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Blockchain Technology in Bangladesh's FMCG Sector: A Review

Zerin Tasnim[1*] Dr. Abu Bakar A. Hamid[2] Dr. Devika Nadarajah[3]
1. Putra Business School, University Putra Malaysia (UPM)
2. Professor, Infrastructure University Kuala Lumpur(IUKL)
3. Associate Professor, Putra Business School, UPM, Malaysia
* E-mail of the corresponding author: zerinarna03@gmail.com

Abstract
The effectiveness of a company's supply chain is influenced by responsiveness, flexibility, quality, cost, and managerial support. However, businesses that run manually are unable to maintain an effective supply chain process due to fraud, subpar quality, longer lead times, a lack of flexibility, a lack of response, monitoring problems, and a lack of coordination among members. These difficulties can be solved using blockchain, which will improve consumer views. Bangladesh has a huge market for fast-moving consumer products, and that market is expanding quickly. By delivering real-time data, reducing operational expenses, addressing the tracking issue, assuring secure transactions, enhancing communication, and increasing flexibility, the adoption of blockchain can change how these businesses work in their supply chains. Despite the enormous interest, there is currently very little research on blockchain adoption in the context of emerging economy countries. That's why the current study highlights blockchain adoption in Bangladesh's FMCG context.
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1. Introduction

The supply chain (SC) is a network of interconnected processes that includes product creation, production, shipping, distribution, and information systems. All SC silos must continue to coordinate and communicate in order to improve the supply chain performance (SCP) (Nandi et al., 2020; Rejeb et al., 2020; Reza, 2020). The efficacy and efficiency of the SC process and SC network are governed by a set of characteristics known as supply chain performance. The client's perspective, supplier commitment, flexibility, quality, responsiveness, supply chain expenditure, management commitment, and product qualities are just a few of the factors that affect SCP (Jafari et al., 2021). Manual supply chain operations incur the risk of longer product delivery times, fraud, and counterfeiting, and these risks are continuously growing, which has an influence on customer demand (Takahashi, 2018). A constant flow through the network has also been maintained by traditional supply chain management systems using centralized management systems like enterprise resource planning (ERP). Security, fraud, and errors were a few issues that the centralized system had in the past, but (Paul et al., 2021). Consequently, it is necessary to redesign the entire process by implementing digital technology (Kinkel et al.,2022). Yiu et al. (2020) assert that information technology (IT) has a favorable influence on supply chain performance (SCP). Industry 4.0 (IR 4.0), which is the fourth industrial revolution and consists mostly of digital technologies, is an unheard-of technology in this context (Srhir et al., 2023).

Blockchain technology (BCT) is the most publicized IR 4.0 technology and has the most potential to develop a novel business model (Javaid et al., 2021). One solution that can offer a common IT framework to sustain efficient information flows and processes among all SC partners is blockchain technology (BCT). Immutability, traceability, security, integrity, and simple data retrieval are all benefits of the distributed ledger technology used by BCT (Khan et al., 2022). This kind of solution fosters confidence between all authorized parties and guarantees a secure and safe data exchange (Cao et al., 2023). Traditional supply chains are currently experiencing a number of issues with accountability, transparency, and product traceability (Sunmola and Burgess, 2023). Among the six megatrends, blockchain is seen as shaping up SC processes (Kamble et al., 2020). Lately, traditional supply chains have gone through various problems regarding transparency, product traceability, and accountability (Sunmola and Burgess, 2023). blockchain is considered one of the six megatrends that are going to shape up and can bring huge improvements to SC processes (Kamble et al., 2020).

Digitalization may help with a number of objectives, such as improving information flow, reducing market risks, and reducing dependency on various supply chain management players. An operation may be made visible, traceable, dependable, and secure by employing blockchain technology. Additionally, blockchain technology can promote collaboration among all involved in the supply chain, increasing the SC's efficacy and efficiency (Sharma et al., 2023). However, the use of BCT in SC procedures is still relatively new. There are not many instances of BCT adoption in the SC that highlight its benefits. As a result, to integrate all supply chain-related information, academics, practitioners, and the government are focusing on this technology (Chand et al., 2021). Many SCM processes experience significant interruptions during the Covid-19 epidemic as a result of the worldwide

lockdowns that have forced certain systems to adapt in order to survive. By offering customers, business partners, and other stakeholders safe, transparent, and trustworthy data, BCT can completely transform the process. As a result, the need for BCT is progressively increasing to create a robust supply chain management process across various sectors (Guan et al., 2023). BCT has been used in a variety of industries, such as the food, toiletry, and pharmaceutical sectors, to improve overall performance and spot any fraud or manipulation (Burkhalter, 2020).

