Report On

Role of e-GP in building Smart Bangladesh

By

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An internship report submitted to BRAC Institute of Governance and Development (BIGD), in partial fulfillment of the requirements for the degree of “Masters in Procurement and Supply Management.”

BRAC Institute of Governance and Development (BIGD)
BRAC University
July 2023

Declaration

It is hereby declared that.

1. The internship report submitted is my own original work while completing degree at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Letter of Transmittal

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Subject: **Submission of PSM-665: Role of e-GP in building Smart Bangladesh**

Dear Sir

With due respect and humble submission, I would like to take the privilege to submit my internship report entitled **'Role of e-GP in building Smart Bangladesh'** as a partial requirement to fulfillment of MPSM at BIGD, BRAC University.

I have tried my best to complete the report with the essential information and suggested proposition in the exceedingly vital compact and comprehensive manner as possible. I believe that this report will be meeting the benchmark of the academic report in the best possible manner.

Sincerely yours,

_____

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Date: July 31, 2023

Non-Disclosure Agreement

This agreement has been made and entered into by and between as the First Party and the undersigned student at BRAC Institute of Governance and Development, BRAC University as the Second Party. The First Party has allowed the Second Party to prepare a report on **Role of e-GP in building Smart Bangladesh** in partial fulfillment of the requirements for the degree of Masters of Procurement and Supply Management. The Second Party will have the opportunity to work closely with the officials of the organization and have access to official data and information. Based on work experience, data, and information collected the Second Party will prepare a report. The Second Party will use all sorts of data and information for academic purposes and will not disclose to any party against the interests of the First Party.

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Acknowledgement

I would express my utmost gratitude to Almighty Allah for granting us the opportunity and determination to successfully complete this report, all under the invaluable guidance of my esteemed supervisor, Tarun Kumar Acharya, Team Leader, DSM, DCNUP. His consistent motivation, inspirational insights, and expert guidance have been instrumental in steering me towards the completion of my report.

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Executive Summary

E-Government Procurement (e-GP) has emerged as a game-changer in Bangladesh, revolutionizing public procurement practices and contributing to the vision of building a Smart Bangladesh. This report delves into the role of e-GP in enhancing transparency, efficiency, digital transformation, empowering SMEs, and promoting sustainability. It examines the evolution of e-GP in Bangladesh, its key features, and its integration with the Smart Bangladesh initiative. The report evaluates the impact of e-GP implementation through case studies and success stories, highlighting significant improvements in procurement outcomes, cost savings, and increased competition. Additionally, it identifies challenges such as technical issues, capacity building needs, legal frameworks, and cybersecurity concerns. Finally, the report proposes recommendations for strengthening e-GP infrastructure, enhancing stakeholder collaboration, and fostering innovation to unlock its full potential in driving sustainable procurement and economic development.

Keywords: e-Government Procurement, Smart Bangladesh, Transparency, Efficiency, Digital Transformation, SMEs, Sustainability, Public Procurement.

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List of Acronyms

ICT	*Information and Communication Technology*
e-GP	*Electronic Government Procurement*
BPPA	*Bangladesh Public Procurement Authority*
CPTU	*Central Procurement Technical Unit*
SMEs	*Small and Medium Enterprises*
ADP	*Annual Development Programme*
PROMIS	*Procurement Management Information System*
BI	*Business Intelligence*
IoT	*Internet of Things*
AI	*Artificial Intelligence*
SDGs	*Sustainable Development Goals*
8FYP	*8th Five Year Plan*
LGED	*Local Government Engineering Department*
RHD	*Roads and Highways Department*
BWDB	*Bangladesh Water Development Board*
REB	*Rural Electrification Board*
MPSM	*Masters in Procurement and Supply Management*
BIGD	*BRAC Institute of Governance and Development*

I. Introduction

1.1 Overview of e-GP

The evolution of e-Government Procurement (e-GP) in Bangladesh has been a crucial aspect of the country's digital transformation journey. Bangladesh, a nation in South Asia, has shown significant progress and development across various sectors, even amidst global uncertainties (Ahmed et al., 2023). By leveraging Information and Communication Technology (ICT) and under the proactive leadership of the government, Bangladesh has achieved notable milestones, such as meeting Millennium Development Goals, launching its first satellite (Bangabandhu-1), and enhancing infrastructure development with projects like the Padma Multipurpose Bridge and the Metro Rail (Ahmed et al., 2023).

As Bangladesh strives to achieve Sustainable Development Goals, the 8th Five-Year Plan, the Perspective Plan 2041, and the vision of a Smart Bangladesh have become central to its development agenda (Pal, S. K. et al., 2023). However, challenges like cybercrime and inadequate cybersecurity policies pose threats to the realization of a Smart Bangladesh (Pal, S. K. et al., 2023).

The implementation of the e-GP system by the Bangladesh Public Procurement Authority (BPPA) has transformed public procurement practices in the country. The e-GP system has not only resulted in significant cost savings but has also streamlined procurement processes, enhancing efficiency, competition, and transparency (BSS, Dhaka, 2023). The system has facilitated the tendering of contracts worth billions of Takas, with a significant portion of the national budget and the Annual Development Programme being allocated through e-GP (News Source 1-6).

Efficiency in contract awards has significantly improved, with a higher percentage of contracts being awarded within the stipulated timeframe. Moreover, the system has increased competition, as evidenced by the rise in the average number of participants in each tender. The e-GP system has been acknowledged for its reliability and dynamism, benefiting both procuring entities and tenderers across the country (News 10).

In the realm of education and professional development, programs like the Masters in Procurement and Supply Management (MPSM) at Brac University aim to produce highly competent procurement and supply management professionals to meet the demands of the 21st century (MPSM, BRAC). With Bangladesh experiencing robust economic growth, the need for skilled procurement and supply professionals is on the rise to effectively manage the expanding scope and complexity of procurement functions in both public and private sectors (MPSM, BRAC).

The journey of e-GP in Bangladesh reflects the country's commitment to leveraging technology for efficient governance and economic development. By embracing digital solutions like e-GP, Bangladesh has not only enhanced transparency and competition in public procurement but has also paved the way for a more sustainable and digitally inclusive future.

1.2 Importance of Building a Smart Bangladesh

Smart Bangladesh embodies the vision of a technologically advanced and digitally inclusive nation achieved through the strategic integration of Information and Communication Technology (ICT) into various sectors. The concept of Smart Bangladesh aligns with broader goals such as the Sustainable Development Goals (SDGs), the 8th Five-Year Plan (8FYP), the Perspective Plan 2041, and the Delta Plan 2100. As Bangladesh transitions into the fourth industrial age, the idea of Smart Bangladesh has gained prominence, symbolizing a shift towards a more connected, efficient, and innovative society (Ahmed et al., 2023).

