSE, Jahangirnagar University, Dhaka, Bangladesh

In India, Government electronic Procurement National Informatics Centre (Ge-PNIC) system (Annual Report, 2017-18) covered around 75% of country's electronic procurement needs. This helps the government of India in a competitive advantage on saving procurement expenditures, mostly cost and time. In Nepal, this e-Procurement system has been introduced to improve the much-needed transparency, removing biasness and to ensure equal access of all in open competition of public procurements. In Malaysia, it removes red-tapes, enforces law compliance, and, also helps in enhancing e-Commerce. As a result, accountability and transparency were ushered in government contracts and projects. In Russia, the system of e-Procurement is reducing distance and information barriers in participation for the big nations. In European Union, e-Invoicing, e-Control payment and e-Evaluation process are some additions when comparing with Bangladesh e-Procurement system. In Portugal, e-Procurement helped to reduce corruption and to bring integrity. In Singapore, innovations in e-Procurement system saw that small- and medium-enterprise (SME) participation increases. In e-Procurement time saving, cost reduction and bidders list, value for money (purchase quality product by optimum price), transparency, fair and open competitions are the major attributes. From the strategy paper of Asian Development Bank (ADB 2004), it is observed that economic development can be included in e-GP objectives through participation of private sector. Private sector activation in e-GP system is a factor of GDP growth but still it is beyond consideration in Bangladesh e-GP system. Bangladesh faced many problems and difficulties in ensuring accountability, efficiency and transparency in public procuring system. To overcome these problems an e-GP system has been introduced from 2011. There are a lot of countries like India, Malaysia, Sri Lanka and some of the countries of European Union are using e-Procurement system to make the public and private-sector purchase transparent.

III. E-PROCUREMENT: A NEW PERSPECTIVE IN BANGLADESH

3.1 Guiding Principle (e-GP Guideline) in Designing Public Procurement Act (PPA), Public Procurement Rules (PPR) & e-GP System

This document (CPTU, 2011) imparts main guidelines for adopting e-GP system in Bangladesh. It has provisioned under section 65 of PPA 2006 and rule 128 of PPR 2008. The guidelines are prepared also in consistent with the prevailing ICT Act 2009, Right to Information (R2I) 2009 and international practices on electronic procurement. The E-GP guidelines ensured achievement of greater openness and accountability in public procurement system.

3.2 Public Procurement Reform Impact

A writing on 17th November 2018 at CPTU website (https://www.cptu.gov.bd/media-communication/news.html) was mentioned that e-GP interventions resulted in significance improvement of cost savings for both public procurement entities and e-GP bidders. It also enhanced efficiency, transparency, competition and better delivery of public services.

3.3 E-GP Vision

E-GP vision was made to magnify the efficiency and transparency in Bangladesh public procurement system (www.e-procure.gov.bd). Figure 2 shows the visions of e-GP system of Bangladesh.

Figure 2: Bangladesh e-GP Vision (www.e-procure.gov.bd)