2. Supply chain management in the Bangladesh FMCG Sector

Bangladesh has been engaged in SCM-related activities for years. However, the application is still in its early stages in Bangladesh's various industries (Uddin and Akhter, 2019). For this nation, obtaining raw resources and maintaining good cooperation among SC partners is particularly difficult. Additionally, practically all domestic FMCG firms in Bangladesh operate their SCM process manually, which leads to a number of safety challenges, such as controversies involving contaminated dairy products and subpar components in packaged goods and medications. Additionally, individual pharmacies have control over Bangladesh's drug distribution business, which provides several opportunities to offer subpar medications for more money. However, given the current state of globalization, it is essential to identify the main causes of SC as well as the influence of digitization (Uddin, 2020b).

Large pharmaceutical companies in Bangladesh experienced significant supply chain disruptions during the pandemic situation COVID-19 due to a lack of resources (Ovi and Mahmud, 2019). As a result, the importer countries have begun to recognize the importance of diverse sourcing (https://www.thefinancialexpress.com.bd). Due to labor and logistical limitations, the food supply chain and other consumer items also had difficulties during the pandemic conditions, similar to the pharmaceutical industry (https://oxfordbusinessgroup.com). Large FMCG companies in this nation, including Meghna Group, City Group, Bashundhara Group, Akij Group, and Beximco Pharmaceuticals, experienced significant SC disruption as a result of a lack of raw materials, a labor shortage at the manufacturing site, and a lack of logistical support (Pantho, 2020).

The increased speed and lower expenses of such a system are advantages. Additionally, because all stakeholders have access to all data, decision-making is made simpler and takes less time because of the availability of real-time data (Ahmed, 2018). To improve the efficiency of their supply chains, many businesses in Bangladesh, including the ready-made garments (RMG) industry, a number of pharmaceutical firms, and a number of food companies, have already used blockchain technology. Still, many businesses in Bangladesh are using this technology for the first time (Rahman and Yadlapalli, 2020). Additionally, there may be several inter-organizational, technical, and outside obstacles to BCT implementation in Bangladesh's FMCG sector (Haque et al., 2022). In Bangladesh, where blockchain technology is still in its infancy, there is a shortage of competent labor. and a technical specialist is required if an issue develops (Hasan et al., 2022). The performance of Bangladeshi FMCG businesses' supply chains may be considerably impacted by BCT adoption, despite its many hurdles.

3. Fast-Moving Consumer Goods (FMCG) Sector in Bangladesh

Bangladesh's FMCG industry is able to satisfy both domestic and international customer demand. The country's expenditure on FMCG consumption has increased over the past 15 years in both urban and rural regions, and the demand is moving from urban to rural areas. Because the majority of Bangladesh's land is rural, FMCG businesses are increasingly offering novel items in tiny sachets to draw low-income consumers from rural regions in addition to concentrating on urban consumers. In Bangladesh, FMCG industries include food and beverage products like biscuits, soft drinks, dairy products, frozen foods, juices, coffee, etc.; personal care products like toiletries, cosmetics, and other related items; household products like all types of cleaning supplies; over-the-counter medications, footwear, consumer safety, eyewear, personal products, pet care, toys (Hossain et al., 2020).

The fast-moving consumer goods (FMCG) industry has been one of the primary sectors serving domestic customers in Bangladesh. The nation's expanding middle class and improving standard of living have been key factors in the industry's growth. Compared to luxury goods and other commodities, the FMCG business has remained fairly steady, with food and drink, personal care, and household care acting as the sector's cornerstones of development. Due to effective infrastructure assistance, the company has been able to swiftly increase its last-mile logistics and has built complicated distribution networks throughout the nation supporting SME-level businesses. E-commerce and the quickly growing contemporary trade sector have given the industry new growth prospects. The FMCG industry is now led by BATB, which manages tobacco goods, with Unilever, PRAN, and Square completing the top five (Kibria, 2020).