The progression towards Smart Bangladesh has been marked by significant achievements in various domains. Bangladesh has demonstrated notable progress in areas such as poverty reduction, food security, primary education, mortality ratio, immunization coverage, and combating communicable diseases, showcasing the country's dedication to holistic development. Additionally, infrastructure projects like the Padma Multipurpose Bridge, Bangabandhu Tunnel, Metro Rail, and Rooppur Nuclear Power Plant have not only improved connectivity but have also established the groundwork for a more sustainable and resilient infrastructure network (Pal, S. K. et al., 2023).

A crucial element of Smart Bangladesh is the effective utilization of e-Government Procurement (e-GP) systems. The implementation of e-GP has transformed public procurement practices in Bangladesh, resulting in significant cost savings, enhanced efficiency, competition, and transparency in procurement processes (News 5). The e-GP system has streamlined tendering processes, leading to the award of contracts worth billions of Takas, with a substantial portion of the national budget and the Annual Development Programme being allocated through this system (News 6).

Nevertheless, challenges such as cybercrime and inadequate cybersecurity policies pose threats to the realization of Smart Bangladesh. Addressing these challenges and reinforcing cybersecurity frameworks are crucial to safeguarding the digital infrastructure and ensuring the sustainable growth of Smart Bangladesh (Nironjon Roy, 2023)

Moreover, initiatives like the Masters in Procurement and Supply Management (MPSM) at Brac University play a pivotal role in cultivating highly competent procurement and supply management professionals to meet the evolving demands of the 21st century. As Bangladesh's economy continues to expand, the demand for skilled procurement professionals becomes increasingly vital to effectively manage the expanding scope and complexity of procurement functions in both public and private sectors (MPSM, BRAC).

Smart Bangladesh epitomizes the vision of a technologically advanced and digitally empowered nation, driven by innovation, efficiency, and inclusivity. Through leveraging ICT, enhancing infrastructure, and strengthening procurement practices, Bangladesh is on track to realize its vision of Smart Bangladesh, paving the way for sustainable development and economic prosperity.

1.3 e-GP Contribution to Building Smart Bangladesh

Electronic Government Procurement (e-GP) plays a crucial role in advancing the vision of building a Smart Bangladesh by contributing to efficiency, transparency, and accountability in public procurement processes. The implementation of e-GP aligns

with the broader goal of utilizing technological advancements to enhance governance and foster sustainable economic growth in the country Rashid & Uddin (2021). The e-GP system, as envisioned by the Central Procurement Technical Unit (CPTU), aims to enhance the efficiency and transparency of the public procurement system in Bangladesh (Khorana & Kerr, 2021). By integrating e-GP into the procurement processes, Bangladesh can streamline transactions, automate workflows, and reduce processing costs, thereby increasing efficiency and effectiveness in public procurement activities. The adoption of e-GP facilitates the integration and automation of various workflow processes, leading to improved efficiency and reduced overhead costs associated with procurement. Moreover, e-GP systems contribute to minimizing risks in the procurement of goods and services, enhancing user experiences through quality electronic procurement platforms, and improving accountability and transparency in government transactions. Furthermore, the implementation of e-GP supports the broader digital transformation initiatives in Bangladesh, contributing to the country's journey towards becoming a Smart Nation. By leveraging e-GP systems, Bangladesh can enhance its digital infrastructure, promote sustainable practices, and drive innovation across various sectors, including agriculture, healthcare, and governance. The integration of e-GP into the vision of Smart Bangladesh enables the government to deliver services more efficiently, improve decision-making processes, and enhance overall governance practices.

1.4. The Key Objectives and Scopes

The main objectives of this report are:

1. To provide an in-depth understanding of e-Government Procurement (e-GP) and its evolution in Bangladesh.
2. To examine the Smart Bangladesh initiative and its goals of leveraging technology for socio-economic development.
3. To analyze the role and contribution of e-GP in building a Smart Bangladesh by enhancing transparency, efficiency, digital transformation, empowering SMEs, and promoting sustainability.

4. To evaluate the successful implementation of e-GP in Bangladesh, including case studies, impact on procurement outcomes, and lessons learned.
5. To identify the challenges and limitations associated with e-GP implementation, such as technical issues, capacity building needs, legal and regulatory frameworks, and cybersecurity concerns.
6. To propose recommendations for improving the e-GP infrastructure, technology, capacity building programs, legal and policy reforms, and stakeholder collaboration to support the vision of a Smart Bangladesh.

The scope of this report encompasses:

- A comprehensive overview of e-GP, its key features, and its evolution in Bangladesh.
- An exploration of the Smart Bangladesh initiative and the importance of technology in achieving its goals.
- A detailed analysis of the role of e-GP in promoting transparency, accountability, efficiency, digital transformation, empowering SMEs, and fostering sustainability.
- Case studies and success stories showcasing the impact of e-GP implementation on procurement outcomes in Bangladesh.
- Identification of challenges and limitations related to technical, capacity building, legal and regulatory, and cybersecurity aspects of e-GP implementation.
- Recommendations for strengthening the e-GP infrastructure, enhancing capacity building efforts, reforming legal and policy frameworks, and fostering stakeholder collaboration to support the Smart Bangladesh vision.

This report aims to provide a comprehensive understanding of e-GP and its pivotal role in driving the digital transformation and modernization of public procurement processes in Bangladesh, aligning with the broader goals of building a Smart Bangladesh through technological advancements and sustainable practices.

II. Methodology

To conduct a comprehensive study on the role of e-Government Procurement (e-GP) in building a Smart Bangladesh, a mixed-method research approach was adopted. This approach combined both qualitative and quantitative techniques, allowing for a holistic understanding of the topic and triangulation of findings.

Data Collection

Primary Data Collection

1. **Semi-structured Interviews:** Key stakeholders, including government officials, procurement experts, representatives from the Central Procurement Technical Unit (CPTU), and e-GP system users, were interviewed. The interviews aimed to gather in-depth insights, experiences, and perspectives regarding the implementation, challenges, and impact of e-GP in Bangladesh.
2. **Focus Group Discussions:** Focus group discussions were conducted with various stakeholder groups, such as Small and Medium Enterprises (SMEs), local businesses, and civil society organizations. These discussions provided valuable qualitative data on the role of e-GP in empowering SMEs, promoting transparency, and fostering sustainable procurement practices.
3. **Field Observations:** Researchers conducted field observations at selected government agencies and procurement entities to witness the practical implementation of e-GP systems and gather first-hand data on the operational aspects, user experiences, and challenges faced.

Secondary Data Collection

1. **Literature Review:** A comprehensive review of existing literature, including research papers, government reports, industry publications, and relevant databases, was conducted to gather secondary data on e-GP implementation, best practices, and its impact on various aspects of procurement and governance.
2. **Statistical Data Analysis:** Relevant statistical data from official sources, such as the Bangladesh Public Procurement Authority (BPPA), CPTU, and other government agencies, were analyzed to assess the quantitative impact of e-GP on procurement outcomes, cost savings, and efficiency.
3. **Case Studies and Success Stories:** Published case studies and success stories related to e-GP implementation in Bangladesh were examined to draw insights, lessons learned, and best practices.

