

A Study on Impact of Electronics Government Procurement on Procurement Effectiveness of the Building Construction Works at Jumla

Birendra Bahadur Budthapa^{1,*}, Uttam Neupane², Subash Kumar Bhattarai³, Socrates Bhattarai Sharma³

^{1,3} Central Department of Civil Engineering, Mid-West University, Surkhet, Nepal- Research Scholar, erbudthapa@gmail.com (B.B. Budthapa), socrates.0021@mugser.edu.np,

² Assistant Professor, Central Department of Civil Engineering, Mid-West University, Surkhet, Nepal. uttam.neupane@mu.edu.np

³ Visiting Faculty, Central Department of Civil Engineering, Mid-West University, Surkhet, Nepal. subashkbhattarai@gmail.com

Abstract

E-procurement is the modern way of using electronic tools, such as the Internet and e-mail for business-to-business purchases online. Besides, it also helps to supply and provide services for sales online using Internet-based technology and can be a tool used by all governments to promote more extensive reforms in the areas of advancing the social, technological, and economic infrastructure. Procurement of construction works, goods and services electronically in addition will increase transparency and accountability, improve standardization and healthy competition, reducing usage of paper and hard copy documentation as well as improving the efficiency, effectiveness of the procurement process. E-Procurement implementation at the building construction work at Jumla district level in some impact i.e., processing time reduce; accessibility increase was bothered by low as compared with cost saving and increasing transparency but all included impact on structural questionnaire is reliable (Reliable test value = 0.987) on procurement of building construction work.

Methods of data analysis used in this research are by using a software program SPSS (Statistical Package for the Social Sciences) to examine the relationship between variables. RII (Relative Importance Index) ranked introduced impact of e-GP on procurement efficiency. The population used in this study are clients, consultants and contractors who are directly involved in procurement of building construction work of Jumla district.

Finally, Nepalese construction industry should focus on adopting electronic procurement on all construction work by facilitating IT & ICT infrastructure to more significantly enhanced the procurement effectiveness construction industry.

Keywords: *Building construction work, e-procurement, IT & ICT infrastructure, Public*

1. Introduction

Computerized procurement of products and services will enhance accountability and transparency, expand market access, foster healthy competition, and boost procurement process effectiveness, of course it will also indirectly support the process of monitoring and auditing, and meet the needs of information access real-time order realizing clean and good government in the procurement of government goods and services [1].

Government organizations across the country can electronically order goods, works and services from their suppliers thanks to the e-procurement system. E-procurement replaces the traditional procurement procedure with electronic, Internet-based procurement. In turn, suppliers gain by being able to advertise their goods on the Internet; suppliers can use the e-procurement system to receive, handle, and process government purchase orders as well as to get paid by government organizations online. Suppliers gain a lot from the chance to connect with a larger audience of buyers than ever before, as well as from the opportunity to reduce operating costs, speed up turnaround, generate more revenue, and improve customer satisfaction, thanks to the automation of the entire procurement cycle within an e-procurement framework [2], [3]. The advantages of implementing e-procurement for public procurement are a well-researched topic. By boosting operational efficiency, transparency, competitiveness among bidders, and organizational effectiveness through automation of manual processes, the implementation of e-procurement leads in cost savings to the exchequer. Engineering procurement processes, change management, and top management support are among the key success criteria for implementing e-procurement projects, according to a study of recent research literature [4].

By implementing e-government, developing nations are attempting to adopt industrialized nations' techniques to match their achievements in terms of the efficacy and efficiency of public administration. However, a lot of e-government programs in developing nations unfortunately fail. These failures have shown that e-government techniques need to be modified for various cultural contexts, but doing so is challenging given that much e-government research has concentrated on wealthy countries.

By using Indonesia's successful e-Government Procurement (e-Procurement) as a case study, this research seeks to close a gap in the literature on e-Government in developing nations. The research will make significant contributions to two areas. First, it will concentrate on the organizational adoption of an existing e-Procurement solution by a public agency, as supported by a central government agency, rather than individual adoption. Second, it will concentrate on issues in developing nations, particularly how corruption may affect the implementation of e-Procurement. According to recent literature, research on the adoption of technology has largely used the quantitative research approach [5].

The massive expenditure on public procurement, particularly capital expenditures, make it extremely corruptible. With different levels of success, many governments throughout the world, including Indonesia, have embraced e-procurement to boost accountability, cut down on corruption, and raise transparency. E-Procurement was adopted by the government of Indonesia in 2008, and by the Indian government in 2012. Even though those two developing nations have been using e-procurement for a while, there has only been a small amount of research on its effectiveness in lowering procurement corruption. The research attempts to evaluate the deployment of e-procurement's impact on procurement corruption cases in India and Indonesia by combining quantitative and qualitative methodologies. According to the data, corruption is more likely to occur in Indonesian provinces with high capital expenditure ratios, and implementing e-Procurement had an impact on lowering the incidence of procurement corruption in these areas. While this was happening, E-Procurement state-level implementation in India was somewhat hampered by low competency and professionalization staff as well as large-scale political intervention in state administrations. As a result, E-Procurement was not effective enough to reduce a notably large number of procurement corruption at the state governments [1].