Bangladesh's FMCG industry is tremendously successful since consumers across all social groups routinely buy FMCG goods. Additionally, this industry benefits from cheap operating costs, a sizable consumer base, and effective distribution networks (Hossain et al., 2020). The Bangladesh Bureau of Statistics (BBS) reports that in 2012, 79% of the average monthly family income was spent on consumption in urban areas, 79% in 2005, and 74% in 2000. This rate was 96% nationally in 2010, 83% in 2005, and 78% in 2000. That indicates that both urban and rural regions have seen a large increase in expenditure. Additionally, the food and beverage industries accounted for the majority of spending (Uddin, 2020a).

As the government places greater emphasis on constructing roads and highways, this industry develops a network of small and medium-sized retail stores across the whole nation. By 2025, it is anticipated that the market for this business would be worth $1.54 trillion. In the FMCG sector, BATB now leads the tobacco category, followed by Unilever, PRAN, Square, Beximco, and Akij Group (Kibria, 2020). FMCG items are sold rapidly and for a fair amount since they have a short shelf life. Examples of FMCG items include foods, beverages, toiletries, over-the-counter pharmaceuticals, and other consumables that are connected. The nation's FMCG industry has benefited from middle-class contributions. According to Boston Consulting Group, 20 lakh Bangladeshis join the middle and affluent class (MAC) per year. 20 percent of Bangladesh's population and 24,1 percent of Indians, respectively, are estimated by the Bangladesh Institute of Development Studies (BIDS) to be middle-class income earners. In the years 2025 and 2030, it is expected that 25% and 33% of the total population would belong to the middle class.

The growth in rural consumption is a significant component in the development of Bangladesh's FMCG industry. According to BBS, during the past 15 years, consumption expenditure in rural regions increased from 81% to 103%. Major conglomerates and more than thirty businesses have joined the FMCG sector in an effort to take advantage of the expanding opportunity. Global players joined the local market after 2000, including Square Group, Bashundhara Group, IFAD, ACME, Golden Harvest, Aftab, and Globe (Business Insider Bangladesh, 2022).

FMCG items generate $18.42 billion in annual revenue in Bangladesh. Over 100 million financial transactions per day come from the 1.3 million retail stores (mudir dokans). By 2025, Bangladesh will have about 34 million members of the Middle and Affluent Class (MAC). In 2022, sales of FMCG items totaled $3.9 billion, or Tk 37,000 crore (Tk 95 for a dollar), in local currency. In such a scenario, the FMCG industry has a significant potential to contribute to the country's GDP growth, which may be further increased by embracing digitization. Digital platforms will boost the overall supply chain network's operational effectiveness, including FMCG enterprises. The background of Bangladesh's adoption of digitalization in supply chain activities, however, is less well supported by data. Therefore, additional study is needed to determine how digitalization affects FMCG supply chain processes. All FMCG firms will implement digitalization over the next three to five years, and they will work together to create a national ecosystem growth push. To face new disruptions and build a robust supply chain process in the post-COVID-19 paradigm, the supply chain will need to undergo digital transformation (Sarwar et al., 2021).

The Covid-19 epidemic caused a global lockdown that disproportionately affected Bangladesh's FMCG industry for several reasons. Despite a brief, sharp increase in demand for commodities like food, the industry is not set up to accommodate such an artificial rise in demand. Most department retailers and superstores are alleging supply shortages as a result. The majority of businesses will find it challenging to get raw materials due to interruptions to the global supply chains; this might lead to a shortage of products and an increase in costs. The effects of coronavirus are also considerably clearer at the distribution end. The bulk of FMCG firms supplies completed items to retail venues through third-party distributors and Sales Representatives (SRs). Businesses have not yet cut their distribution field employees in order to curb the virus's spread. Most companies are still operating in full distribution mode, which might endanger lives through local transmission (Kibria, 2020).