By employing a mixed-method approach and leveraging both primary and secondary data sources, this study aimed to provide a comprehensive and well-rounded analysis of the role of e-GP in building a Smart Bangladesh. The methodology ensured the collection of diverse perspectives, the integration of qualitative and quantitative insights, and the triangulation of findings to support the development of actionable recommendations and strategies.

III. Understanding e-GP

E-Government Procurement (e-GP) has undergone significant evolution in Bangladesh over time, reflecting the country's commitment to modernizing procurement processes and embracing digital transformation. The evolution of e-GP in Bangladesh can be traced through various phases, each marked by advancements in technology, policy initiatives, and the adoption of best practices in public procurement.

Initially, the introduction of e-GP in Bangladesh marked a significant shift towards digitizing procurement processes and enhancing transparency and efficiency in government transactions (Rashid & Uddin, 2021). The Central Procurement Technical Unit (CPTU) played a pivotal role in spearheading the e-GP vision, aiming to streamline procurement activities and improve the overall effectiveness of the public procurement system (Rashid & Uddin, 2021).

Over the years, Bangladesh has made notable progress in leveraging e-GP systems to enhance the efficiency and transparency of procurement processes. The implementation of e-GP has enabled the integration and automation of workflow processes, leading to improved efficiency and reduced processing costs associated with procurement activities (Rashid & Uddin, 2021).

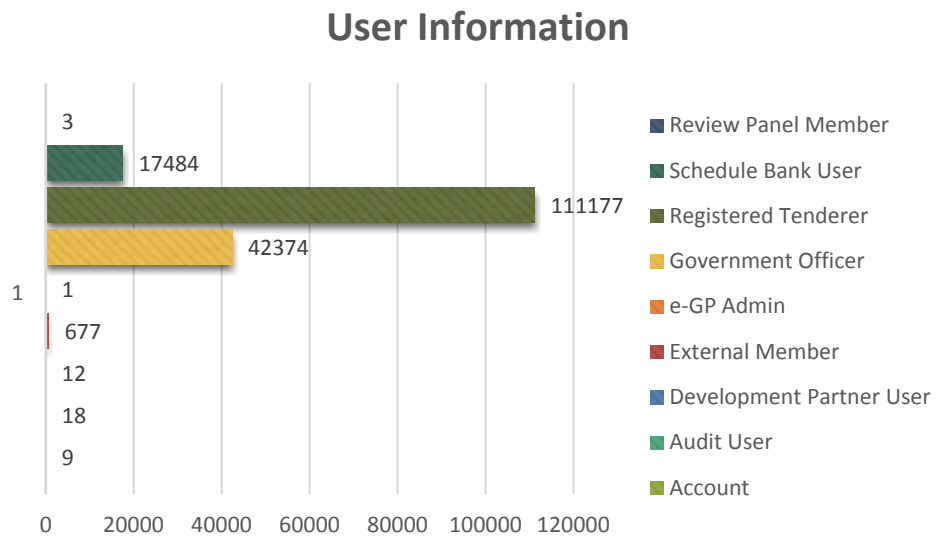

Figure 1: Users Information

The e-GP system witnessed a steady growth in its user base, with the total number of users increasing from 148,641 in 2021 to 149,883 in 2022. Among the user categories, the number of registered tenderers saw the most significant increase, from 95,474 in 2021 to 96,461 in 2022, indicating higher participation from suppliers. Additionally, the number of government officers increased from 36,548 to 36,771, and the number of schedule bank users grew from 16,031 to 16,061 during the same period.

Additionally, the adoption of e-GP has contributed to minimizing risks in the procurement of goods and services, enhancing user experiences through quality electronic procurement platforms, and promoting accountability and transparency in government transactions (Rashid & Uddin, 2021).

Furthermore, the evolution of e-GP in Bangladesh has been supported by advancements in information and communication technologies, as well as the continuous efforts to enhance the digital infrastructure of the country. The government's commitment to promoting e-GP as part of its broader e-Governance initiatives has been instrumental in driving the evolution of digital procurement practices in Bangladesh (Malla, 2021).

Looking ahead, the future evolution of e-GP in Bangladesh is likely to focus on further enhancing the efficiency, transparency, and accountability of procurement processes through the adoption of advanced technologies such as artificial intelligence, machine learning, and blockchain. By embracing these innovations, Bangladesh can continue to strengthen its procurement ecosystem, promote sustainable practices, and drive economic growth in line with its vision of building a Smart Nation.

The key features and components of the e-GP system

The key features and components of the e-Government Procurement (e-GP) system in Bangladesh play a crucial role in enhancing transparency, efficiency, and accountability in public procurement processes. The evolution of the e-GP system in Bangladesh has led to the integration of various components and features that contribute to its effectiveness. Some of the key features and components of the e-GP system in Bangladesh include:

