

**DIGITAL TRANSFORMATIONS IN LOGISTICS OPERATIONS:  
CHALLENGES AND ENABLERS IN FAST MOVING CONSUMER GOODS  
(FMCG) SECTOR IN BANGLADESH**

**By**

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**A thesis submitted to the Department of Business Administration BIGD in partial  
fulfillment of the requirements for the degree of  
Masters in Procurement and Supply Management (MPSM)**

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## STUDENT'S DECLARATION

1. The dissertation submitted is my own original work while completing degree at BRAC University.
2. The dissertation 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 dissertation 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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## APPROVAL

The dissertation titled “Digital Transformations in Logistics Operations: Challenges and Enablers in Fast Moving Consumer Goods (FMCG) sector in Bangladesh” submitted by Mohammed Imam Hossain, ID Number: 20282027, Batch: 20, Masters in Procurement and Supply Management (MPSM), Department of Business Administration, BRAC University, Bangladesh, has been accepted as satisfactory in partial fulfilment of the requirement for the degree of Masters in Procurement and Supply Management (MPSM).

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## **Ethics Statement**

As the sole author of this research paper, I affirm my unwavering commitment to upholding the highest ethical standards throughout the entire research process. This study was conducted in strict accordance with ethical principles, ensuring the protection of participants' rights, dignity, and welfare.

Prior to their involvement, participants were provided with comprehensive information about the study's objectives, procedures, potential risks, and benefits. Informed consent was obtained from each participant, and their autonomy was respected throughout the research process. Confidentiality and anonymity were rigorously maintained to safeguard the privacy of participants, with all data securely stored and anonymized for analysis.

I have taken proactive measures to minimize potential risks to participants and have prioritized their well-being at every stage of the research. Additionally, I have conducted this study with honesty, integrity, and transparency, accurately reporting the findings and acknowledging any limitations or biases.

In compliance with all relevant regulatory standards and institutional policies, I affirm that this research adheres to the highest ethical standards. My dedication to ethical conduct extends beyond this study, driving me to contribute responsibly to the academic community while upholding the principles of ethical inquiry.

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## **ABSTRACT**

Over the last few decades, Bangladesh has seen substantial changes in organizational structures, techniques, and technologies for managing company and supply chain logistics. This is mostly due to the business digitalization paradigm, as well as the adoption of new technology-based solutions. Companies operating in Bangladesh, as well as local organizations, have prioritized overall system automations and logistics upgrades, such as large-scale automation of corporate information systems. They have also become participants in electronic trading platforms and e-commerce services, forming virtual clones.

The notion of logistics transformations is based on the ability to create a unified information field for the supply chain and provide quality information to decision-makers. It is a critical aspect in optimizing resources and expenses. Bangladesh's logistics and SCM business is still in its early phases of development, with many group firms, multinationals, and joint ventures in Bangladesh only now beginning to investigate logistics outsourcing and provisioning opportunities.

As a result, digitization issues are not of paramount importance. The project intends to develop many hypotheses that will be tested by comparing the findings of a market analysis of applied transformations, information and communication technologies, and infrastructural solutions. The completed research contributes to the identification of the requirements and general patterns of the logistics industry's qualitative development.

The most practical impact in logistics has been observed in the first moving consumer sector. Since the mid-twentieth century, scientists have discussed the transition of information into the most important productive force and resource influencing company performance (P. Drucker, Alan Toffler, and others). This tendency has also been observed in the logistics business. In traditional logistics and SCM, the major object of research is material flow, which is used to create a system of optimal 7R management, 7 fatal waste management, and agile, lean concepts and standards. However, as the industry developed, it became possible to consider the value creation information chain.

Considering all the limitations and challenges, the present study aims to exploring the insight of the Logistics operations, transformations and challenges in Bangladesh. So as to determine the gap study in research, process improvements, logistics frame works, AI implementations will be the key success factors for the sustainable logistics management process, so that ensure of future strategy on logistics process for Bangladesh FMCG sectors will be able to prospect nationally as well globally.