3.4 e-GP Stakeholders

Figure 3 shows the list of stakeholders involved in the e-GP system through cloud-based connectivity. These 8 stakeholders are getting their access power through respective email id and password.
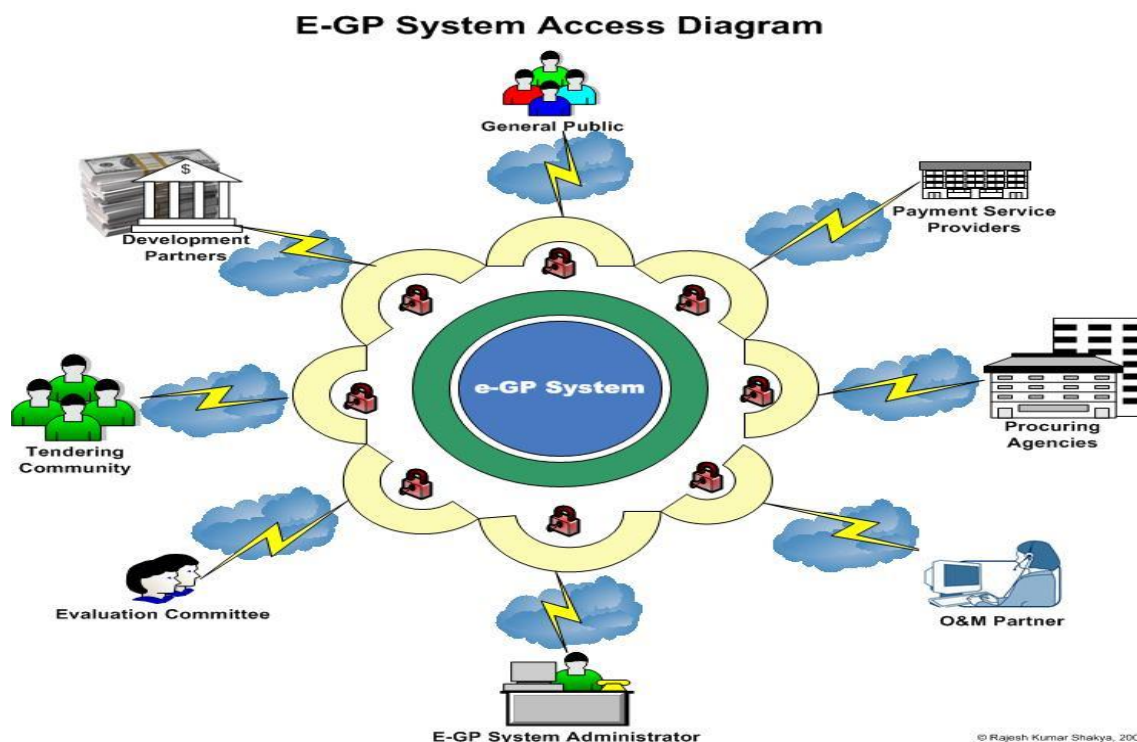
Figure 3: Bangladesh e-GP System Access Diagram (www.e-procure.gov.bd)

3.5 E-GP Modules
Bangladesh e-GP system consists of the following 9 interlinked modules (CPTU, 2011).
1. Central registration system for all stakeholders
2. Workflow Management System (WMS)
3. e-Tendering (e-Publishing/e-Advertisement, e-Lodgment, e-Evaluation, e-Contract)
4. e-Contract Management System (e-CMS)
5. e-Payments
6. Procurement Management Information System (PROMIS)
7. Security and System Administration
8. Handling Exceptions and Errors.
9. Usability and Help

3.6 E-GP Security Features
Strict security measures have been taken in the following layers of e-GP system as part of safety measures (Kevin, 2016): (i) Presentation layer,   (ii) Session layer, (iii) Transmission/Transaction layer, (iv) Application layer, (v) Database layer, (vi) Hardware layer.
3.7 Current e-GP Implementation Status in Bangladesh
Table 1 shows the e-GP implementation status in March 31, 2019 by the CPTU, IMED (www.e-procure.gov.bd).

Table 1: e-GP Registration Status in Bangladesh

Issues	Total
Registered Ministry, Division, Organization and PE offices	Number of Ministries- 47 Number of divisions – 27 Number of Organizations- 1215 Number of PE Offices- 5869
Bidder registered	National- 58141 International- 15
Debarred company	187
Annual procure plan approved	112154
Total contracts awarded	421222

3.8 E-Procurement Indicator in 7th 5YP

According to the 7th FYP(Five-Year Plan), 2015-2020 Bangladesh government wants to utilize e-GP as shown in Table 2 (Figures are in (%) of public institutions.)

Table 2: e-Procurement Indicator

Target Year	2014	2016	2017	2018	2019	2020
Percentages (%)	0	16	40	65	89	100

The above table reveals that by 2020, Government is bound to fulfill the target of 100% implementation of e-Procurement under the authority of CPTU, IMED division, Ministry of Planning.

IV.   Challenges in e-Procurement Implementation

In 2011, Government of Bangladesh started public procuring using e-procuring software (www.eprocre.gov.bd) through the innovative technology like e-GP system. The target of government is to purchase 100% public procurement using e-Procurement software. According to 7th FYP, 2015-2020, Government has targeted to achieve 100% public purchase using e-tender system by 2020.

Reviewing e-Procurement literature, we have not found any in-depth research in assessing e-GP system implementation after its inception. Still there are some hindrances those are affecting e-GP system implementation fruitfully. These are:

▪   Absent of selecting factors those are influencing to make effective e-Procurement implementation and assessment model.