The FMCG business has seen significant disruption on a number of fronts as a result of the coronavirus shutdown and the impending economic slump of consumer demand. Distribution becomes challenging during the Covid-19 shutdown. Additionally, when customers stopped going to stores, the FMCG sector's goods sales plummeted. The FMCG industry saw a significant impact with Covid-19 relative to the entire sector (Hossain et al., 2020). The demand for a small number of consumer items increased, nevertheless, and as a result, department shops ran out of a small number of essential consumer goods. The demand for soap, hand washing, hand sanitizer, air purifiers, detergents, antibacterial lotions, and other personal care products was rising. Additionally, it was difficult to get raw materials, which led to product scarcity and a rise in product costs. Additionally, because the majority of FMCG firms in Bangladesh work with independent distributors who employ sales agents, their operations were significantly disrupted during the Covid-19 shutdown. As a result, this industry requires a lot of attention and must implement digitization (Kibria, 2020).

However, several businesses in this industry have already taken steps to address the difficulties brought on by the Covid-19 epidemic. The majority of the factories are situated outside of or around the capital city of Dhaka. In this instance, the businesses were assigning half of their personnel to work for three days and the other half for the other three days of the week. In order to meet increased customer demand and cut back on unnecessary expenditures, they also bought raw materials in bulk. Employers were given fully safe housing options by businesses like PRAN Foods and Akij Foods and Beverages (AFBL). Almost all businesses dispatched their sales reps and distributors equipped with the necessary precautions, sometimes even wearing PPE. Companies like Unilever offered shuttle services for employees on the care line. Orders may now be placed by phone or online with some businesses. Additionally, businesses were setting up virtual learning sessions for every employee so they could effectively address any issues of this nature (Pantho, 2020). Hence, it is crucial to adopt digitization

such as BCT for better supply chain performance in the FMCG sector in Bangladesh.

4. Blockchain Technology and Bangladesh's FMCG Sector during Covid-19

Global SCM has been severely disrupted by the Covid-19 outbreak in every industry owing to a lack of sourcing for the first time in ten years. In order to manage the SCM process effectively, organizations have to react during a pandemic and in the post-pandemic new normal condition (Chillakuri and Attili, 2022). The coronavirus crisis exposed the weakness of the contemporary SC, making the need for smart, robust, and digitalized supply chains and varied sourcing essential for the smooth operation of enterprises globally (Cavalcanti et al., 2022). Bangladesh's FMCG business was disproportionately impacted by the worldwide lockdown brought on by the Covid-19 outbreak for a number of reasons. The business is not built up to handle such an artificial boost in demand, even a quick, rapid increase in demand for goods like food. The majority of department shops and superstores claim that there is a scarcity of stock as a result. Due to disruptions in the global supply chains, the majority of firms will find it difficult to get raw materials; this might result in a lack of products and an increase in prices. At the distribution end, the consequences of coronavirus are also a great deal clearer. Most FMCG firms utilize third-party distributors and Sales Representatives (SRs) to deliver the completed product to retail venues. To stop the virus's spread, businesses have not yet terminated their distribution field workers. The majority of businesses are still in full distribution mode, which might put lives in danger through local transmission. A fictitious surge in demand will lead to brief price increases in the categories of soap, handwash, hand sanitizer, and personal care products overall. End customers will suffer because wholesalers would keep items on hand to profit from the price increase (Kibria, 2020).

Due to advantages like increased individual privacy, fewer intermediaries, transparency, trust-building, decreased fraud and corruption, and better tracking, blockchain-based businesses will have the biggest impact in developing nations like Bangladesh (Hasan and Sharif, 2018). As a result, many industries in Bangladesh, including the ready-to-wear, pharmaceutical, and food sectors, can adopt blockchain technology for digitization. While the majority of FMCG firms in Bangladesh are currently preparing to adopt digitalization, a few have already implemented BCT (Tasnim, 2020; Tasnim et al., 2023). In developed nations, new digital technologies like blockchain have emerged to digitize supply chain operations and improve SC performance by supplying real-time data, lowering operating costs, improving product tracking, highlighting product quality, and optimizing delivery (Dutta et al., 2020). It was difficult to coordinate all of the actions across the supply chain network during the Covid-19 epidemic. Additionally, tracking goods flow and information flow became crucial because of the epidemic, which put the whole world under lockdown pretty much everywhere. Because it was impossible to trace everything physically, the reliability of the source, the goods, and the information were in doubt (Choi et al., 2020). As a result, many firms find it extremely difficult to maintain openness and traceability. Due to the fact that the majority of businesses there performed all supply chain-related tasks manually, developing nations in particular faced several difficulties in this area. While the majority of businesses in industrialized nations have already adopted digital technology like BCT. As a result of being able to track everything digitally, they had fewer difficulties during the Covid-19 epidemic. Therefore, by applying BCT for supply chain network management, businesses in underdeveloped nations may overcome the difficulties they encountered during the Covid-19 epidemic.

