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RESEARCH ARTICLE

Gravitating towards the Digital Economy: Opportunities and Challenges for Transforming Smart Bangladesh

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ARTICLE INFO	ABSTRACT
	The digital economy encompasses the economic activities that arise from the interconnection of persons, businesses, devices, data, and processes through digital technology. The primary objective of the research is to provide an efficient and adaptable legal, financial, and institutional structure to promote competitiveness while mitigating the adverse effects of the digital revolution on society. This study article focuses on the application of qualitative techniques. The secondary data was used to create a comprehensive study that tries to accurately represent the current situation of the digital economy in Bangladesh. Several publications were gathered to facilitate the execution of this research. A total of approximately 100 papers were gathered for the purpose of conducting this research. Out of these, a subset of 51 articles were selected and utilized to align with the specific research objectives. One of the greatest opportunities of the digital economy is its capacity to engage with a worldwide audience, enhance efficiency and productivity, foster innovation, and provide personalization. The primary obstacles faced by the digital economy include the establishment of intricate and ever-changing 'cross-border production networks due to globalization, concerns regarding security, the need for digital inclusion, and the presence of legislative barriers. The digitalization of the economy has the potential to impact the structure of the global value chain by lowering costs and offering enterprise services at more affordable prices. The digital economy is constrained by the finite number of bits it can use to represent data, resulting in a restricted resolution of the data. Global activities are hindered by inconsistencies in regulations and the complexity of taxation. Economic displacement arises when automation supplants employment, leading to a rise in inequality.

INTRODUCTION

Digital economy refers to the vast network of interconnected organisations, devices, individuals, data, and processes that are involved in various economic activities (Bhuiyan & Akter, 2024). This network consists of billions of regular online links that facilitate the flow of information and transactions. Hyper connectivity refers to the phenomenon of enhanced interconnectivity among various entities such as organisations, individuals, and machines. This is achieved through the utilisation of the Internet, the Internet of Things (IoT), and mobile technologies. It serves as the fundamental basis for the digital economy, as highlighted by Nguyen (2023). Within the current era, researchers find themselves immersed in a technologically advanced society where the mere possession of a smartphone, access to the Internet, and a rudimentary understanding of smartphone

functionality are sufficient prerequisites for successfully marketing a product. According to Guariso and Nyqvist (2018), empirical evidence from industrialised nations suggests that there is a positive relationship between the ease of accessing information and both productivity and efficiency.

Bangladesh, like many other countries, has witnessed a significant digital transformation in recent years (Rahman et al., 2024). The digital revolution has had a profound impact on various aspects of human life, including communication, business practices, and information gathering (Gui & Gerosa, 2018). The impact of the digital revolution on our economic and social lives is believed to have exceeded that of all previous revolutions (Hossain et al., 2024). It is worth noting that researchers are presently residing in the era commonly referred to as the digital age. The Internet has evolved into a vital element of corporate management, starting from its early stage as a potentially cost-effective communication channel (Poli et al., 2024). According to Korotkevich (2019), technological advancement has been found to significantly benefit the economy and people of any nations.

The industry will not be limited to a singular urban centre or country, but rather it will be globally interconnected, enabling individuals to engage in employment opportunities with organisations located in any part of the world. Observations of the current state of a developing country such as Bangladesh, two decades after the initial projections, reveal discernible transformations. Over the past decade, there has been a noteworthy expansion in the information and communications sector, which has empowered the country to make substantial contributions to the digital economy in Bangladesh. It has been observed that policymakers and the country's workforce exhibit a significant level of interest in the Information and Communication Technology (ICT) industry (Clemons, 2007).

According to Sellar (2019), the adoption of a new technology can result in a temporary period of unemployment. However, it also has the potential to rapidly create new job opportunities. Considering the rapid pace of technological advancements (Bhuiyan et al., 2023), it is evident that the adoption of feasible technologies can greatly contribute to the robust expansion of any nation's economy. In the pursuit of identifying a sustainable development strategy, affluent nations are presently placing emphasis on technological advancements such as 3D printing or biofuel engineering (Shor et al., 2022). According to Kotevski and Milenkoski (2018), neighbouring countries such as India have effectively implemented various technological advancements. These include the digitization of bus and rail systems, online banking capabilities, Internet marketing services, e-learning initiatives, and long distance contact center services (Bhuiyan, 2019).