**KEYWORDS:** Digital Transformation; Industry 4.0; Agile ; lean concepts; Logistics Operations, AI , FMCG Industry in Bangladesh

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## List of Acronyms

AR	Augmented Reality
CPS	Cyber Physical Systems
CRM	Customer Relationship Management
FMCG	Fast-Moving Consumer Goods
DT	Digital Transformation
ICT	Information and Communication Technology
IoS	Internet of Services
IoT	Internet of Things
IT	Information Technology
KPI	Key Performance Indicator
L&SCM	Logistics and Supply Chain Management
NGT	Nominal Group Technique
PLM	Product Lifecycle Management
PPS	Production Planning and Scheduling
RAMI 4.0	Reference Architecture Model Industry 4.0
RBV	Resource-based view
RFID	Radio Frequency Identification
SC	Supply Chain
SCM	Supply Chain Management
SLR	Systematic literature review
STS	Socio-technological systems
VR	Virtual Reality
GDP	Gross Domestic Products
SDG	Sustainable Development Goals
PRISM	Performance of Routine Information System Management
PI	Physical Internet
DI	Digital Internet
AI	Artificial Intelligent
ML	Machine Learning
LSP	Local Service Provider

# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

Globally, the digital transformation has had a significant impact on the fast-moving consumer goods (FMCG) industry. The FMCG industry in Bangladesh makes use of digital technology to enhance logistics processes. The fast-moving consumer goods (FMCG) business in Bangladesh is one of the fastest-growing economic sectors and a major contributor to the GDP (Global Domestic Product) of the nation. This industry produces a wide range of goods, including medicines, food and drink, personal hygiene, and home care products. As the industry developed, though, businesses encountered more and more difficulties. Because of the fierce competition and shifting consumer preferences, Bangladesh's fast-growing FMCG industry finds it difficult to attract and keep consumers.

According to a survey by the Bangladesh Brand Forum, one of the fastest-growing economic sectors in Bangladesh is the fast-moving consumer goods (FMCG) business, which experienced a compound annual growth rate of 12.5% between 2010 and 2019. An estimated USD 30 billion is invested in this area, which accounts for around 35% of the country's industrial output (Bangladesh Investment Development Authority, 2022). Bangladeshi FMCG companies are adopting digital transformation to address these concerns. The transition to digital technologies is transforming how customers interact with organizations and how they operate.

Supply chain logistics operations are a crucial part of the digital revolution that Bangladesh's FMCG industry is generally undergoing. This study examines how the digital transformation has impacted logistics operations in Bangladesh's FMCG sector to help businesses remain competitive in the market. It also provides guidance and understanding for individuals looking to improve their supply chain competencies.

## 1.2 Background

Supply chain management and logistics could be greatly enhanced by digital transformation (DT) (Junge, 2020). Manufacturing firms are committed to moving much closer to the consumer and using their resources more efficiently as a result of this transformation, which is mostly driven by technology. It also creates new opportunities for growth and new business models. Companies are under pressure to take into account DT efforts due to both internal and external trends. The demand for digital interfaces and the growing complexity of goods, services, and supplier management are examples of external developments. These are made worse by the unique needs of each customer and shifting purchasing patterns across several channels. Competition is growing as a result of recently founded businesses using digital business methods. The digitization of business operations is one example of an internal trend that will increase transparency along the value network.

Amazon and other such providers are contributing to the ever-accelerating speed of manufacturing and logistics. When operating internationally, many businesses find that their operations become less efficient and more difficult. By addressing complexity, DT technologies can aid in the creation of leaner systems. On the one hand, technologies can facilitate the anticipation and avoidance of risk, and on the other, they can act as a facilitator for novel business models.

Still, it begs the question: What precisely is DT in logistics? There isn't currently a uniform, generally acknowledged definition of this phrase, despite the growing quantity of publications in this field. The definitions of DT, Industry 4.0, and L&SCM 4.0 are ambiguous and poorly understood.

Although there are few scientific papers regarding the impact of DT on L&SCM, the literature implies that the potential of DT in L&SCM corresponds to the capacities of decentralization, self-regulation, and autonomous intelligence (machine learning). DT is complicated and can impact several or every business division. Managers frequently don't know what choices and components (such technologies) are worthwhile for DT. In addition to the growing significance of DT, another query is which precise tactics and tangible fixes are most appropriate for particular businesses. The anticipated additional value of implementing and utilizing a specific technology or technology bundle ought to be one of the motivators. By tying the application of DT technologies to consumer value added, this thesis seeks to close this gap.