In addition, the Bangladeshi government is attempting to concentrate on digitization in a variety of sectors, including education, agriculture, industry, health, the economy, services, fast-moving consumer products, and many more. As a result, the corporate organizations in these sectors must do their share to adopt digitalization in order to improve their performance and adapt to globalization. Additionally, the pandemic of COVID-19 has sped up the adoption of digitalization, particularly across a range of industries (Nile, 2022). Although there is increasing interest in digitizing supply chains, there has been little progress in actually doing so (Sharma and Joshi, 2021). Hence more BCT adoption is required for SCP.

5.Significance of the study

The report would be helpful to business professionals for the SCP growth of Bangladesh's FMCG industry. The findings of this study will be helpful to the FMCG sector in Bangladesh and other emerging nations. Industry practitioners will get insight into how BCT adoption may impact their organizations' supply chain performance. Globalization has made all industries competitive, and digitalization is a new standard that must be applied to all supply chain procedures in order to increase efficiency and compete in the extremely dynamic economic climate. The performance of the supply chain will be strongly impacted by digitalization, such as BCT, according to this study's empirical research and review of the literature. Moreover, the industry practitioners will find out the required criteria to be fulfilled to adopt BCT.

Additionally, implementing BCT may aid a business in improving the performance of its supply chain, which includes items for food, medicine, cosmetics, dairy, drinks, and chemicals. This can aid practitioners in the FMCG sector in understanding how the implementation of BCTs may ultimately affect supply chain efficiency.

Additionally, the present study helps industry practitioners better grasp how to get a competitive edge. They may also understand the effects on supply chain performance and serve as a role model for other businesses looking to embrace BCT. In conclusion, this study will serve as a distinctive example for industry professionals, assisting them in comprehending the significance of digitalization for improving supply chain performance in Bangladesh's FMCG sector and restructuring the supply chain management process.

The study's findings will assist FMCG firms in Bangladesh and other developing nations by encouraging them to use digitalization techniques like BCT. Adopting BCT can improve the effectiveness of FMCG firms' whole supply chain management process (Sarwar et al., 2021). Additionally, this industry may generate additional employment opportunities and will support societal advancement.

6.Conclusion

This report offers a thorough insight into BCT adoption and how it impacts Bangladesh's FMCG industry's supply chain performance. The report also lists variables that may affect BCT adoption and ultimately supply chain effectiveness. The majority of supply chain operations in the FMCG industry of Bangladesh are paper-based, which makes them complicated, time-consuming, ineffective, and subject to the possibility of fraud. They also include several stakeholders and middlemen and have tracking concerns. Blockchain technology might assist in getting rid of the middlemen who contribute to delays and inaccurate payments. The use of blockchain technology also helps to reduce stakeholder risks and transaction costs related to SC occurrences. Additionally, by utilizing blockchain technology, the risks and fraudulent activities connected to the FMCG supply chain may be reduced. Utilizing BCT will also improve product quality, security, and safety as BCT provides better tracking processes and data security. Despite the widespread promotion of BCT in Bangladesh, little of this technology has actually been put into practice. Many businesses throughout the world have already used BCT, although it is unclear what effects may be anticipated following BCT adoption (Saberi et al. 2019). In the future, industry-specific research will be needed to gain a comprehensive understanding of BCT adoption and its effects on performance. These studies will need to be cross-sectional and longitudinal.

In essence, the study offers an empirical output of the factors needed for SCP and BCT acceptance. Researchers may examine various BCT strands and their effects on supply chain performance because this technology adoption is still in its infancy. Bangladesh's economy is significantly dependent on the success of its FMCG companies. The expansion of the industry has advantages for both social improvement and increased employment prospects. The government may set up rules that encourage BCT adoption for the supply chain performance improvement of this industry and offer this firm the necessary help.

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