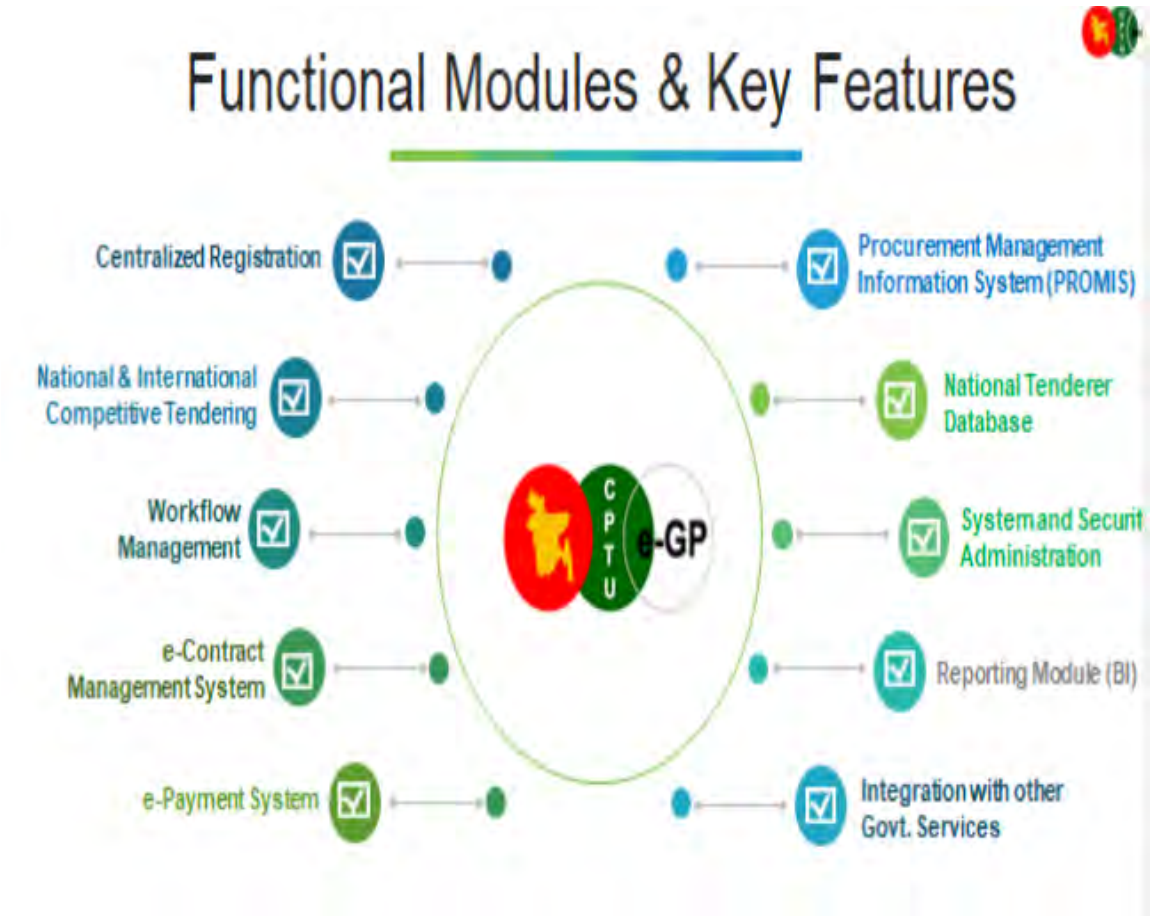

Figure 2: Functional Modules & Key Features

1. **Centralized registration:** Enables easy access for government entities and tenderers by providing a centralized registration system.
2. **Procurement Management Information System (PROMIS):** Acts as the core system for managing procurement processes efficiently within the e-GP framework.
3. **National and International Competitive Tendering:** Facilitates fair competition and broad access to suppliers at both national and international levels.
4. **National Tenderer Database:** Central repository of qualified suppliers that enhances procurement efficiency within the e-GP system.
5. **Workflow Management:** Allows tracking and monitoring of procurement activities at different stages, ensuring transparency and accountability.
6. **System and Security Administration:** Essential for maintaining the integrity and security of the e-GP platform, safeguarding sensitive procurement data.

7. **e-Contract Management System:** Supports digital management of contracts, improving contract performance and compliance monitoring.
8. **Reporting Module (BI):** Provides valuable insights through data analytics, enabling informed decision-making and performance evaluation.
9. **e-Payment System:** Streamlines the payment process, reducing delays and enhancing financial efficiency within procurement transactions.
10. **Integration with other Govt. Services:** Ensures interoperability and data exchange between different government systems, promoting synergy and coherence in service delivery.

These key features and components collectively contribute to the efficiency, transparency, and effectiveness of the e-GP system, as evidenced by the significant improvements in procurement processes and outcomes in Bangladesh.

IV. The Smart Bangladesh Initiative

The "Smart Bangladesh Initiative" is an ambitious and forward-looking plan announced by the government of Bangladesh in December 2022, with the goal of transforming the country into a technologically advanced and digitally integrated nation by 2041. This initiative builds upon the success of the "Digital Bangladesh" program, which laid the foundation for digitizing government services and enhancing internet connectivity across the country. The "Smart Bangladesh Initiative" aims to take this digital transformation to the next level, leveraging cutting-edge technologies such as artificial intelligence (AI), the Internet of Things (IoT), big data analytics, and blockchain to create a truly "smart" nation.

The "Smart Bangladesh Initiative" is underpinned by four core pillars: smart citizens, smart government, smart society, and smart economy. The "smart citizens" pillar focuses on empowering the people of Bangladesh with digital literacy and a "digital-first" mindset, enabling them to actively participate in and contribute to the nation's technological advancement. This involves implementing widespread digital literacy campaigns and programs to equip citizens with the necessary skills and knowledge to navigate the digital landscape effectively.

The "smart government" pillar envisions the complete digitization of government services, with a focus on paperless offices, personalized service platforms, and seamless integration of advanced technologies across various sectors, including healthcare, education, agriculture, revenue management, and public security. This pillar aims to enhance the efficiency, transparency, and accessibility of government services, ensuring that citizens can access them conveniently and securely through digital channels.

The "smart society" pillar encompasses the creation of a technologically advanced and sustainable society, where citizens embrace digital ethics, values, and tolerance. This pillar includes the development of "smart cities" and "smart grids," as well as the implementation of a cashless payment ecosystem. By fostering a digitally inclusive

society, the "Smart Bangladesh Initiative" seeks to raise the overall living standards of its citizens and promote equitable progress.

Finally, the "smart economy" pillar focuses on leveraging information and communication technologies (ICT) as a revenue-generating sector, with the goal of creating a robust and globally competitive digital economy. By 2041, Bangladesh aims to nurture at least 50 unicorn startups and establish a thriving ICT economy worth $50 billion. This pillar recognizes the importance of fostering innovation, entrepreneurship, and technological advancements to drive economic growth and job creation.

While the "Smart Bangladesh Initiative" presents a bold and ambitious vision, its successful implementation will require a comprehensive and well-coordinated effort. The government must develop a concrete masterplan through extensive consultations with relevant stakeholders, including the private sector, academia, and civil society organizations. Additionally, regulatory frameworks must be promptly updated to support and protect emerging technologies, and policies must be put in place to encourage intellectual property valuation and protect technological innovations.

Moreover, human resource development is a critical component of the "Smart Bangladesh Initiative." Universities and educational institutions must embed emerging technologies into their curricula, bridging the gap between academia and industry. This will ensure that Bangladesh's workforce is equipped with the necessary skills and knowledge to thrive in a technologically advanced and digitally driven economy.

The "Smart Bangladesh Initiative" represents a bold and ambitious vision for the country's future, one that aims to harness the power of technology to drive economic growth, enhance government efficiency, promote social inclusion, and empower citizens. By focusing on the four pillars of smart citizens, smart government, smart society, and smart economy, Bangladesh has the potential to position itself as a leading player in the global digital economy and achieve its goal of becoming a high-income, poverty-free, and technologically advanced nation by 2041.