### **1.3 Statement of the Problem**

Traditionally, Bangladesh's fast-moving consumer goods (FMCG) industry has mostly reached out to consumers through physical distribution networks and brick-and-mortar retail storefronts. Despite rising digital use and shifting consumer preferences, FMCG companies in Bangladesh struggle to provide a consistent and tailored client experience (Saha et al., 2021). In addition, the COVID-19 epidemic has accelerated the shift to digital platforms, making digital transformation initiatives essential for FMCG firms to maintain their competitiveness. This issue focuses on analyzing the barriers, enablers, and success factors that impact Bangladesh's FMCG industry in addition to investigating the potential impacts of digital developments on logistical operations. A digital revolution is currently taking place in Bangladesh's FMCG sector with the aim of improving logistics operations.

### **1.4 Objectives**

Within the aforementioned framework, the objective of this research is to evaluate the potential contributions of technologies relevant to digital transformation. The following research goals are intended to be pursued by the study described in this thesis:

- A) To critically review the current status of Digital Transformations in logistics operations of FMCG industries in Bangladesh;
- B) To identify the major challenges towards effective digital transformations in logistics operations;
- C) To suggest and develops policy and operational framework for digital transformations in the standard organizations.

### **1.5 Significance**

Academic focus on logistics operations is important for numerous reasons, including:

- a) Logistics are critical to supply chain management, as they have a direct impact on customer demand.
- b) If an organization's or business's products are properly and efficiently moved, it can meet or even exceed client demand.
- c) Overhead costs can be minimized by automating the procedures for procuring goods from suppliers, shipping, and warehousing. Because supply chain management involves multiple departments, communication should be easy.

This contributes to the creation of a workflow that, through raising visibility, lowers costs. Costs are decreased by lowering the cost of warehousing. Companies will only make purchases based solely on supply projections, effective inventory control, reliable shipping, and prompt product delivery to customers.

## **1.6 Limitations**

This study can provide valuable insights, it is essential to recognize its potential limitations to ensure a nuanced understanding of the findings. Some limitations of this study may include:

The study's findings might be based on a limited number of FMCG companies or a specific subset of the industry in Bangladesh. As a result, the results may not fully represent the diverse range of challenges and enablers that exist across the entire FMCG sector in the country.

The quality of the study heavily depends on the methodologies used for data collection. If the data is gathered solely through interviews or surveys, there might be potential biases or limitations in the respondents' perspectives, leading to incomplete or skewed results.

The study may not account for various levels of technology adoption among different FMCG companies, resulting in a skewed perspective of the overall industry's progress in digital transformation.

The researcher himself may have certain biases or preconceived notions that could inadvertently influence the study's design, data interpretation, or conclusions.

## **1.7 Research Methodology**

This study applied a qualitative and exploratory research approach to analyze the intricate and dynamic nature of logistics operations in Bangladesh's FMCG sector, with the goal of better understanding how digital revolution has affected this crucial aspect of corporate operations. It has also employed an inductive technique to construct new theories or hypotheses based on observations and previously available data, which entails reasoning from specific facts to bigger generalizations.

## **1.8 Research Methods**

The relevant data of this research were collected by the following methods:

### **1.8.1 Interview**

To enable the researcher to concentrate on individuals with traits or experiences related to the research subject, study participants were chosen with the use of a purposive interview group. Through semi-structured interviews, the researcher was able to understand more specific details about the perspectives, methods, and experiences of the participants with logistics operations in the context of digital transformation. A thematic analysis was conducted on the material gathered from the interviews. Theme analysis involves identifying patterns and topics in the data and developing a coding scheme to arrange and examine them. Research problem knowledge was comprehensive thanks to themes and codes derived from the data. The investigator employed an iterative and intuitive approach to analysis, going back to the initial codes and data as needed.

Finding and speaking with a group of Bangladeshi FMCG industry participants who were knowledgeable about digital transformation and logistics operations was part of the study's selection process. The idea was to get these individuals to share their qualitative observations and ideas. The research topic was thoroughly examined by carefully selecting the participants based on their work titles and departments. The department of digital transformation selected four participants, while the logistical operations department selected four more.