Research Gaps

Due to the notable degree of mobility, it is anticipated that the employment rate within these sectors will experience a substantial rise in contrast to industries such as manufacturing or agriculture (Akter et al., 2023). Nevertheless, it is worth noting that there has been a scarcity of research-based articles pertaining to the digital economy in developed countries, as highlighted by Feng et al. (2022). However, there is a limited amount of scholarly articles and publications available that specifically address the current and future state of the digital economy (Islam et al., 2024).

Digitization, specifically in the areas of digital payments and electronic delivery of public services, has undeniably played a crucial role in promoting equality (Mani, 2019). However, it is important to acknowledge that certain sectors of the Bangladesh economy still lag behind and face exclusion, indicating a need for further development. The authors Rizal and Pakkanna (2023) propose that the adoption and development of a digital economy in Bangladesh could potentially propel the country towards attaining high-income status by the year 2041 (Bhuiyan et al., 2023).

Objectives

RO 1. To determine the present status of digital economy in a developing economy.

RO 2: To identify the opportunities of digital economy in Bangladesh.

RO 3: To determine the challenges of digital economy in Bangladesh.

Literature Review

The acceptance and integration of Information and Communication Technology (ICT) across all business sectors is crucial for enhancing productivity and forms the fundamental basis of the digital economy (Islam & Bhuiyan, 2022). The digital transformation of the economy is challenging conventional wisdom on various aspects such as the formation of business, consumer behaviour in obtaining products, services, and information, and the adaptation of regulatory frameworks by states to address emerging problems. The term "digital economy" refers to an economic system in which various economic activities are conducted by utilising digital computing technologies (Islam & Bhuiyan, 2022).

Perspective areas of digital economy

The advent of the digital revolution has brought about a new phase of economic expansion and advancement, altering the ways in which we perform business, obtain services, and engage with society (Sidorova, 2016). The transition to a digital economy offers an exceptional chance for a country like Bangladesh whose populace is youthful and adept at using technology. Bangladesh may bridge existing gaps, open up fresh opportunities for economic expansion, and raise the standard of living for its people by utilizing innovation and technology.

Table 1: Evolution of Digital Economy

Key concerns of consideration	Description	Reference
The emergence of digital trade and e-commerce	Digital trade encompasses a wide range of activities including, online shopping, electronic payments, and e-commerce across borders. It involves the purchasing and selling of products and services over digital platforms. The transformation has been propelled by progress in internet connectivity, mobile technology, and electronic payment systems. Online marketplaces like Amazon, Alibaba, and eBay have revolutionized the process of purchasing and selling goods on the internet. These platforms have not only changed the retail industry but also introduced innovative technologies and business models.	(Meng, 2022).
Rising remote work uptake	The growing prevalence of remote work has played a pivotal role in diving in driving the revolution of the digital economy, leading to substantial changes in how businesses operate and employ workers. The implementation of this shift has improved productivity and efficiency by enabling people to work in environment that align with their preferences, facilitated by sophisticated digital tools and platforms. Businesses experience reduced expenses on workspace and utilities, while people have time and financial savings on commuting, leading to an improved life at work.	(Kabanda, 2021).
Artificial intelligence (AI) and automation	The convergence of artificial intelligence (AI) and automation is significantly expanding the revolution of the digital economy, transforming industries and altering the essence of employment. Artificial intelligence (AI) and automation improve	(Osiyevskyy et al., 2020).

	productivity by executing jobs with more efficiency and precision compared to humans. This enables organizations to optimize their operations and minimize expenses. These innovations facilitate sophisticated data analysis, offering valuable insights that stimulate innovation and influence decisions regarding strategy.	
Digital payments and cryptocurrencies	Digital payments and cryptocurrencies, are leading the way in the revolution of the digital economy, fundamentally changing financial exchanges to monetary relationships. The extensive implementation of digital payment platforms has accelerated transactions, enhanced convenience, and improved accessibility, hence diminishing dependence on cash and conventional banking institutions. This move promotes financial inclusions, allowing marginalized population to actively engage in the digital economy. Cryptocurrencies because to their decentralized structure, provide an alternative to traditional financial systems, promoting the development of innovative services and goods related to finance.	(Malherbe & Montalban, 2022).