1.1 Objective of the study

This study's main goal is to investigate the effects & status of electronics-government procurement on identifying procurement effectiveness of the building construction works at Jumla district. To achieve this, the following specific objective has been pursued.

- To explore the impact of electronics-Government Procurement (e-GP) on procurement effectiveness of building construction works at Jumla district.

1.2 Limitations of the study

The limitations of the study are given below:

- The study's research population includes the public entities manager, director, procurement officer, technical person, contractors who directly & indirectly related to the building construction work at Jumla district.
- Due to time & resources constraints, the study is limited building construction procurement work at Jumla district of Nepal.
- The primary discussion in groups cannot be conducted at Jumla district among the procurement related groups.

2. Literature Review

E-governance is the utilization of technology to run governmental operations online and give individuals simple access to governmental services. It is a socio-technical system that depends on individuals, groups, organizations, processes, and resources. Although it is defined differently by different writers, the fundamental goal is to create functional work systems and enhance activities by utilizing contemporary technologies. Information and communication technology usage in government operations and procedures to achieve "simple, moral,

accountable, responsive, and transparent" (SMART) governance is known as "e-governance" or "electronic governance" on the work of government and public sector organizations. Various academics have carried out several studies on e-governance that relate to effectiveness, safety, dependability, connectivity, and other related factors over time. [6].

Asian Development Bank supported and provided funding for the project while introducing E-government in Nepal. In November 2006, the e-Government Master Plan (e-GMP) consultative report was made public as part of a collaborative initiative that included the High-Level Commission for Information Technology (HLCIT), National Information and Technology Center (NITC), Ministry of Environment Science and Technology (MoEST), Ministry of Industry and Commerce (MoIC), Ministry of General Administration (MoGA), and Minister of Industry, Commerce, and Tourism. Korea IT Industry Promotion Agency (KIPA) carried out e-GMP, which prepared the basis for e-government transformation. In order to enhance the capability of E-governance, government of Nepal revised and brought new policies and regulations in practice to further strengthen the E-governance implementations in Nepal [6].

According to [7], Public procurement describes the procedures that are employed by public or government entities to acquire goods, works, and other services from outside sources [8]. Inaccurate planning for procurement, a lack of monitoring and controlling systems, a lack of openness and accountability, and low levels of professionalism in the bureaucracy, however, make public procurement procedures especially susceptible to corruption [7]. However, employing an e-Procurement system alone does not ensure that public procurement operations would improve [1].

E-procurement is the modern way of using electronic tools, such as the Internet and e-mail for business-to-business purchases online. Besides, it also helps to supply and provide services for sales online using Internet-based technology. The application of the internet and IT to transact business with suppliers and customers is a further example. E-Procurement as the practice of Internet-based Information and Communication Technologies (ICT) to carry out one or more transactional or strategic procurement activities. E-procurement has gained popularity among companies, industries, and governments as a strong instrument to increase productivity and efficiency as well as the standard of services provided to those who use it [2] [9].

Better supplier coordination, faster transaction times, and more process coordination are all provided by the EGP. By receiving electronic orders in the form of online purchase orders, this technique improved order accuracy. The government agency's running expenses will fall as a result. Government savings through public procurement will be significant and will indirectly affect the country's GDP. Electronic government service, especially in the public sector, improves domestic trade barriers and increases productivity in the country. It also creates jobs, offers taxpayers and government agencies the best value for their money, and drives the economy by reducing reliance on foreign sources of supply [10]. Companies and government bodies are prone to set up some sort of online acquisition with the benefit sought for a wider range of suppliers for pricing comparison [11]. According to [9] an essential draw for EGP adoption is the consumers' perception of a barrier and advantage. Given the numerous instances of potential fraud, corruption, bid-rigging, and supplier collusion that are often revealed in the media, the need to embrace e-Procurement for public procurements becomes urgent. Additionally, several undercover investigations have revealed that politicians and bureaucrats have the power to sway contracts to their benefit [12].