V. Role of e-GP in Building a Smart Bangladesh

A. Transparency and Accountability

E-Government Procurement (e-GP) systems are essential in enhancing transparency in procurement processes by implementing digital solutions that improve accountability and reduce corruption opportunities. These systems aim to centralize procurement activities, allowing for the transparent publication of tender notices, bid submissions, and contract awards (Barajei, 2023). Through the digitization of procurement processes, stakeholders can effectively monitor the entire procurement lifecycle, ensuring openness and fairness in the process. Furthermore, e-GP systems play a crucial role in combating corruption in public procurement by implementing mechanisms that enhance accountability and integrity. Research indicates that e-Procurement systems contribute significantly to reducing corruption by promoting transparency and accountability in procurement activities (Barajei, 2023). The transparency and accountability features of e-GP systems help mitigate the risks of procurement fraud and corruption by providing an audit trail of procurement transactions, aiding in the detection and prevention of corrupt practices (Barajei, 2023). By automating procurement processes and introducing checks and balances, e-GP systems establish a controlled environment that minimizes opportunities for corrupt activities. Additionally, e-GP systems enable the identification of red flags and irregularities in the procurement process, allowing authorities to promptly address potential corruption risks (Fazekas et al., 2016). By utilizing technology to monitor and analyze procurement data, e-GP systems can detect patterns of misconduct, collusion, and fraud, thereby enhancing the overall integrity of the procurement process (Fazekas et al., 2016). Moreover, these systems enhance the competitiveness of procurement by increasing transparency and ensuring a level playing field for all bidders, thereby reducing the likelihood of corrupt practices like bid rigging and favoritism (Fazekas et al., 2016). In conclusion, e-GP systems are instrumental in promoting transparency and combating corruption in public procurement processes through digital solutions that enhance accountability, integrity, and fairness. By leveraging technology to automate and monitor procurement activities, e-GP systems contribute to creating a transparent and efficient procurement environment, fostering trust, credibility, and good governance in public procurement.

B. Efficiency and Effectiveness

E-Government Procurement (e-GP) systems streamline procurement processes by digitizing and automating various stages of the procurement lifecycle. These systems facilitate the end-to-end management of procurement activities, from requisition to payment, through online platforms that centralize and standardize procurement procedures (Kumar & Ganguly, 2020). By integrating business processes and simplifying sub-processes related to procurement, e-GP systems enable the seamless flow of information and transactions, eliminating manual interventions and reducing the likelihood of errors or delays in the procurement process (Kumar & Ganguly, 2020). The shift towards paperless offices, facilitated by e-GP systems, contributes to cost savings and a more environmentally friendly work environment.

The automation of procurement workflows, such as bid submission, evaluation, and contract management, enhances the efficiency and effectiveness of procurement activities, leading to streamlined processes and improved operational productivity (Kumar & Ganguly, 2020). The implementation of e-GP systems is associated with significant time and cost savings in public procurement processes. By digitizing procurement activities, e-GP systems reduce the administrative burden and processing times traditionally associated with manual procurement methods (Nurmandi & Kim, 2015), fostering a hassle-free office environment. The automation of bidding processes, monitoring mechanisms, and procurement workflows accelerates the pace of procurement activities, enabling faster decision-making and execution of procurement transactions (Nurmandi & Kim, 2015).

Additionally, e-GP systems promote competition among suppliers, enhance market visibility, and facilitate price discovery, leading to cost savings through improved negotiation outcomes and optimized procurement strategies (Nurmandi & Kim, 2015). The transparency and accountability introduced by e-GP systems contribute to improved law and order in procurement practices. Studies have shown that e-Procurement systems can result in reduced procurement cycle times, administrative costs, and lead times, contributing to overall efficiency gains and financial savings for organizations (Ramkumar & Jenamani, 2015).

C. Digital Transformation

E-Government Procurement (e-GP) is the utilization of a transactional information system by government institutions and other public sector organizations to conduct and manage their procurement activities and supplier relationships for the acquisition of works, goods, and services needed by the public sector (Bosio, 2023). The adoption of e-GP systems allows organizations to digitalize procurement workflows, transitioning from manual, paper-based processes to automated, electronic platforms. This shift centralizes procurement activities, standardizes procedures, and enhances transparency and efficiency in the procurement process. The implementation of e-GP enables the digitization of bidding processes, contract management, and vendor interactions, resulting in improved accuracy, speed, and effectiveness in procurement operations. Furthermore, e-GP systems offer real-time access to procurement data, empowering stakeholders to seamlessly monitor and track procurement activities, thereby enhancing visibility and control over the entire procurement lifecycle. Integrating e-GP with other digital initiatives in Bangladesh can further enhance the efficiency and effectiveness of public procurement processes. By aligning e-GP systems with broader digital transformation strategies, organizations can capitalize on synergies between different digital platforms and initiatives to optimize procurement outcomes (Bosio, 2023). For instance, integrating e-GP with digital payment systems can streamline financial transactions, enhance budget management, and improve accountability in procurement spending. Additionally, linking e-GP with data analytics tools can provide organizations with valuable insights into procurement trends, supplier performance, and cost optimization strategies. Through the integration of e-GP with other digital initiatives like e-Invoicing, e-Contract Management, and e-Marketplaces, organizations can establish a comprehensive digital ecosystem that promotes collaboration, transparency, and innovation in procurement practices. Overall, integrating e-GP with other digital initiatives in Bangladesh can result in enhanced operational efficiency, cost reduction, and improved governance in public procurement processes. In conclusion, e-GP systems are pivotal in the transition from traditional to digital procurement processes by introducing automation, transparency, and efficiency in procurement activities. By integrating e-GP with other digital initiatives, organizations can harness technology's power to optimize procurement operations, drive innovation, and achieve

strategic procurement objectives in alignment with the vision of building a Smart Bangladesh.

D. Empowering SMEs and Local Businesses

E-Government Procurement (e-GP) is essential in providing access to government procurement opportunities for Small and Medium Enterprises (SMEs) and local businesses by offering a transparent and efficient platform for participating in public tenders and contracts. Through e-GP systems, SMEs and local businesses can easily access information on government procurement opportunities, submit bids electronically, and compete on a level playing field with larger enterprises. The digitalization of procurement processes streamlines the bidding process, reduces barriers to entry, and enhances the visibility of procurement opportunities for SMEs and local businesses. By facilitating online interactions and transactions, e-GP systems enable SMEs to overcome traditional procurement challenges, such as limited access to information, bureaucratic hurdles, and resource constraints, thereby empowering them to actively engage in government procurement activities Rahayu & Day (2015)Zhou et al., 2016; Changalima, 2023). Furthermore, e-GP can promote competitiveness and innovation in the private sector by fostering a more inclusive and dynamic procurement environment that encourages participation from a diverse range of suppliers, including SMEs and local businesses. By providing equal access to procurement opportunities and promoting fair competition, e-GP systems create a conducive ecosystem for SMEs to showcase their capabilities, offer innovative solutions, and demonstrate their competitiveness in the marketplace. The transparency and efficiency of e-GP processes enable SMEs to showcase their expertise, build credibility, and establish long-term partnerships with government agencies and other buyers. Additionally, e-GP systems can drive innovation in the private sector by encouraging SMEs to develop new products, services, and solutions that meet the evolving needs of government procurement requirements. By integrating e-GP with other digital initiatives, such as e-commerce platforms, digital marketing capabilities, and internet-based networking tools, SMEs can enhance their visibility, expand their market reach, and leverage technology to drive competitiveness and innovation in the private sector (Akenroye et al., 2022; Tiwasing & Sawang, 2021; Namagembe et al., 2021).

