SMART Bangladesh Vision 2041: Concept of a Sustainable Developed Country

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Abstract

A smart country or smart city is one of the key issues all over the world, some countries have projected and some are trying to be smart. In the same way, the present government of Bangladesh wants to develop the country to the stage of a developed and sustainable country through the new concept of 'Smart Bangladesh' by 2041. The recent development plan is a part of the present Bangladesh government's development agenda widely known as "Smart Bangladesh Vision 2041". This slogan has already attracted a large part of the population (mainly the young citizens) like "Digital Bangladesh". For this reason, the government has taken many inclusive initiatives combining people, government, economy, society and cities. This research paper represents the concepts and key elements or main pillars of "Smart Bangladesh Vision 2041". Besides, it shows various initiatives taken by Bangladesh government for implementing this development plan. It is imperative to have clear, concrete, and conceptual knowledge of Smart Bangladesh for all stakeholders before implementing successfully an inclusive vision.

Keywords: Smart Citizens, Smart Government, Smart Economy, Smart Society, Smart City, Digital Bangladesh, Sustainable Development

1. Introduction

'SMART Bangladesh Vision 2041' is a golden roadmap to transform the country from Digital Bangladesh to smart country by 2041 (Sarkar, 2022). To this end, specific programs have been inserted that can be implemented in the short, medium and long term in light of its four pillars of Smart Bangladesh: Smart Citizen, Smart Government, Smart Society, and Smart Economy. For this purpose, 40 megaprojects will be implemented (Sarkar, 2022). A

time-bound action plan is proposed for the implementation of each pillar. Moreover, all of these projects are essential for a sustainable economy, a sustainable society, and a sustainable environment that will transform Bangladesh into a developed country (Sarkar, 2022).

SMART Bangladesh is based on Smart Citizens, Smart Government, Smart Economy, and Smart Society including all people of Bangladesh (a2i, 2022). It aims to close the digital gap by developing and implementing sustainable digital solutions that can be used by all individuals and organizations, regardless of their socioeconomic status and size (a2i, 2022). Besides, SMART Bangladesh is the next significant step in achieving Bangabandhu's vision of *"Shonar Bangladesh"* or Golden Bangladesh, by building on the background established by Digital Bangladesh (a2i, 2022). In this context, economic activities will run through using technology, the government will be technologically smart, every people will be competent in using technology, and society will be smart (UNB, 2022). It is imperative to have conceptual knowledge for proper application of this knowledge (Yu et al., 2015; Udo-akang, 2012). Thus, concept of smart Bangladesh is crucial for actualizing SMART Bangladesh Vision 2041.

This paper aims at representing theoretical areas of Smart Bangladesh, various initiatives toward smart Bangladesh, and some related issues connecting with sustainable development. The specific objective of this study is to represent the concept of SMART Bangladesh.

2. Literature Review

2.1 Smart People/Citizens

Smart citizens/people are who use technology to interact with a Smart City environment, solve local problems and participate in decision-making (IGI Global, 2022). On the other hand, Smart Citizenship gives people the knowledge and resources they need to encourage citizen participation in data collection, analysis, and action (Smart Citizen, 2022). Citizens utilizing all the services that have been enhanced by technological, social, and cultural factors is what it means to be a smart citizen (Bayar, 2017). Thus, Lim et al. (2018) has selected five possible characters or behaviors and eight roles or job titles of smart citizens 'active', 'independent', 'aware', 'creating public values', and 'educated', and for the roles, the citizen could become leaders, champions, co-producers, entrepreneurs, proposers, human sensors, volunteers, and experts. Besides, educational level, skills, ability to network social interaction, citizens' participation in the building of the smart city, trust, and relationships are essential for being smart people (Budhai & Proag, 2015).