▪   User thinks that e-procurement will be more complex and not user friendly

In Bangladesh context, the e-Procurement challenges are commonly identified as:

▪   For bidder
 I.   Absent of awareness program
II.   Less initiative to create trust in e-GP system
III.   Lack of internet knowledge
▪   Organizational perspective (Marcella 2006)
 I.   Not adequate initiative to change the habit of procurement entity (PE) users. So some resistances are there.
II.   Less initiation in organizational innovation

V.   CRITICAL OBSERVATION FROM LITERATURE SURVEY

5.1 Key Success Factors (KSFs) of e-Tendering

Success factors helps to put a firm in a position of competitive advantage in terms of performance. By discovering CSFs, an organization can establish known points to help in evaluating the performance of its business (Kevin, 2016) to achieve goals.

Sometimes KSF are also called as Critical Success Factor (CSF). Through literature review, we find a list of Critical Success Factor (CSF) that can be addressed as independent variable for the purpose of making conceptual framework of any research.   Table 3 shows some factors or variables that influence e-Procurement implementation.

Table 3: Study variables with sources

Factors/ Variables	Source/Reference	Model
▪ Efficiency ▪ Transparency ▪ Competition	(https://www.cptu.gov.bd/media-communication/news.html), (www.eprocure.gov.bd), (World Bank Report 2002), (www.eprocure.gov.bd)	
▪ Top management commitment ▪ Information technology infrastructure ▪ Staff training	(Mambo P, 2015)	
▪ Organizational attitude ▪ Competitive pressure ▪ Government policies and regulations	(KASAINE, 2014)	
▪ Saving procurement expenditures, mainly cost and time	(Ge-PNIC system Annual Report 2017-18)	

Factors/ Variables	Source/Reference	Model
▪ Increase transparency, non-discrimination, equality of access, and open competition ▪ Improve quality government tendering process ▪ Eliminated barriers of the traditional procurement procedures. ▪ Removed red-tapes ▪ Improves accountability and ensured transparency ▪ Suppliers receive faster and more accurate payment ▪ Enhance collaboration between business sector and government		
Value for money ▪ quality goods, works and services	(mapsinitiative.org 2018)	
Transparency ▪ disclosure to make policies ▪ legal and institutional frameworks ▪ Information available to the public in a comprehensible, accessible and timely manner	(mapsinitiative.org 2018)	
Fairness ▪ public procurement process will free from bias, ensure equal treatment, decision and integrity	(mapsinitiative.org 2018)	
Good governance ▪ Way of public procurement and reforms	(mapsinitiative.org 2018)	
CPTU competency ▪ System and security administration ▪ Handling errors and exceptions ▪ Application usability and help ▪ Preparedness and readiness of bidding communities (Infrastructure &HR) ▪ Negative attitude of PE communities in the transformation of e-Procurement implementation ▪ Use of digital signature ▪ Debarred company list ▪ Encryption of submitted bids ▪ Supplier directory	(www.cptu.gov.bd)	
▪ Reduce distance and information barriers ▪ Entry of foreign firms into the domestic procurement marketplace ▪ Boosting competition	(Rehana,2017)	
▪ e-Invoicing ▪ Improved access, transparency, integrity and quality of procurement data ▪ e-Auction	(Becker,2018)	
▪ Total e-Tender floated in the starting year vs total e-Tender floated in the current year	(https://opentender.eu/pt/)(Becker,2018)	
▪ Transparency ▪ Fair and open competition ▪ Value for money ▪ Saving time ▪ Need not pay administrative charges taka for a copy of tender specifications	(Civil Service College Singapore 2010), (www.mof.gov.sg)	
e-GP Objectives ▪ Governance ▪ Transparency ▪ Accountability	(ADB, 2004)	
e-GP Objectives ▪ Effectiveness ▪ Efficiency ▪ Value for money	(ADB, 2004)	

Factors/ Variables	Source/Reference	Model
e-GP Objectives ▪ Economic development ▪ Business development ▪ Competitiveness	(ADB, 2004)	
Pillar I. Legal, Regulatory and Policy Framework ▪ Adequacy of the structure of the legal framework ▪ Legal framework applies to all procurement undertaken using public funds (goods, works and services) ▪ Current laws, regulations and policies are published and easily accessible to the public at no cost	(mapsinitiative.org Report, 2018)	MAPS
Pillar II. Institutional Framework and Management Capacity	(mapsinitiative.org Report, 2018)	MAPS
Pillar III. Public Procurement Operations and Market Practices	(mapsinitiative.org Report, 2018)	MAPS
Pillar IV. Accountability, Integrity and Transparency of the Public Procurement System	(mapsinitiative.org Report, 2018)	MAPS
Lacking's ▪ Absence of sound legal framework for governing public sector procurement ▪ Complex bureaucratic procedure causing delay ▪ Lack of planning ▪ Multiple layers in the approval and review process ▪ Absence of sufficient professional competency of staffs ▪ Generally poor-quality bidding documents and bid evaluation ▪ Lack of appropriate process for ensuring transparency and accountability.	(World Bank Report, 2002)	
▪ Efficiency, Effectiveness, Competitiveness, Dematerialization and Transparency	(Gardenal, 2013)	Gardenal
▪ Process Improvement of e-Procurement	(Akando Zaiful Islam, 2016)	Akando