METHODOLOGY

The primary focus of this research paper revolved around the utilisation of qualitative methodologies. The preparation of the paper on the prospective sectors of the digital economy in Bangladesh involved the adoption of a methodological approach (Meah & Hossain, 2023). From a Bangladeshi perspective, it is currently not feasible to collect primary data due to the emergence of sectors in the digital economy (Akter et al., 2023). Therefore, in this study, secondary data was utilised to compile a comprehensive report that aims to depict the present state of the digital economy in Bangladesh (Bhuiyan et al., 2024). A total of approximately 100 papers were gathered for the purpose of conducting this research. Out of these, a subset of 51 articles were selected and utilised to align with the specific research objectives (Molla et al., 2023). Furthermore, the data were obtained from a variety of sources including newspapers, student papers, the Internet, company websites, government statistics, market research reports, published journals, and other online sources (Bhuiyan, 2023).
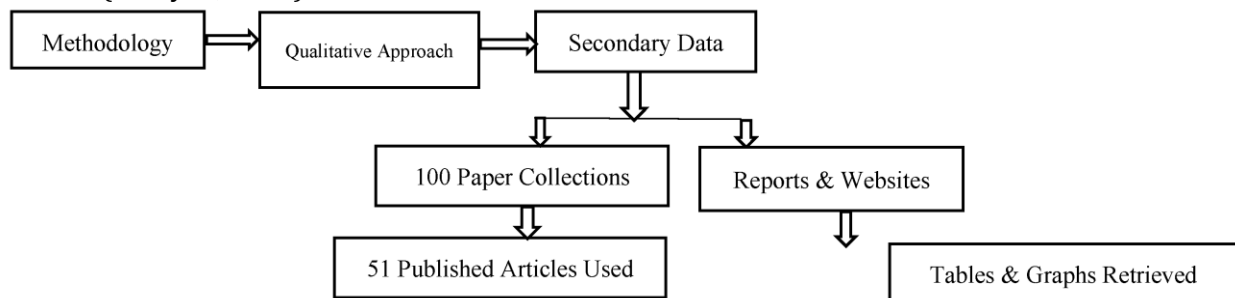
Figure 1: Research Methodology
Source: Author's Work

The majority of the articles included in this study were sourced from various indexing databases, including Scopus, Web of Science, Science Direct, Scimago, DOAJ, and other indexed journals. The articles selected for this study were obtained from the most recent publications available, spanning

from 2020 to 2024 (Bhuiyan, 2024). Given the novelty and emergence of this topic in the field of research, the establishment of standardized criteria for article selection poses a significant challenge (Masum et al., 2024). The study was conducted by the researchers using content matching as the basis, focusing on topics such as the digital economy, ICT usages, and the Fourth Industrial Revolution (4IR) to search for relevant articles. The tables and graphs utilised in this study were obtained from various reputable sources, including the Bangladesh Bank, BTCL, and Oxford Internet Institute. These sources were selected due to their relevance and expertise in the field of the digital economy of Bangladesh.
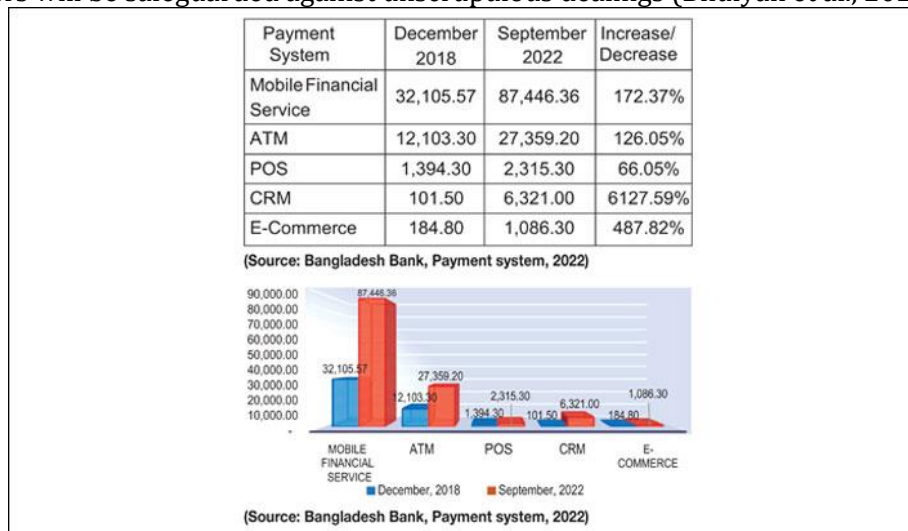
DISCUSSION

Opportunities of Digital Economy

Improved Productivity & Efficiency

Productivity and efficiency are both increased as a result of the digital economy (Chen & Wu, 2024). Traditional company procedures frequently encompass the completion of laborious paperwork, the maintenance of records manually, and the use of lengthy approval procedures (Abbey & Richards, 2018). By digitizing these processes, businesses are able to improve the efficiency of their operations, in addition to lowering their costs and providing better service to their customers. It is possible that Bangladeshi goods and services may become more competitive on the international market as a result of this greater efficiency, which will in turn attract foreign investments and increase exports (Bhuiyan, 2017).