2.2 Smart Government

The term "Smart Government" refers to a form of government that uses information and communication technologies to improve planning and decision-making and focused on performance, data, and citizens (IGI Global, 2022). Broadly, smart government is the management of the neighborhood or civil level, the territorial or state level, the national or government level as well as the supranational and worldwide levels of governance and administration with the help of intelligently networked information and communication technologies (ICT) for the efficient and effective performance of public tasks (Lucke, 2015). Smart government incorporates six elements; the use of technology (smart ICT), smart

external collaboration and participation, smart internal administration, smart decision-making, smart administration and aspired outcomes (Bol ívar & Meijer, 2016). Smart governance is the basic concept of improving governance through the implementation of the use and exploitation of information technology integrated with the Internet (Wahyuni et al., 2022). Thus, some elements of smart government; are smart leadership and management, smart interaction, smart environment, smart services, smart technology or smart infrastructure, and smart security and safety (Zynoddini et al., 2018). Additionally, e-administration, e-participation, digital citizenship, digital business, online public services, and transparent government are also important features of smart government (Budhai & Proag, 2015).

2.3 Smart Economy

A smart economy is based on technological development, new entrepreneurial initiatives, sustainability and innovation to improve social well-being, resource efficiency, productivity and competitiveness, reducing energy and pollution to improve the quality of life for all citizens (IGI Global, 2022). The smart economy includes smart finance and payment systems that increase efficiency, transform the business environment, create viable opportunities for success, improve the inner workings of communities, and pave the way for larger, safer smart cities (The community lab, 2022). The "Smart Economy" concept combines many features of the new economy with an innovative, sustainable and eco-economic approach: productive economy, global economic growth, competition, economic development, economic prosperity, innovation, sustainable employment, and digital economy (Apostol et al., 2015). Moreover, a smart economy fosters innovation and creativity, combined with scientific research, high-tech, and environmental protection through sustainability concepts that benefit both current and future economies (Kézai et al., 2020).

Some features of a smart economy are an innovation environment, entrepreneurial tendency, economic image and trademarks, productivity, labor market flexibility, international embeddedness, and the ability to transform/change (Giffinger et al., 2007). Besides, improvement of productivity, creation of jobs, sustaining existing businesses, and creation of business and development of knowledgeable and skillful workforces for all economic sectors are elements of this economy (Budhai & Proag, 2015). Vinod Kumar & Dahiya (2017) have discussed some elements of smart economy given in the following Table 1.

Table 1. Elements of Smart of Economy

Understanding its economic DNA	Strategic investments
Driving by research and innovation	Supports and develops compelling national brand/s
Evaluating creativity and welcoming new ideas	Balanced and sustainable economic development
Enlightening entrepreneurial leadership	Excels in productivity
Offering diverse economic opportunities	The flexibility of the labor market
Economics works at the local level	Human resources that enhance its wealth
Preparing for the challenges and opportunities of economic globalization	Think local, act local, and compete globally
The sharing economy	

2.4 Smart Society/Living

In the case of discussing elements of smart cities or smart countries, most of the scholars enumerated smart living, some were careful about smart society. Objectives of smart society and smart living are all most same. Smart society provides the first extensive sociological investigation of the term smart living (Intrator, 2017). Digital technologies and methods in the Smart Society will use all available data from all industry niches and all players to provide new insights into known and future challenges such as urbanization, transportation, sustainability, resources, and health (Sensative, 2022). Digital methods and technologies in intelligent societies use all available data to create new solutions to known and future challenges related to citizens' lives and work in all parts of the country (Cities innovation center, 2022). A smart society harnesses the power and potential of technology to make people more productive allowing us to focus our resources on important activities and relationships, and ultimately, to improve health, well-being, and quality of life (Levy & Wong, 2014). Smart society strives to move toward a more citizen-centric approach to problem-solving where citizens are becoming the catalyst for a smart solution that leverages artificial intelligence and big data to break down siloes between sectors and provide new value to society, thus improving people's quality of life (Sullivan, 2019). An intelligent society is one in which digital technology is used to improve people's well-being, economic strength and institutional effectiveness (Chakravorti et al., 2017).