E. Sustainability and Environment

Green procurement practices facilitated by e-Government Procurement (e-GP) involve a variety of environmentally friendly strategies and initiatives aimed at reducing the environmental impact of procurement activities. Organizations can utilize e-GP systems to prioritize the procurement of goods and services that meet sustainability criteria, such as energy efficiency, recyclability, and reduced carbon footprint. These practices include sourcing environmentally friendly products, advocating for the use of renewable resources, minimizing waste generation, and supporting suppliers with strong environmental credentials Sparrevik et al. (2018) Kumar & Chakraborty, 2022). By integrating green procurement criteria into the procurement process, e-GP systems empower organizations to make environmentally responsible purchasing decisions that contribute to sustainable development and environmental conservation efforts. These practices not only benefit the environment but also enhance the organization's reputation, stakeholder relationships, and compliance with environmental regulations. Additionally, green procurement practices facilitated by e-GP systems can lead to better value for money by considering the total life cycle costs of products and services, including their environmental impact. The potential environmental impact of implementing e-GP is substantial and multifaceted, offering various benefits that support environmental sustainability and conservation. By promoting green procurement practices, e-GP systems can decrease the carbon footprint of organizations, reduce waste generation, and encourage the adoption of eco-friendly products and services (Kumar & Chakraborty, 2022; Giné et al., 2022). The implementation of e-GP can result in a decrease in greenhouse gas emissions, energy consumption, and resource depletion through the procurement of environmentally sustainable goods and services. Additionally, e-GP systems can stimulate innovation in green technologies, prompt suppliers to embrace eco-friendly practices, and cultivate a culture of environmental responsibility within organizations (Giné et al., 2022). The environmental impact of e-GP implementation extends beyond individual organizations to influence industry practices, supply chain sustainability, and overall environmental stewardship. By incorporating green procurement principles into e-GP systems, organizations can contribute to a more sustainable and environmentally conscious procurement ecosystem that aligns with global environmental goals and initiatives.

F. Value for Money:

The implementation of e-Government Procurement (e-GP) systems in Bangladesh has significantly contributed to achieving value for money in public procurement processes. By leveraging digital technologies and streamlining procurement activities, e-GP has enabled the government to optimize resource utilization, reduce costs, and enhance the overall efficiency of procurement operations (Rashid & Uddin, 2021).

One of the keyways e-GP delivers value for money is through increased competition and transparency. The e-GP platform provides equal access to procurement opportunities for all qualified suppliers, including small and medium enterprises (SMEs) and local businesses (Namagembe et al., 2021). This level playing field encourages broader participation, leading to more competitive bids and ultimately better value for money in terms of price and quality (Changalima, 2023).

Moreover, e-GP systems have automated and standardized procurement workflows, reducing manual interventions and minimizing the risk of errors and delays. This automation has resulted in faster processing times, shortened procurement cycles, and improved operational efficiency (Kumar & Ganguly, 2020). By streamlining processes, e-GP has significantly reduced administrative burdens and associated costs, allowing procurement entities to focus on strategic aspects of procurement and achieve better value for money (Nurmandi & Kim, 2015).

The transparency and accountability features embedded in e-GP systems have also contributed to cost savings by reducing the potential for corruption and fraudulent practices. The real-time monitoring and auditing capabilities of e-GP platforms enable effective oversight and detection of irregularities, promoting integrity and fiscal responsibility in public procurement (Barajei, 2023; Fazekas et al., 2016).

Furthermore, e-GP has facilitated data-driven decision-making and strategic procurement planning. The system generates valuable insights and analytics on procurement trends, supplier performance, and market dynamics. This information empowers procurement entities to make informed decisions, negotiate better deals, and

optimize procurement strategies to achieve the best value for money (Ramkumar & Jenamani, 2015).

The successful implementation of e-GP in Bangladesh has yielded tangible results in terms of cost savings and improved procurement outcomes. The World Bank estimates that Bangladesh can save approximately $1.1 billion annually through the effective utilization of the e-GP system ("Raw Data Source.", n.d.). These savings can be redirected towards other developmental priorities, maximizing the impact of public funds and delivering better value for money to citizens.

In conclusion, the e-GP system has been instrumental in driving value for money in public procurement processes in Bangladesh. By enhancing competition, transparency, efficiency, and data-driven decision-making, e-GP has enabled the government to optimize resource allocation, reduce costs, and achieve better procurement outcomes (Rashid & Uddin, 2021). As Bangladesh continues its journey towards building a Smart Nation, the e-GP system will remain a crucial tool in ensuring sustainable and cost-effective public procurement practices that deliver maximum value for money to the nation and its citizens.

VI. Case Studies and Success Stories

Successful examples of e-Government Procurement (e-GP) implementation in Bangladesh have demonstrated significant improvements in procurement outcomes, efficiency, transparency, and cost savings. The Bangladesh Public Procurement Authority (BPPA) and the Central Procurement Technical Unit (CPTU) have spearheaded the adoption of e-GP systems, transforming traditional procurement practices into streamlined, digital processes ("Raw Data Source.", n.d.). Through e-GP implementation, Bangladesh has achieved remarkable success in enhancing the efficiency of procurement operations, reducing processing times, and increasing transparency in government procurement activities. The e-GP system has facilitated the invitation of tenders, bid submissions, and contract awards through online platforms, significantly reducing the average procurement processing time from 100 days to 57 days ("Raw Data Source.", n.d.).