E-commerce on Economic Growth

In the context of the digital economy, e-commerce is an excellent illustration of how they may stimulate growth (Dong & Jia, 2022). A remarkable increase in the use of digital payment methods and online purchasing has been observed in Bangladesh during the past few years. Not only has the convenience of buying online revolutionized the retail industry, but it has also opened up chances for independent entrepreneurs and small enterprises to expand their customer base (Le-Hoang, 2020). Nevertheless, it is of the utmost importance to guarantee that this expansion will be sustainable and that customers will be safeguarded against unscrupulous dealings (Bhuiyan et al., 2023).

Payment System	December 2018	September 2022	Increase/ Decrease
Mobile Financial Service	32,105.57	87,446.36	172.37%
ATM	12,103.30	27,359.20	126.05%
POS	1,394.30	2,315.30	66.05%
CRM	101.50	6,321.00	6127.59%
E-Commerce	184.80	1,086.30	487.82%

(Source: Bangladesh Bank, Payment system, 2022)

(Source: Bangladesh Bank, Payment system, 2022)

Figure 2: Payment System of Bangladesh
Source: Bangladesh Bank, Payment System, 2022.

Fintech Innovations & Digital Payments

The advent of fintech has enhanced the accessibility of financial services to a wider audience (Burke, 2021). The widespread adoption of mobile banking and digital wallets has facilitated financial inclusion on an unprecedented level, offering a vital resource to individuals who were previously unable to access traditional banking services. The transition to cashless transactions has also been

crucial in diminishing corruption and guaranteeing openness. The number of transactions through cards increased by 6%, mobile banking by 29%, and internet banking by 22% in 2022 year-on-year.
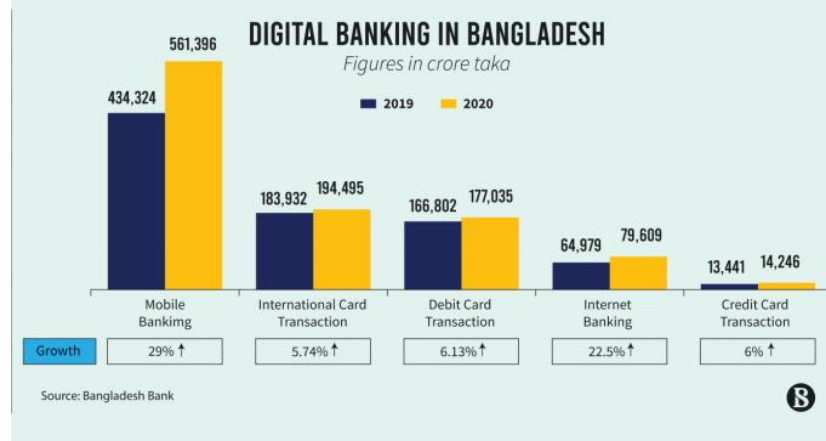
Figure 3: Digital Banking in Bangladesh
Source: Bangladesh Bank

Digital Infrastructure
The COVID-19 pandemic has highlighted the significance of a strong and resilient digital infrastructure. The internet ecosystem has provided crucial support during these difficult times, enabling remote jobs and online education (Sümer & Yüner, 2021). Continuing to invest in digital infrastructure is crucial for ensuring resilience in the face of future disasters.

Economic Expansion
The digital economy has the capacity to significantly change many industries, improve productivity, and generate fresh prospects for innovation and entrepreneurship (Kusumawardhani & Purnamasari, 2019). By adopting digital technology, Bangladesh may optimize business operations, enhance service delivery, and broaden market reach for small and medium-sized firms (SMEs). E-commerce, fintech and digital services, are becoming increasingly important factors in promoting economic growth, as they offer new sources of income and jobs prospects (Adugna, 2023). In addition, digital platforms have the potential to increase governance, promote transparency, and optimize the efficiency of public services.