On the other hand, a smart society represents five traits; strong governmental institutions, innovation in public services, public well-being, personalized level of public services, and globally connected economies (Ellis, 2022). There are some features of smart society as-automated society accounting, digitalized payment gateway, digitalized gatekeeper management, easier communication, social facilities, and online economic activities (Smart Society, 2022). In the Table 2 some bases of smart society integrating people, economy and institutions.

Table 2. Benchmark of Smart Society (Chakravorti et al., 2017)

People	Economy	Institutions
-Inclusivity	-Global connectedness	-Freedoms offline and online
-Environment and quality of life	-Economic robustness	-Trust
-State of talent and the human condition	-Entrepreneurial ecosystem	- Security and safety
-Talent development	-Innovation capacity	-Public services

2.5 Smart Environment

Smart environments refer to environments where pollution is detected, predicted, classified, and resolved using intelligent tools and technologies, such as the use of Internet of Things (IoT) sensors, cloud services, and machine learning algorithms (Islam & Talukder, 2022). Thus, a smart environment is a concept of creating an environment with embedded sensors, displays, and computing devices to allow users to better understand and control their surroundings (IGI Global, 2022). The smart environment focuses on preventing the degradation of the environment, protecting natural resources, and safeguarding the related

man-made and natural infrastructure by using techniques and technologies to increase environmental sustainability (Budhai & Proag, 2015). The smart environment is one of the aspects of a smart city to develop sustainable cities in line with environmental management (Purnomo et al., 2020). A smart environment expresses the spatial dimension of smart cities that is key to climate resilience and facing natural disasters (Ateş & Erinsel Önder, 2021).

The smart environment in smart cities is the transformation of cities and the design of pure environments with elements that achieve human settlement and develop, protect and maintain a sustainable environment for a better life for the next generation (Salleh et al., 2022).

The basic elements of a smart environment are natural attractiveness, reduction of pollution, environmental protection, and sustainable resource management (Budhai & Proag, 2015). Besides, the provision of public open space, good waste management, slum area management, the revitalization of rivers, eliminating historical loss in building construction, alternative energy, reducing the production of CO_2, and urban farming are vital aspects of a smart environment (Rachmawati & Pertiwi, 2017).

2.6 Smart Mobility

Smart mobility refers to the use of various forms of transportation, such as ride-sharing, car sharing, public transport, walking and cycling that aim at reducing congestion and associated side effects such as: contamination, death, wasted time (Geotab, 2022). Similarly, smart mobility is about providing efficient local and international transportation and accessibility enhanced by the inclusion of information and communication technology in transportation systems (Giffinger, 2007). Thus, smart mobility focuses on traffic as a result of urban growth and multipolar systematic urban areas with decentralized, dispersed, and fragmented links (Alonso et al., 2016).

Some vital elements of smart mobility are variable traffic management, traffic monitoring, traffic control, public transportation app, card of public transportation, intelligent bus stops, car sharing, public bicycles, electric buses, tramways, parking sensors, parking information, NFC payment, smart logistics (Dwivedi et al., 2015). Smart mobility includes local accessibility, international accessibility, ICT infrastructure availability, and sustainable, innovative, and safe transportation systems (Budhai & Proag, 2015). Moreover, mobility as a service, shared-ride solutions, autonomous vehicles, electric vehicles, city logistics, infrastructure, public transportation, and parking services are all components of smart mobility (Nagy & Csiszár, 2020).

2.7 Smart City and Smart Country

Smart cities and smart countries are interrelated concepts. A smart city is a primary stage to be a smart country. The nation should view the first smart city initiatives as a smart nation initiative and promote the formation of smart cities to fulfil the role of a smart nation. Smart countries are a wider context of smart cities and smart cities stages are needed for transforming smart nations (Budhai & Proag, 2015). Additionally, a smart country should be defined at a higher level as a network of interconnected and integrated smart cities that improve the lives of their citizens (Tanrıöven, 2018). When all of a country's urban areas,

such as cities and towns, become smart, the entire country can be referred to as a smart country (Timinskas, 2015). In the same way, smart city Singapore would be the first smart country by 2025 (Choongjae & Youngchul, 2018).