E-governance implementation is dependent on organizational, technical, social, and financial factors which act as opportunities as well as challenges/ barrier for it. The researcher identifies eleven significant barriers/challenges while implementing the e-government in Nepal. They are inadequate IT infrastructures, lack of awareness for e-government services, lack of privacy and security, lack of confidence / confidence in using e-government services, a lack of policy and a weak legal system, a lack of qualified personnel, budgets and operating costs, a lack of a clear strategic vision, a lack of partnerships between the public-private sectors and a lack of transfer and alteration [6]

3. Research Methodology

To ascertain the effects of electronics government procurement on procurement efficiency and operational effectiveness, a comprehension research methodology was employed. The study utilized structured questionnaire survey as a quantitative approach of research.

3.1 Target Population & Sample Size

The research area is the Jumla district of Karnali Province. The target groups for this study were clients, consultants, and construction contractors. The respondents were project managers, procurement officer, technical engineer, site engineer working on clients, consulting, and construction firms as they had a practical experience in procurement & construction field. Their sufficient experience is a suitable indication to find out the perception of the relative importance of impacting factors in procurement of construction work, goods and services. The sample size was determined through statistical methods.

Sample size, “n” for infinite population is calculated as follow,

$$n = \frac{Z^2 * p * (1-p)}{m^2} \quad (\text{equation 1})$$

Where:

n = Sample size for infinite population

p = Percentage/proportion ricking a choice (Taken as 0.5)

m = Marginal of error (M.E.) = 5 % = 0.05 (generally taken 0.05)

Z = z-score (The number of standard Deviation)/A given proportion is any from the mean.

For the confidential level 95 %, Z taken as 1.645

Now for finite population taken = 38

$$\text{Sample size required} = \frac{ss}{1 + \frac{ss-1}{pop}} \quad (\text{equation 2})$$

Table 1: Sample Size Calculation

S.N.	Parameters	Projects / Respondents
1	Population Size (N)	38
2	Degree of Confidence (Z)	95%
3	Population Proportion (p)	0.5
4	Marginal of Error (m)	5%
5	Sample Size Calculation	33.429
6	Required Sample Size	34

The software tools for the analysis were Microsoft Excel and SPSS. The data were analyzed to find frequency distributions, means, standard deviation and RII.

3.2 Research Matrix

Table 2: Research Matrix

Research objectives	Data collection method	Data source	Expected outcome
To explore the impact of electronic government procurement on procurement effectiveness of the organization of building construction works at Jumla district.	Questionnaire survey	Primary data collection	Increased cost savings, competitive bidder, performance of contractor, accountability, transparency & improved overall operational efficiency.

4. Results and discussions

4.1 General Characteristics of Respondents

The majority were male respondents which was 88.2% and the remaining 11.8% were female respondents which shows the participation of both male and female in the research.

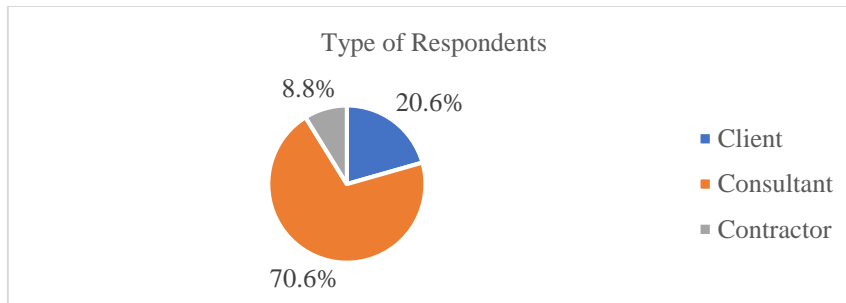


Figure 1: Type of Respondents

Figure 1 shows that the majority were respondents were consultants, which was 70.6%, client 20.6% and the remaining 8.8% respondents were contractors which shows the participation of all type of respondents in the survey.

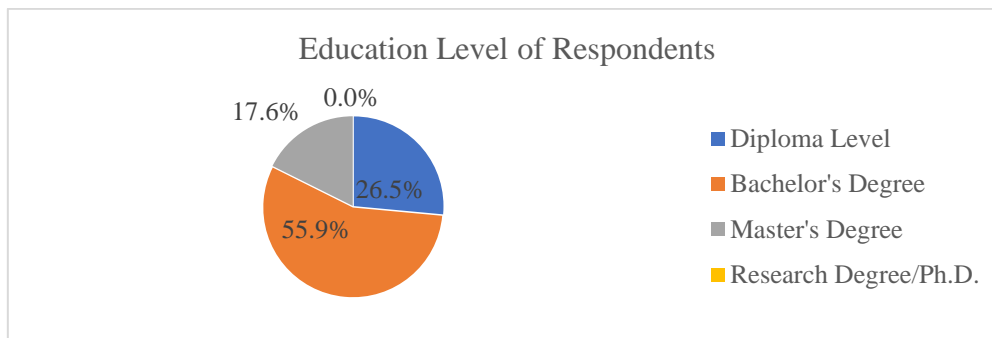


Figure 2: Education Level of Respondents

Figure 2 shows that the majority of those who participated were bachelor's degree holders, which was 55.9%. Similarly diploma level respondents were 26.5% and the remaining 17.6% of respondents were master's degree holders. None of the respondents have research degrees/Ph.D.