The change can be accelerated by investing in digital infrastructure, together with implementing policies that encourage digital literacy and innovation. Bangladesh's ongoing integration of digital technologies into its economic framework enables it to effectively compete on a global scale, attract foreign investment, and achieve inclusive growth that benefits all sectors of society (Saha et al., 2024). The implementation of this growth strategy, which focuses on digital technologies, is crucial for achieving the vision of a wealthy and technologically advanced "Smart Bangladesh."

Innovation & Entrepreneurship
The foundation of creating a "Smart Bangladesh" in the rapidly expanding digital economy is innovation and entrepreneurship (Faghih, 2024). The quick development of digital technology gives entrepreneurs a great opportunity to create novel solutions that solve regional problems and open up international markets. Emerging as key actors, startups in industries including finance, e-commerce, health tech, and edtech are propelling economic growth and employment creation (Undheim, 2021). Tech hubs, incubators, and accelerators have been established as a result of the public and private sectors' growing recognition of the value of supporting an entrepreneurial environment. Through these efforts, aspiring business owners can get the tools, finance, and guidance they need to turn their ideas into successful companies. In addition, the widespread adoption of digital platforms makes it simpler to reach markets, lowers operating expenses, and improves the scalability of enterprises.

Social Inclusion

Bangladesh can ensure equitable access to education, employment, and entrepreneurship for many populations, including women, rural communities, and marginalized groups, by closing the digital divide (Islam et al., 2024). Digital platforms and e-services have the potential to improve access to vital services like healthcare, education, and financial services, leading to better quality of life and economic opportunities for underprivileged people (Santoro et al., 2022). Government activities focused on fostering digital literacy and ensuring cheap internet access are essential for allowing individuals to actively engage in the digital economy. The implementation of inclusive policies those facilitate digital skills training and entrepreneurship for those with disadvantages can become and balanced economic expansion.

CHALLENGES OF DIGITAL ECONOMY

Cybersecurity Threats

While we acknowledge and appreciate these accomplishments, it is important to acknowledge that there are still tasks that need to be completed. Ensuring cybersecurity is of utmost importance, necessitating the implementation of strong measures to safeguard personal, corporate, and governmental data from cyber risks (Balatska & Opirskyy, 2023). In order to guarantee the safe and efficient navigation of the digital realm by all individuals, it is imperative to broaden the scope of digital literacy initiatives (Amin et al., 2024).

Digital Literacy

A large segment of the population lacks the digital skills to properly engage in and benefit from the digital economy, despite significant technological improvements and internet adoption (Zhu, 2023). In rural places, where education and internet resources are few, the digital gap is worse. Digital literacy is difficult to teach in the antiquated and underfunded school system. Additionally, trained educators who can teach these abilities are scarce (Bhuiyan et al., 2024). Economic hurdles also hinder digital learning since many cannot afford the gear or internet connectivity needed. Gender differences in digital literacy hamper women's digital economy involvement, worsening social inequality (Throndsen & Hatlevik, 2016). Bangladesh must integrate government, business sector, and civil society initiatives to increase access, education, and infrastructure to maximize the digital economy (Saha et al., 2024).

Deficiency in Infrastructure

Considering recent advancements, transportation, electricity, and telecommunications still fall short of an increasing population and economy. Poor roads and bridges in rural areas slow goods and people mobility. Power outages and unpredictable electricity reduce industrial productivity and foreign investment (Bhuiyan et al., 2024). Though developing, the telecommunications infrastructure is insufficient to promote digital inclusion and connection, especially in remote areas (Terzoli et al., 2018). Congestion, insufficient public transportation, and bad water and sanitation also plague cities (Alam et al., 2022). This infrastructural deficiency hinders economic prospects and quality of life for millions of Bangladeshis. Building robust and sustainable infrastructure to achieve Bangladesh's long-term development aspirations requires significant investment and strategic planning from the public and private sectors.

CONCLUSIONS

The current state of the digital economy is characterised by emerging trends that are contributing to the national GDP as part of the adjustment process for the 4th Industrial Revolution, with the ultimate goal of transforming Bangladesh into a smart nation (Islam et al., 2024). Based on the results of the study, it is anticipated that the digital economy will expand its potential for commercial and business opportunities. The study is subject to special limitations, primarily due to its reliance on secondary data sources (Amin et al., 2024). When the study is conducted using primary data, it has the potential to influence the outcome and findings of the digital economy. In the future, researchers will focus on eliminating less significant areas of the digital economy in order to obtain more accurate information (Mia et al., 2024).

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