2.8 Smart City/Country and Sustainable Development Goals (SDGs)

The goals of smart countries are derived from the concept of the sustainable development model embracing three pillars, namely: environmental, economic, and social (Budhai & Proag, 2015). The Sustainable Development Goals (SDGs), also known as the Global Goals represent a shared vision for development in the world today and the event will facilitate discussion and knowledge sharing on how they can contribute to this joint effort toward greater global sustainability (OLC, 2022; UNDP, 2023; World Bank Group, 2023). A smart and sustainable city is one that uses ICT and other means to improve quality of life, efficiency of urban processes and services, and competitiveness, while improving current and future economic, social and environmental benefits that guarantees to meet its social and cultural needs (UNECE, 2023). Smart cities not only focus on technology-based urbanization and economic sustainability but also ecological sustainability for citizens' quality of life (Tektelic Communications, 2022). Singapore's Smart Sustainable Cities initiative aims to bring together solutions from various industries to create green, digital, and efficient urban spaces, including urban solutions in areas such as: building environment and city management, urban mobility, energy, safety and security, and environment and water (EDB, 2022). Smart cities were developed to address the need for a long-term approach to developing sustainable cities, managing the city lifecycle, and improving economic performance throughout the lifecycle (Giffinger et al., 2007). Thus, smart city/country is positively interrelated with Sustainable Development Goals (SDGs).

3. Methodology

The study is based on a literature review where we have examined various national and international reports (Bhuiyan, 2010). Moreover, major websites were investigated to explore e-government applications provided by various public sector organizations (Allison et al., 2019). Website literature review is helpful for maintaining transparency, accountability and reproducibility of literature (Stansfield et al., 2016). Website review also affect literature user engagement (Garett et al., 2016). We have got help from an interpreter for translating various information from Bengali to English. Then summarizing all the relevant aspects gave an overall scenario reflecting the current status of digitalized Bangladesh and projected initiatives for Smart Bangladesh.

4. Discussion

Smart Bangladesh is the projected path toward sustainable development in all sectors. Bangladesh has changed various sectors with the touch of Digital Bangladesh Vision 2021. At present, the government is designing to transfer digital Bangladesh into Smart Bangladesh for the sustainability of its advancement. The present government has projected various endeavors to reach this destination by 2041. In its 2008 election manifesto, the Bangladesh Awami League explained the term 'Digital Bangladesh' as follows: "Vision 2021" aims to
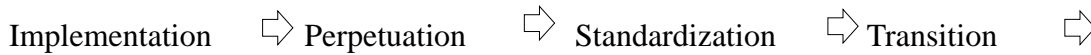
realize a technology-based modern nation by efficiently and effectively utilizing information and communication technology by 2021 in the year of 50th anniversary of independence (Mazumdar & Alharahsheh, 2020).

Over time, many criteria of Digital Bangladesh have been fulfilled. Bangladesh has tackled many challenges of the Covid-19 pandemic situation using digital technology, cell phone, and internet users have increased remarkably, people are getting financial, e-commerce, ride-sharing, and other emergency services with the help of technology, and the government has planned to introduce 5G network very soon (Rahman, 2020).

There are some hopeful scenarios of digitalized Bangladesh at present; such as 39 high-tech parks, 14 national and international cell phone companies producing 70% of our phone demands, 4,501 Union Digital Centers (UDC), 8,280 digital centers providing 300 types of public and private services, out of more than 18 cores cell phone users, some 13 cores are internet users, the annual export value of ICT sector is $1.3 billion, 6 lakh freelancers are working, installment of Bangabandhu-1 satellite, and 20 lakh jobs have been created through information technology (Bhuiyan, 2022). Additionally, in 2022, Bangladesh was ranked 88th out of 131 countries in the World Economic Forum's Networked Readiness Index (NRI) and 5th out of 233 countries in cellular data prices by UK company Cable.co.uk, according to Ookla, it ranks 141st out of 141 counties in terms of mobile internet speed and ranks 111th out of 193 UN member states in the UN-issued e-Government Development Index (EGDI) based on the three dimensions of e-government; providing online services, communication connections and human resources (Afrin, 2022). Overall, Bangladesh has progressed in some areas of Digital Bangladesh but it needs to go forward more consciously and carefully for smart Bangladesh.