VI. CONCEPTUAL FRAMEWORK

Table 4 is a summary of the contents of table 3 by dividing the variables into dependent and independent variables to make a clear conceptual framework of the literature review.

Table 4: Proposed conceptual framework for assessment

Dependent Variable	Independent Variable
Efficiency	1. e-Payment (registration money, tender schedule money, earnest money, security money) 2. Expenditure/ Cost 3. Time 4. e-invoice Procedure
Transparency	1. Non-discrimination 2. Equality of Access 3. Secrecy of bidders information 4. Elimination of undue pressure 5. Reduction of collision among the bidders 6. Boosting completion 7. Discloser to make policies 8. Online tender notice availability
Boosting Competition	1. Fair and open competition 2. Access to information for all 3. Clear criteria for bidder qualification 4. Distance barrier
Accountability	1. Collaboration increased between PE and bidders 2. Behavioral Change 3. Value for Money
Public Procurement Governance (PPG)	1. Capacity development 2. Integrating Principles 3. Procurement Planning Publish 4. Quality of government tendering process 5. Red-tapism 6. Problem encountered after contracts awarding and during goods, works and service delivery at PE premises.
Dematerialization	1. Paperless procurement process 2. Reduced Archiving cost
Legal, Regulatory and Policy Framework	1. Overall CPTU performance 2. PPA 2006 (and subsequent amendments) 3. PPR 2008 (and subsequent amendments) 4. e-GP Guideline 2011 5. Adopted of digital signature
Process Improvement	1. Workflow management 2. Managing capacity of large number of bidders 3. Automatic generation of necessary report 4. e-Contract Management System

From table, 4we have developed key conceptual framework model and is shown in Figure 4. This model is hybridization of the Maps initiative, Francesco Gardenal's e-Procurement impact model and from the summary of the literature review.
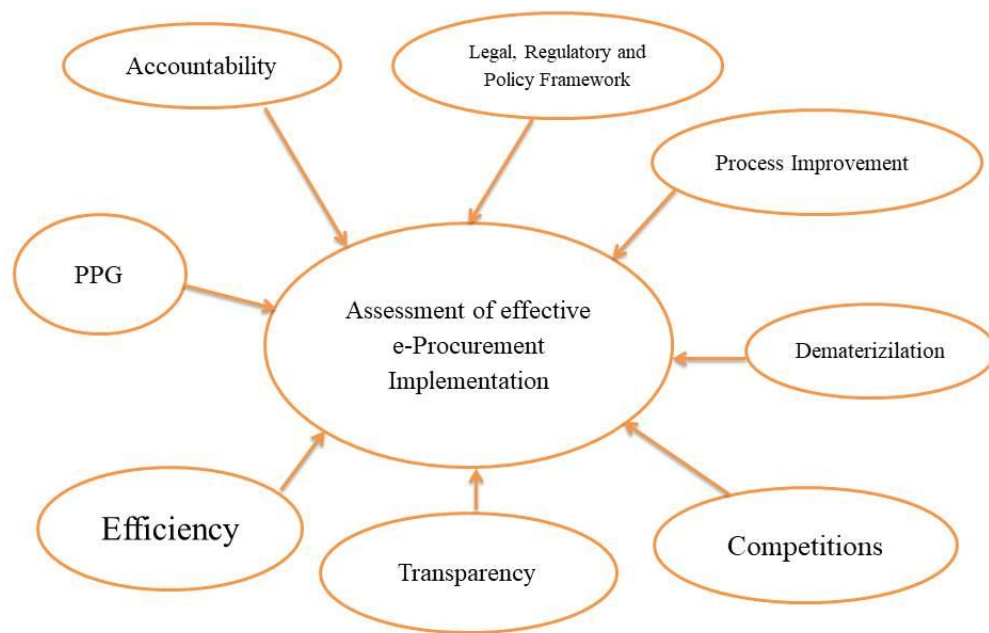
Figure 4: Proposed framework model of e-Procurement implementation assessment system