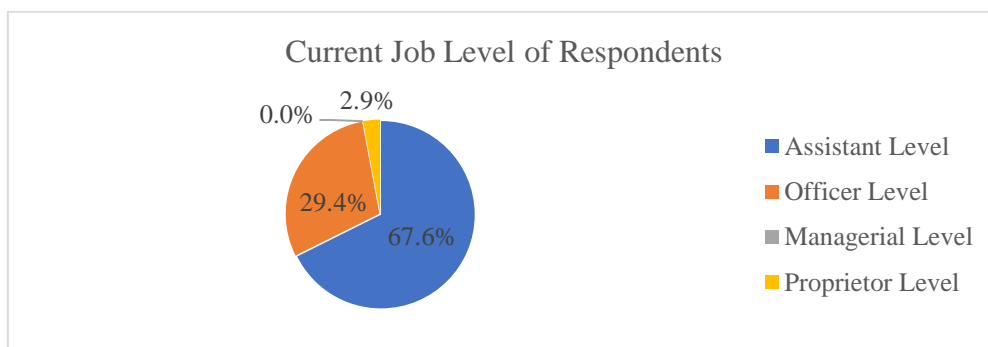


Figure 3: Current Job Level of Respondents

Figure 3 shows that the majority of those who participated were assistant level, which was 67.6%, 29.4% of respondents were found to be officer level, 2.9% of respondents were found to be proprietor level and no respondents were found to be managerial level.

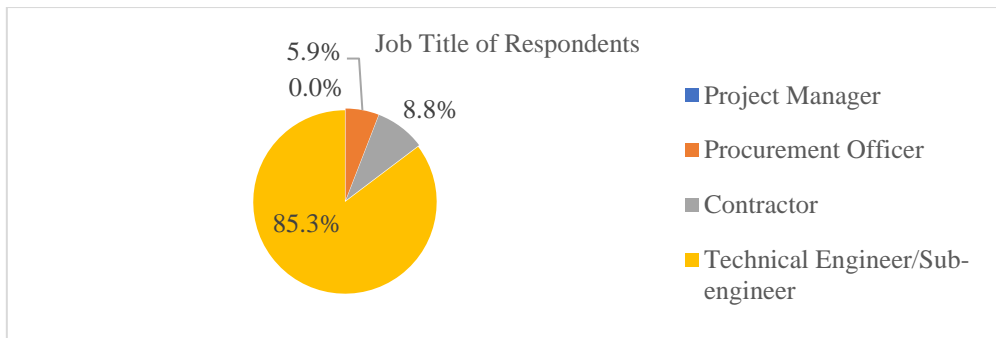


Figure 4: Job Title of Respondents

Figure 4 shows that the majority of those who participated were technical engineer/sub-engineer, which was 85.3%, 8.8% of respondents were found to be contractor, 5.9% of respondents were found to be procurement officer and none of the respondents were found to be project manager.

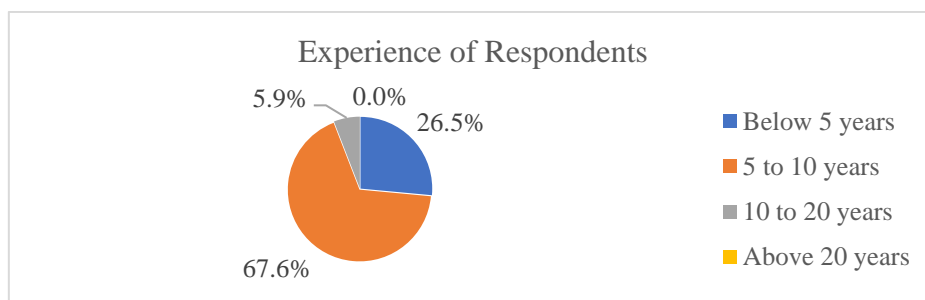


Figure 5: Experience of Respondents

Figure 5 shows that the majority of those who participated had experience of 5 to 10 years which was 67.6%, 26.5% of respondents were found to have experience below 5 years, remaining 5.9% of respondents were found to have 10 to 20 years of experience.

4.2 Reliability of Data

Questionnaire surveys were used to acquire 34 sets of data to explore the impact of electronics government procurement on operational effectiveness, procurement efficiency of the organization of building construction works at Jumla district. Since Cronbach’s Alpha 0.987 is greater than 0.7, this indicates higher internal consistency and higher reliability.