Bangladesh government have taken various initiatives for implementing Smart Bangladesh Vision 2041. There are number of running and planned projects having several stages and timeline given in the following Figure 1.

Stages of Projects

Implementation ⇨ Perpetuation ⇨ Standardization ⇨ Transition ⇨

Timeline of Projects

2023 to 2025	2023-2024 to 2031	2023-2024 to 2041
Bangla Digital Skills Development, ICT Policy (Information Privacy and Cyber Security, Trade Facilitation), National Procurement E-Market, Digital Job Platform, Smart Public Service and Paperless Administration, Inclusive Financial Resources, Government Cloud, and Data Center.	Universal Digital ID, Digital Curriculum, Smart Device Access, Digital Collaboration Platform, Smart Bangla Campaign, Smart Healthcare, Smart Tax, Blended Learning, Digital Leadership Academy.	Smart Land Management, Smart Postal Service, Smart Judiciary, Smart Borders, Smart Social Safety Net, Police Modernization, Inclusive Financial Ecosystem, FinTech Accelerator, Center of Excellence (COE) for Emerging Technologies.

Smart Bangladesh 2041

Figure 1. Smart Bangladesh: Vision and Reality (Sarkar, 2022)

4.1 Smart Citizens and Smart Government

Bangladesh government have taken some endeavors in smart citizens and smart government. Initially, Digital Service Design Lab (Accelerating the Digitization of Govt. Services) visualizes and analyzes manual services end-to-end and simplifies them by eliminating the redundant steps required for citizens, designing a simplified digitalization of services, preparing budgets and implementing plans, and coordinating officials, the public, local technology of companies and international experts (a2i, 2022). Secondly, MyGov (One Platform, Multiple Solutions) not only consolidates all ministries' digital services into one app, but also provides a single app that includes all additional services such as online payment, benefit application, benefits information, complete benefit application, and benefit availability (a2i, 2022). It also helps users without internet access to obtain information and request services and can be used to find the nearest digital center (a2i, 2022). Thirdly, the automation, artificial intelligence, and shift to a circular economy of 4IR have created jobless problems acutely. For facing 4IR challenges Bangladesh government has developed five building blocks; Real-time, forecasts, experimentation and adaptation, opportunities, and policy (a2i, 2022). Fourthly, Innovation lab (iLab) will catalyze the advancement and commercialization of homegrown devices, advances, and solutions in five ways (a2i, 2022). Such as-

➲ All line ministries will embrace experimentation with at least one project related to 4lR (new technology, re-skilling/upskilling) which can be evaluated for scale-up.

➲ Give 4IR coordinating fund/innovation support for prototyping.

➲ Coordinate to show off the 4IR projects/initiatives/prototypes coming around from the tests.

➲ Ministries and affiliations related to skills and employment will be onboarded for reskilling and upskilling. The Bangladesh Technical Education Board (BTEB) will take the lead to create 4IR-based educational modules.

➲ 4IR-based soft skills will be included in all levels of education by the National Curriculum and Textbook Board (NCTB) with back from a2i.

All of these programs have been taken for increasing government administrative ability, service quality, and people's skills in technology that are vital to Smart Bangladesh.

4.2 Smart Economy and Smart Society

There are some initiatives for implementing smart economy and smart society elements of smart Bangladesh. Firstly, ekShop (Digital Livelihoods for the Youth and Refugees) will help rural youth, artisans, and farmers in the following ways (a2i, 2022). Such as-

➲ Reach new urban customers directly, avoiding multiple layers of traditional and expensive intermediaries;

➲ Get a "fair price" for your products;

➲ Open virtual shops to showcase and offer their items online;

➲ Get help from Advanced Middle Business visionaries on promotion and advancement;

➲ Interface and arrange cheaper costs with coordination's accomplices; and receive and make payments digitally.