VII.   CONCLUSION

An assessment of literature review on e-Procurement implementation scenario has been completed and an effective conceptual framework has been developed for future use in e-Procurement implementation assessment. Predicted significant effects of different factors that are influenced e-Procurement implementation in Bangladesh. Academicians, students, researchers, bidding communities and also policy makers will acquire knowledge for further research and policy up-gradation. Using the proposed conceptual framework, SDG Goal 12, which calls promotion of sustainable procurement practices in line with the national priorities and policies and SDG Goal 16, which calls effective and accountable institutions can be achieved.

REFERENCES

[1].   ADB, IADB and WB (2004). *Strategic Electronic Government Procurement - Strategic Overview: An Introduction for Executives*. World Bank. Report no- 88252. Copyright -March 2004.Washington, DC.
[2].   Akando Zaiful Islam (2016). Challenges and Prospects of e-Procurement in Bangladesh: A Study on Roads and Highways Department. Available at: https://bit.ly/2lBk9Rv [Accessed 1 March 2019]
[3].   Becker Jörg (2018). *Systems and e-Procurement - Improving Access and Transparency of Public Procurement*. European Parliament, Policy Department A: Economic and Scientific Policy, PE 618.990
[4].   Civil Service College (2010). *Value for Money in Singapore's Government Procurement Regime*. April 26 – 29. Marmora hotel, Taksim square, Istanbul, Turkey. Sixth regional public procurement forum, Pages 2-10.
[5].   CPTU (2011). *Bangladesh Electronic Government Procurement (e-GP) Guideline*. Dhaka. CPTU, IMED, Ministry of Planning, Bangladesh Gadget, Registered no- DA-1. Proggapon on 1st February 2011.
[6].   Gardenal Francesco (2013). A model to measure e-Procurement impacts on organizational performance. *Journal of Public Procurement*, 13(2):215-242, DOI: 10.1108/JOPP-13-02-2013-B003.
[7].   Ge-PNIC (2017-18), Annual Report On Central Public Procurement Portal. Procurement Policy Division, Ministry of Finance, India.
[8].   Kasaine Carolyne masiyioi (2014). Factors influencing implementation of e-procurement in supermarkets in nairobi, kenya.[Online] Available at: https://bit.ly/2lKTy4n [Accessed 30 August 2019]
[9].   Kevin George Obat (2016). Critical success factors in the implementation of e-Procurement in public entities in Kisumu County, Kenya. [Online] Available at: https://bit.ly/2lDav0Q [Accessed 20 May 2019]

[10]. Mambo P, Ombui K, Kagiri A (2015). Factors Influencing Implementation of E-Procurement in The National Government: A Case of The Ministry Of Interior And Co-Ordination of National Government. *The Strategic Journal of Business and Change Management.* Vol. 2 (46), pp 951-999.

[11]. mapsinitiative.org, (2018). Methodology for Assessing Procurement Systems 2018. (Online) Available at:http://www.mapsinitiative.org/methodology/MAPS-methodology-for-assessing-procurement-systems.pdf [Accessed 15 Feb 2019]

[12]. Marcella Corsi (2006). E-Procurement overview. Marcella Corsi Università. "La Sapienza". di Roma. January 2006, Pages 1-9.

[13]. National e-Government Procurement (e-GP) Portal of the Government of the People's Republic of Bangladesh (www.e-procure.gov.bd), Last visited on 14th Sep 2018.

[14]. Rehana Mohammed (2017). *E-Government Procurement: Enabling Business through Efficient Systems*. Verité Research Pvt Ltd. January 2017, Pages 1-34. Police Park Palace, Colombo, Sri Lanka

[15]. Sanewu Esther Nasidai (2016). Factors influencing implementation of e- procurement: a case study of small and medium size businesses in Voi Town. *European Journal of Logistics, Purchasing and Supply Chain Management*. Vol.4, Issue 6, pp.11-20.

[16]. Seventh Five Year Plan, FY2016-FY2020, GED, Planning Commission, Bangladesh. December 2015.

[17]. World Bank Report (2002). *Bangladesh Country Procurement Assessment Report*. World Bank. *Report No. 24144-BD.* May 11. Washington DC.