Table 3: Reliability Test

Reliability Statistics	
Cronbach's Alpha	No. of Items
.987	39

Objective: To explore the impact of e-GP on procurement effectiveness of building construction works at Jumla district.

The data collection process involved the use of Google Forms for questionnaire surveys. Subsequently, the collected data underwent analysis using SPSS and MS-Excel programs. Statistical parameters including frequency, percentage, and RII value were computed for each variable to assess the impact of E-GP on procurement of building construction work. The findings were presented in tables and graphs as deemed suitable.

Table 4: Ranking Reduced Processing Time Factor

S.N.	Statement	Client		Consultant		Contractor	
		RII	Rank	RII	Rank	RII	Rank
1	I strongly agree that the E-GP system has expedited the tendering and bidding phase for building construction works.	0.771	1	0.758	2	0.867	2
2	The E-GP system has reduced the administrative burden and paperwork, contributing to a shorter procurement cycle for building construction projects.	0.771	1	0.742	3	0.600	6
3	The E-GP system has enabled quicker approval and authorization processes, leading to reduced procurement cycle time for building construction projects.	0.714	3	0.775	1	0.733	4
4	I agree that the E-GP system has facilitated faster communication and response times during procurement activities for building construction works.	0.686	4	0.733	4	0.933	1
5	Had there been any notable time reductions in bureaucratic delays during procurement since the E-GP system's introduction.	0.743	2	0.642	7	0.733	4
6	The E-GP system reduced time to better coordination among stakeholders involved in building construction procurement.	0.714	3	0.692	6	0.800	3
7	The E-GP system's features and functionalities for building construction procurement take less time.	0.714	3	0.700	5	0.667	5

Table 5: Ranking Increased Transparency Factor

S.N.	Statement	Client		Consultant		Contractor	
		RII	Rank	RII	Rank	RII	Rank
1	The E-GP system provides clear & accessible information about tender opportunities for building construction works.	0.829	1	0.783	2	0.667	4
2	I feel that the E-GP system has increased fairness in the selection of suppliers and contractors for building construction projects.	0.800	2	0.783	2	0.933	1
3	I agree that the E-GP system has reduced the chances of favoritism and bias in procurement decisions for building construction projects.	0.800	2	0.800	1	0.867	2
4	I believe that the E-GP system has improved the visibility of the procurement process for building construction projects to stakeholders.	0.800	2	0.758	4	0.933	1
5	The E-GP system has streamlined the evaluation and awarding of contracts for building construction works, promoting transparency.	0.829	1	0.775	3	0.867	2
6	The E-GP system facilitates better documentation and disclosure of procurement activities related to building construction works.	0.686	3	0.758	4	0.800	3

Table 6: Ranking Enhanced Competition Factor

S.N.	Statement	Client		Consultant		Contractor	
		RII	Rank	RII	Rank	RII	Rank
1	The E-GP system has made it easier for new and smaller contractors to participate in bidding for building construction works.	0.771	2	0.775	1	0.733	3
2	I believe that the E-GP system has reduced barriers to entry, promoting competition in the building construction procurement market.	0.743	1	0.725	3	0.867	1
3	The E-GP system has improved the visibility of upcoming procurement opportunities, attracting more contractors to bid for building construction projects.	0.771	2	0.758	2	0.800	2
4	The E-GP system has provided equal access to information and resources, levelling the playing field for all bidders in building construction works.	0.771	2	0.725	3	0.800	2

Table 7: Ranking Cost Saving Factor

S.N.	Statement	Client		Consultant		Contractor	
		RII	Rank	RII	Rank	RII	Rank
1	I strongly agree that the E-GP system has reduced unnecessary expenses during procurement processes for building construction works.	0.857	1	0.800	1	0.733	3
2	The E-GP system has improved budget planning and allocation for building construction projects, resulting in cost-effectiveness.	0.857	1	0.733	4	0.800	2
3	I believe that the E-GP system has contributed to better negotiation and pricing, facilitated monitoring & control with contractors for building construction works.	0.829	2	0.750	3	0.933	1
4	The E-GP system has enabled more efficient resource utilization, leading to cost savings in building construction procurements.	0.771	3	0.733	4	0.800	2
5	I agree that the E-GP system has reduced procurement related delays & associated visible expenditure costs for building construction works.	0.743	4	0.758	2	0.733	3
6	The E-GP system has incentivized contractors to submit more competitive bids, resulting in cost reduction for building construction projects.	0.771	3	0.758	2	0.933	1

Table 8: Ranking Real Time Monitoring & Reporting Factor

S.N.	Statement	Client		Consultant		Contractor	
		RII	Rank	RII	Rank	RII	Rank
1	The E-GP system has enabled timely identification of bottlenecks and issues in the procurement process for building construction works.	0.771	4	0.750	1	0.733	2