Secondly, iLab (Incubating and Scaling-up Social Innovations) incubates and quickens advancements to handle a few of the foremost squeezing societal and environmental issues that Bangladesh faces nowadays by leveraging innovation; especially, electro-mechanical gadgets, the Internet of Things (IOT), and renewable energy (a2i, 2022). Bangladesh is giving priority to innovation for a smart society. Thirdly, Digital transformation of Bangladesh's Cottage, Micro, Small, and Medium Enterprises (CMSME) covers identity (Digital identity for every CMSME), linked transaction history (The previous transaction of CMSME can be collected and analyzed by using various apps), credit worthiness criteria (obtaining electronically and eKYC and linked transaction history), awareness and skills (digitalization of CMSME through training and development programs), safety framework (safety frameworks for data privacy, the risk of digital identity theft, and other related issues), partnership framework (collaborative effort among the bank, MFS or Mobile Financial service, and Application Programming Interfaces or APIs for signing multiple memorandums of understanding (MoUs).

Table 3. Initiatives toward Smart Bangladesh (a2i Bangladesh, 2022)

Initiatives	Functional areas-
Internet access to last-mile citizens	Accessible, reliable, and affordable internet facilities to all citizens
Smart traffic system	Will track roads using artificial intelligence (AI) and data management, and install electrical vehicles with a computer-based system for connecting with others vehicles.
Smart health care	Data will be automatically generated by setting up the chip in the human body and sent to the doctor, and smart health records of patients will be kept for proper treatment.
Smart agriculture	Satellites, microsensors, and mobile phones will be used collectively for proper decisions in irrigation, fertilizer use, and harvesting by farmers and agriculture officers.
Smart education framework	Will focus 5 topics; Teaching-learning practices, content and resources, formative assessment, teacher professional development, and inclusive infrastructure incorporating blended learning.
Waste management in Bangladesh	Waste's place will be identified using image detection technology developing related policy and legal frameworks.
Govpreneurship	Focus on four areas; the purpose of civil service for reducing TCV (Time, Cost, and Visit), autonomy, increasing Competency, and collaboration.
SMART Village Transport	An electric vehicle having low-cost, and eco-friendly smart grid electric charging stations in the city and village.
BCC (Behavior Change Communication)	Change the psychology of citizens for increasing efficiency.
Smart service delivery	Prioritize on S-M-A-R-T where S stands for social to co-create services with citizens and civil society, M for the mobility of services, A for analytics of various departments of government, R for radical opens of government services, and T for trust in cyber security for ensuring security and privacy and protecting data leakage.

5. Conclusion

'SMART Bangladesh Vision 2041' is a transformation not only to a high-income economic country by 2041 but also to a position of an equitable, sustainable, developed country with Smart Citizens, Smart Government, Smart Economy, and Smart Society. This is very much in line with the Sustainable Development Goals put forward by the United Nations and meet up 4th industrial revolution challenges. On this context, Bangladesh government have taken various initiatives for actualization of this vision incorporating various technological mechanisms. It is imperative to have strong conceptual knowledge on Smart Bangladesh before implementing various endeavors toward this vision 2041. Theoretical notion of smart citizens, smart economy, smart society and smart government will be helpful for planning, organizing, executing and following up numerous projects to being sustainable smart country.

The paper helps readers, policymakers, and the general public to get an overview and depth knowledge of Smart Bangladesh. It also represents various initiatives taken by the government toward a smart country. This research is not out of pitfalls. Firstly, there was reviewed limited literature. Secondly, our paper only focuses on conceptual areas of the smart country. Finally, the amount of numerical data and statistics may not be satisfactory. Further research with a big portion of this concept including qualitative and quantitative approaches can enhance reliability and validity.

Acknowledgment

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