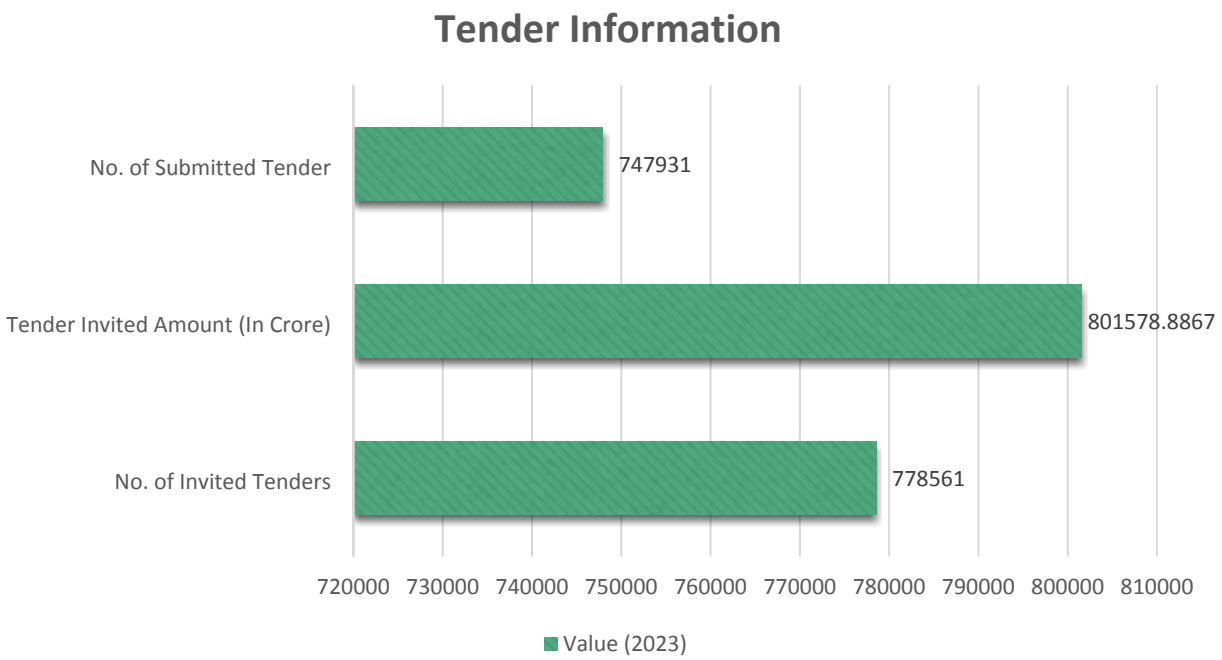

Figure 3: Tender Information

In 2022, the e-GP system facilitated the invitation of 778,561 tenders, amounting to a total value of BDT 801578.8867 crore. The number of submitted tenders was 747931 in 2023, compared to 525,735 in 2021. These numbers demonstrate the growing adoption and utilization of the e-GP system for tendering processes.

Moreover, e-GP implementation has led to substantial cost savings, with Bangladesh estimated to save $1.1 billion annually through the use of the e-GP system, according to the World Bank ("Raw Data Source.", n.d.). The system has not only improved operational efficiency but also generated revenue for the government, with about 40% of the national budget and 80% of the Annual Development Programme (ADP) being spent on public procurement ("Raw Data Source.", n.d.). The impact of e-GP on government procurement outcomes in Bangladesh has been profound, with notable improvements in efficiency, transparency, and cost savings. The e-GP system has revolutionized procurement practices by automating processes, enhancing competition, and increasing transparency in procurement activities ("Raw Data Source.", n.d.). Efficiency in contract award timelines has significantly improved, with the contract award rate rising from 10% to 90% within stipulated timeframes ("Raw Data Source.", n.d.). The average number of participants in each tender has also increased, indicating enhanced competition and market engagement facilitated by the e-GP system. Moreover, the system has contributed to greater transparency in procurement processes,

enabling stakeholders to monitor and track procurement activities in real-time, thereby fostering accountability and integrity in government transactions.
The implementation of e-GP has not only streamlined procurement operations but has also resulted in substantial cost savings, demonstrating the system's effectiveness in optimizing procurement expenditure and resource utilization.

Key lessons learned and best practices from e-GP projects in Bangladesh underscore the importance of stakeholder engagement, capacity building, and continuous improvement in procurement processes. Successful e-GP implementation requires strong leadership, stakeholder collaboration, and effective change management strategies to ensure smooth adoption and integration of the system ("Raw Data Source.", n.d.). Capacity building initiatives, such as training programs for government officials, registered tenderers, and bankers, are essential for enhancing the competencies and skills needed to effectively utilize the e-GP system ("Raw Data Source.", n.d.). Continuous monitoring, evaluation, and feedback mechanisms are critical for identifying areas of improvement, addressing challenges, and optimizing the performance of the e-GP system. By incorporating best practices such as transparency, accountability, and sustainability into e-GP projects, Bangladesh can further enhance the efficiency, effectiveness, and impact of government procurement activities, setting a benchmark for digital transformation in public procurement.

Overall progress of e-GP is shown below:

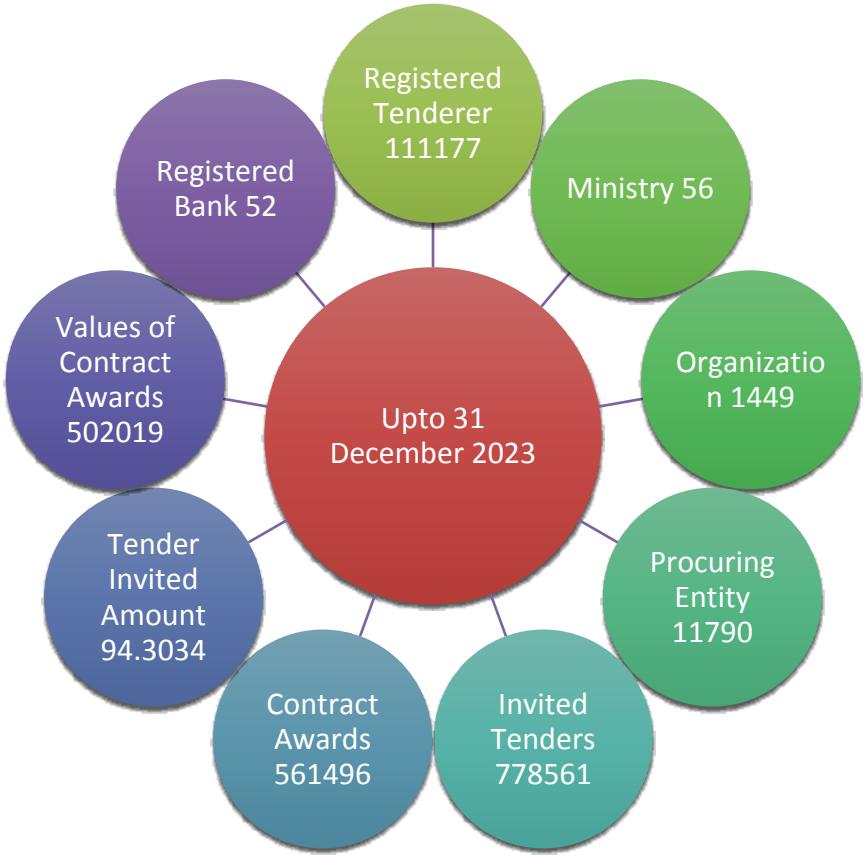

Figure 4: Overall progress of e-GP

The e-GP portal was inaugurated on 2 June 2011 in Bangladesh. e-GP embarked on its journey with four target agencies LGED, RHD, BWDB, and REB, aiming to gradually cover all procuring entities across the country. Over a decade, significant progress has already been made in public sector organizations due to the gradual progress of the e-GP system. From the beginning of the e-GP portal's inauguration up to December 2023, the number of total registered tenderers in the e-GP system is 111,177, registered banks 52, number of organizations 1,449, tenders invited 778,561, contracts awarded 561,496, and participants in e-GP training is 34,846 (www.eprocure.gov.bd). From the very beginning to December 2023, a total of 778,561 tenders have been invited by the e-GP system. In addition to that, different categories of other progress are mentioned below:

- Percentage share of rejected bids decreased from 8% (FY12) to 3% (FY19).
- Estimated 497 million km of travel distance reduction and, as a result, a decrease of 153,559 tons of CO2 emission.
- 1,053 million pages of papers saved.