2	I believe that the E-GP system has enhanced decision-making by providing up-to-date information on procurement status for building construction projects.	0.857	1	0.733	3	0.733	2
3	The E-GP system has facilitated quick reporting and communication of procurement updates to relevant stakeholders for building construction works.	0.829	2	0.742	2	0.933	1
4	The E-GP system has enabled better coordination among different departments involved in procurement for building construction projects.	0.800	3	0.725	4	0.933	1

Table 9: Ranking Reduced Paper Usage Factor

S.N.	Statement	Client		Consultant		Contractor	
		RII	Rank	RII	Rank	RII	Rank
1	I believe that the E-GP system has reduced the administrative burden related to handling and storing paper documents for building construction projects.	0.743	3	0.808	1	0.867	2
2	The E-GP system has made it easier to access and retrieve procurement records without the need for physical files in building construction works.	0.800	1	0.775	2	0.867	2
3	The E-GP system has facilitated better collaboration among stakeholders through digital sharing and storage of procurement documents for building construction works.	0.771	2	0.750	3	0.933	1

Table 10: Ranking Standardization & Compliance Factor

S.N.	Statement	Client		Consultant		Contractor	
		RII	Rank	RII	Rank	RII	Rank
1	The E-GP system has provided clear guidelines and templates to ensure consistent procurement practices in building construction procurements.	0.829	1	0.725	2	0.800	2
2	I agree that the E-GP system has reduced the risk of non-compliance and deviations from standardized procurement practices in building construction procurements.	0.686	3	0.717	3	0.733	3
3	The E-GP system has enabled effective auditing and reporting of procurement activities to ensure adherence to standards for building construction projects.	0.771	2	0.733	1	0.867	1
4	I strongly believe that the E-GP system has encouraged suppliers and contractors to comply with ethical and legal requirements in building construction procurements.	0.771	2	0.717	3	0.800	2

Table 11: Ranking Accessibility and Inclusivity Factor

S.N.	STATEMENT	CLIENT		CONSULTANT		CONTRACTOR	
		RII	Rank	RII	Rank	RII	Rank
1	The E-GP system has provided user-friendly interfaces and multilingual support to ensure inclusivity in procurement activities for building construction projects.	0.771	3	0.700	3	0.800	1
2	I believe that the E-GP system has increased the engagement of local businesses and suppliers, fostering inclusivity in building construction procurements.	0.657	5	0.708	2	0.800	1
3	I agree that the E-GP system has reduced barriers and increased opportunities for women-owned and minority-owned businesses to participate in building construction procurements.	0.829	1	0.767	1	0.800	1
4	The E-GP system has facilitated remote access to procurement information and documentation, promoting inclusivity for stakeholders located in remote areas building construction works.	0.714	4	0.700	3	0.800	1
5	The E-GP system has provided training and support to ensure that all stakeholders can effectively use the system, enhancing inclusivity in building construction procurements.	0.800	2	0.667	4	0.800	1

4.3 Summary of Findings

View of Clients, Consultants and Contractors from Table 4 to Table 11:

Reduced Processing Time Factor:

Rank 1: The e-GP system has expedited the tendering and bidding phase for building construction works.

Rank 2: The e-GP system has enabled quicker approval and authorization processes, leading to reduced procurement cycle time for building construction projects.

Increased Transparency Factor:

Rank 1: The e-GP system provides clear & accessible information about tender opportunities for building construction works.

Rank 2: The e-GP system has reduced the chances of favoritism and bias in procurement decisions for building construction projects.

Enhanced Competition Factor:

Rank 1: The e-GP system has made it easier for new and smaller contractors to participate in bidding for building construction works.

Rank 2: The e-GP system has reduced barriers to entry, promoting competition in the building construction procurement market.

Cost Saving Factor:

Rank 1: The e-GP system has reduced unnecessary expenses during procurement processes for building construction works.

Rank 2: The e-GP system has contributed to better negotiation and pricing, facilitated monitoring & control with contractors for building construction works.

Real Time Monitoring & Reporting Factor:

Rank 1: The e-GP system has facilitated quick reporting and communication of procurement updates to relevant stakeholders for building construction works.

Rank 2: The e-GP system has enhanced decision-making by providing up-to-date information on procurement status for building construction projects.

Reduced Paper Usage Factor:

Rank 1: The e-GP system has made it easier to access and retrieve procurement records without the need for physical files in building construction works.

Rank 2: The e-GP system has reduced the administrative burden related to handling and storing paper documents for building construction projects.

Standardization & Compliance Factor:

Rank 1: The e-GP system has enabled effective auditing and reporting of procurement activities to ensure adherence to standards for building construction projects.

Rank 2: The e-GP system has provided clear guidelines and templates to ensure consistent procurement practices in building construction procurements.

Accessibility and Inclusivity Factor:

Rank 1: The e-GP system has reduced barriers and increased opportunities for women-owned and minority-owned businesses to participate in building construction procurements.

Rank 2: The e-GP system has provided user-friendly interfaces and multilingual support to ensure inclusivity in procurement activities for building construction projects.

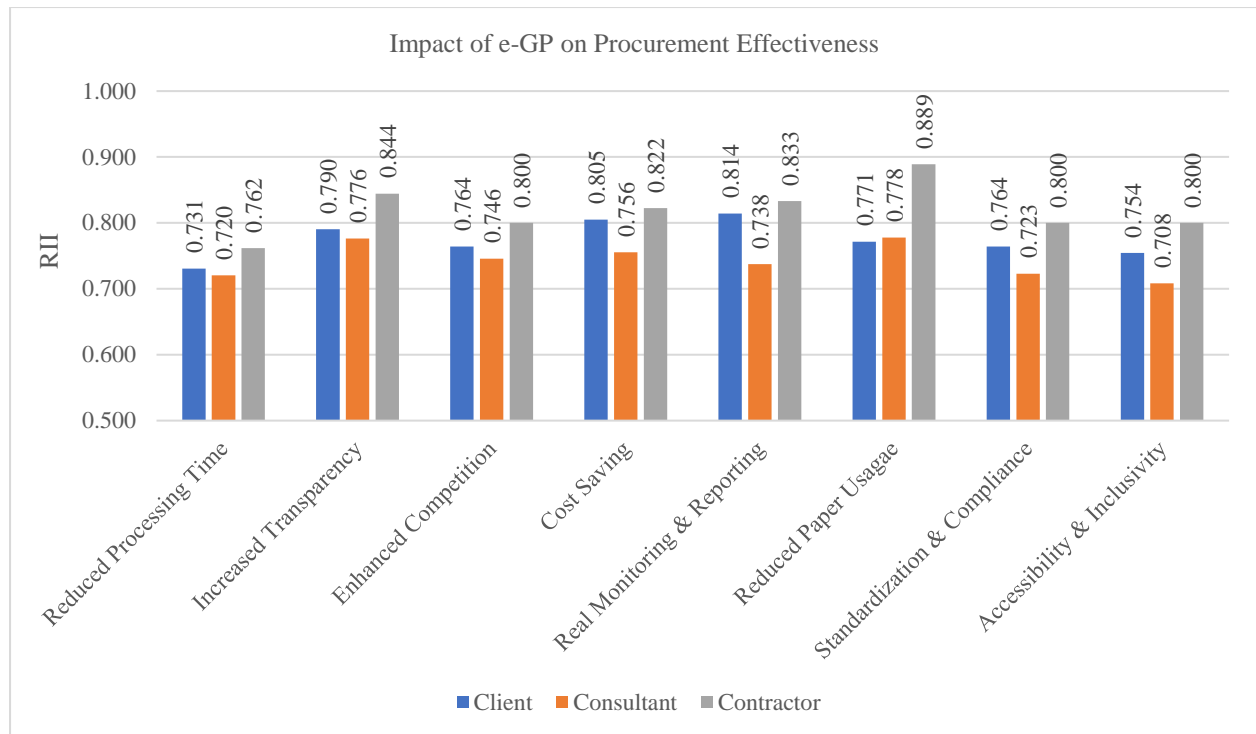


Figure 7: RII for Impact of e-GP on Procurement Effectiveness

The overall ranking from Figure 7 shows that reduced paper usage, increased transparency and real monitoring and reporting factors have the most impact on procurement effectiveness of building construction works at Jumla district. Similarly, accessibility & inclusivity and reduced processing time factors have the least impact on procurement effectiveness of building construction works at Jumla district.

5. Conclusion and Recommendations

Conclusions

Various theories and studies aim to elucidate the factors influencing E-government adaptation. These factors include reduced paper usage, heightened transparency, standardization, compliance, cost savings, and increased competition in building construction work procurement. Rigorous data collection and analysis reveal that the adoption of E-GP significantly enhances the efficiency of the procurement process. The E-GP platform facilitates transparent and auditable records of procurement activities related to building construction works.

E-procurement is beyond just an internet purchasing system. [13]. The implementation of the system aims to realize substantial benefits, including enhanced transparency, cost savings, and standardization and compliance. This study underscores the importance of government focus on infrastructure availability, such as IT and ICT, to improve e-procurement, not only for building construction works but also across all civil engineering construction projects. The findings highlight that the adoption of e-GP has significantly improved the procurement effectiveness of building construction work in the Jumla district.