- Integration with the Achallan System.
- Implementation of the Tenderer Database.
- Integration with the iBAS++ System.
- Financial Year-wise Annual Procurement Plan.
- Development of International Competitive Tender.

VII. Challenges and Limitations

1. Technical Challenges:

- Availability of reliable internet connectivity and adequate IT infrastructure
- Power outages hindering seamless functioning of e-GP platforms.
- Ensuring interoperability and integration of e-GP systems with existing government databases and IT systems

2. Capacity Building and Training Requirements:

- Need for comprehensive training programs for government officials, procurement officers, registered tenderers, and bankers.
- Building necessary skills and competencies to effectively utilize e-GP platforms.
- Continuous training and professional development opportunities to keep stakeholders updated with technological advancements and regulatory changes.

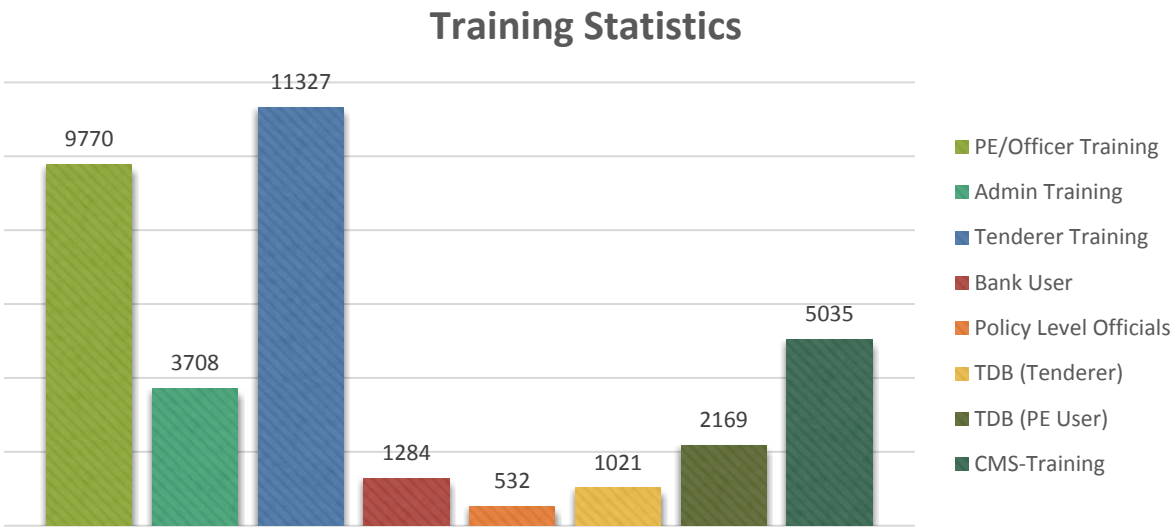

Figure 5: Training Information

3. Legal and Regulatory Framework:

- Need for clear and comprehensive procurement laws, guidelines, and policies to govern e-GP processes.
- Ensuring compliance with procurement regulations and upholding transparency and accountability

- Addressing aspects such as data privacy, security, contract management, and dispute resolution
- Regulatory oversight and enforcement mechanisms to monitor e-GP implementation and address compliance issues.

4. Cybersecurity Concerns:

- Risks of data breaches, unauthorized access, and system vulnerabilities
- Compromising the integrity and confidentiality of procurement information
- Need for robust security measures, encryption protocols, access controls, multi-factor authentication, and regular security audits.

By addressing these challenges and limitations, Bangladesh can optimize the performance of e-GP systems, enhance their impact on government procurement practices, and ensure a secure and reliable procurement ecosystem.

VIII. Recommendations for Improvement

For making e-GP more useful in creating a Smart Bangladesh, future research and recommendations include:

1. Conducting in-depth analyses of the impact of e-GP on specific sectors, such as healthcare, education, and infrastructure, to identify sector-specific challenges and opportunities.
2. Exploring the integration of emerging technologies like artificial intelligence, blockchain, and data analytics with e-GP systems to enhance procurement intelligence, supply chain visibility, and decision-making capabilities.
3. Investigating the role of e-GP in promoting sustainable procurement practices and aligning with environmental goals, such as reducing carbon footprints and promoting green procurement initiatives.
4. Assessing the long-term socio-economic impact of e-GP adoption, including its influence on job creation, economic growth, and the development of a skilled workforce in the procurement and supply chain sectors.
5. Investing in upgrading and expanding the IT infrastructure to ensure reliable internet connectivity and power supply for seamless operation of e-GP systems.
6. Enhancing cybersecurity measures, such as implementing encryption protocols, access controls, and regular security audits, to safeguard sensitive procurement data and protect e-GP platforms from cyber threats.
7. Implementing comprehensive capacity-building and training programs for government officials, procurement officers, registered tenderers, and bankers on e-GP functionalities, procurement regulations, and best practices.
8. Enacting clear and comprehensive procurement laws, guidelines, and policies that govern e-GP processes to ensure compliance, transparency, and accountability.
9. Fostering collaboration with stakeholders and engaging with end-users to facilitate knowledge sharing, resource mobilization, co-creation of solutions, and user-centric improvements.

Continued research and exploration in these areas will provide valuable insights and guidance for Bangladesh to maximize the benefits of e-GP and drive sustainable socio-economic development through technology and innovation in public procurement.

IX. Conclusion

The implementation of e-GP systems in Bangladesh has been a significant stride towards modernizing public procurement processes. The adoption of e-GP has brought transparency, efficiency, and accountability to government transactions, aligning with the vision of building a Smart Bangladesh. By digitizing procurement workflows, e-GP has facilitated seamless tendering, enhanced supplier competition, and reduced processing times and costs. Its centralized platform enables real-time monitoring, fostering oversight and minimizing corruption risks. The impact on procurement outcomes has been profound, with substantial improvements in efficiency, cost savings, and increased bidder participation. Case studies demonstrate the system's efficacy in transforming traditional practices, setting benchmarks for digital transformation in the public sector. However, challenges persist in areas like infrastructure, capacity building, legal frameworks, and cybersecurity. Addressing these challenges through strategic investments, stakeholder collaboration, and continuous improvement will be crucial for unlocking e-GP's full potential and driving sustainable procurement. As Bangladesh progresses towards becoming a Smart Nation, e-GP will play a pivotal role in promoting digital transformation, empowering SMEs, and fostering sustainable practices. By leveraging technology and innovation, the country can enhance governance, promote economic growth, and contribute to achieving the Sustainable Development Goals. Bangladesh's e-GP journey is a testament to its commitment to leveraging technology for efficient governance and economic development, positioning the nation well to realize its vision of a Smart Bangladesh with transparency, efficiency, and sustainability at the forefront of public procurement.

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