Recommendation

The success of the e-procurement system relies on the competencies, skills, and professionalism of procurement officials. The proficiency of the workforce in government procurement significantly impacts the procurement process and outcomes, as well as the overall success of e-procurement initiatives. This study identifies potential areas for improvement, including user training, system optimization, and the utilization of data analytics. Enhancements in these areas can maximize the long-term benefits of e-GP across all civil engineering construction projects. Additionally, the government should prioritize investments in technological infrastructure, particularly in remote areas like the Jumla district. Access to stable internet connectivity and reliable power sources is essential for the successful implementation of e-GP.

Recommendation for Further Study

The Recommendations for further study are discussed below;

- Future work will need to work on cross-sectional country analysis, large survey, add more variables, and employ rigorous research methodologies interview, focus group discussion about the better understanding of perceived benefits of e-procurement.
- It also needs ICT enabled technologies in the government entities, strong empirical testing to validate all factors that influence the adoption of e-procurement systems.

Conflict of interest

No conflict of interest.

Acknowledgments

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References

- [1] D. Kartika, "The Impact of E-Procurement Implementation on Public Procurement's Corruption Cases; Evidence from Indonesia and India," *J. Kaji. Wil.*, vol. 11, no. 2, p. 193, 2022, doi: 10.14203/jkw.v11i2.841.
- [2] M. N. Mohd Nawi, S. Roslan, N. A. Salleh, F. Zulhumadi, and A. N. Harun, "The benefits and challenges of E-procurement implementation: A case study of Malaysian company," *Int. J. Econ. Financ. Issues*, vol. 6, no. 7Special Issue, pp. 329–332, 2016.
- [3] L. Del Vecchio, "The E-Procurement Process and How To Improve It," *Planergy*, pp. 1–7, 2022, [Online]. Available: <https://planergy.com/blog/e-procurement-process/>
- [4] P. Panda, G. P. Sahu, and P. Gupta, "E-Government Procurement Implementation : Necessity of National Procurement Law," 2010, doi: Panda, Prabir and Sahu, G. P. and Gupta, Pramod, E-Government Procurement Implementation: Necessity of National Procurement Law (July 20, 2011). Available at SSRN: <https://ssrn.com/abstract=1898759> or <http://dx.doi.org/10.2139/ssrn.1898759>.
- [5] P. Y. Chu and S. Y. Chiang, "A study of establishing evaluation indices for open government data," *Proc. Eur. Conf. e-Government, ECEG*, vol. 2014-Janua, no. June, pp. 393–401, 2014.
- [6] D. Shrestha, B. Devkota, and S. R. Jeong, "Challenges and Factors affecting E-governance practices in Nepal," no. December, pp. 1–53, 2016, doi: 10.1109/skima.2015.7399981.
- [7] A. Neupane, "The Potential of Public E-Procurement Technology To Reduce Corruption in Public Procurement," University of Southern Queensland, 2014.
- [8] S. N. Kane, A. Mishra, and A. K. Dutta, "Preface: International Conference on Recent Trends in Physics (ICRTP 2016)," *J. Phys. Conf. Ser.*, vol. 755, no. 1, 2016, doi: 10.1088/1742-6596/755/1/011001.
- [9] K. K. Soong, E. M. Ahmed, and K. S. Tan, "Factors Affecting Malaysia's SMEs in Using Public Electronic Procurement," *J. Inf. Knowl. Manag.*, vol. 19, no. 2, 2020, doi: 10.1142/S0219649220500082.
- [10] E. S. Kassim and H. Hussin, "Public e-procurement: A research synthesis," *IC4E 2010 - 2010 Int. Conf. e-Education, e-Business, e-Management e-Learning*, no. May 2016, pp. 150–154, 2010, doi: 10.1109/IC4E.2010.93.
- [11] N. A. Panayiotou, S. P. Gayialis, and I. P. Tatsiopoulou, "An e-procurement system for governmental purchasing," *Int. J. Prod. Econ.*, vol. 90, no. 1, pp. 79–102, 2004, doi: 10.1016/S0925-5273(03)00103-8.
- [12] P. Panda, G. P. Sahu, and P. Gupta, "Promoting Transparency and Efficiency in Public Procurement : E-Procurement Initiatives by Government of India," *7th Int. Conf. E-Government 2010*, no. January, pp. 22–24, 2010.
- [13] P. Patel, *A Study of E-Procurement Practices in Selected Organizations in Gujarat " A Study of E-Procurement Practices in Selected Organizations in Gujarat " A Thesis submitted to Gujarat Technological University for the Award of Doctor of Philosophy in By Prakashk*, no. May 2017. 2017.