People with a variety of viewpoints and levels of experience in digital transformation and logistics operations in the FMCG industry could be included thanks to this tactic. The interviews lasted between thirty and fifty minutes each, giving participant's ample time to share their thoughts and insights. The interview time was strategically selected to ensure maximum participation, allow for in-depth discussions, and streamline data collection.

The purpose of this qualitative study was to investigate and comprehend the perspectives and experiences of individuals in the FMCG industry regarding logistical operations.

The study aimed to gather a diverse set of viewpoints and ideas through group interviews in order to gain a full understanding of how digital revolution affects logistics operations in this sector.

For this qualitative study, a group of Bangladeshi FMCG sector workers with competence in logistics operations and digital transformation were interviewed multiple times.

## Interviews conducted

Company	Designations	Management Positional hierarchy	Specific Questions/Areas of Queries
ACI	Head of Business/ Head of Logistics	Top Management	Digital transformations status and challenges
CEAT	Commercial and logistics	Top Management/ Entry level	Logistics challenges, software upgradations
Novartis	Product Manager	Mid management	Success factors, recommendations on DT
BRAC Dairy	Head of Logistics/ Fleet Operators	Mid management/ Entry level employee	Cold chain logistics, operations challenges

**Table 1: Interview on specific questions**

### 1.8.2 Focus Group Discussions

Focus groups are participatory forums for conversation. They are favored over in-person interviews due to their interactive nature, which allows one participant's statements to prompt responses from other participants. Usually, multiple groups are involved, and the moderator and observer evaluate the outcomes based on their judgment. Attendees are not required to provide a predetermined response. Due to the need for additional interpretation by the researcher to "translate" the unstructured data into both qualitative and quantitative data, data collection becomes more complex as a result (van der Zanden et al., 2014). A group of seven to twelve individuals from the management level of digital transformations in logistics operations organizations were asked comparable, predetermined questions by the researcher in order to gather pertinent data.

#### Focus group discussions

Company	Groups	Group size	Specific Questions
ACI	Operations team	2 persons	Digital transformations status and challenges
CEAT	Warehouse team	10 persons	Logistics challenges, software upgradations
Novartis	Sales team	10 persons	Success factors, recommendations on DT
BRAC Dairy	Fleet team	18 persons	Cold chain logistics, operations challenges

**Table 2: Focus Group discussions**



### **1.8.3 Secondary Literature Review**

While secondary literature is frequently more descriptive and helpful for locating introductory content, it is not as recent as primary literature. I have reviewed the results, research gaps, and limitations of earlier studies, including published articles, review papers, and books, in this study.

### **1.8.4 Documentary Research**

To accelerate this study different official documents, log books, files, circulars and proceedings etc. regarding digital transformations in logistics operations of FMCG industries in Bangladesh were studied.

### **1.8.5 Data Analysis Tools**

In this study, participant interview data from Bangladesh's FMCG business was actively analyzed using thematic data analysis methodologies. Theoretically, the approach can be changed, setting thematic analysis apart from other methods of analyzing qualitative data (Braun and Clarke, 2006). Thematic analysis is a useful method for examining a broad range of research topics and qualitative data, including media, transcripts, focus groups, interviews, and so on.

The interviews in the current study were first performed digitally utilizing the Zoom video conference technology in order to prevent biases like emotions during meetings. The section of the appendix contains a transcript of the data collected from the respondents. The topic data analysis step comes next. Highlighting details from the key aspects of the interview data is the third and last phase. After that, the whole theme data analysis was finished.

### **1.8.6 Qualitative Data Analysis Techniques**

Qualitative data, such as papers, transcripts, and interview notes, were examined using qualitative data analysis methods for the current thesis topic. Thematic analysis was used to interpret the interview results.

This technique included various parts, such as familiarization, coding, category construction, topic evaluation, theme definition and naming, and writing the final findings.

The first step in qualitative interview analysis is to develop and implement codes. The transcript is necessary for data coding and further categorization. A code represents a subject or an idea and can be a single word or a string of words. There are three stages of coding: open, axial, and selective coding.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter aims to review selected literature on the subject, particularly focusing on the major concepts of Digital Transformation, Fast Moving Consumer Goods (FMCG), and Logistics Operations and the related literature review. The chapter consists of three sections. The first section reviews existing literature on Fast Moving Consumer Goods (FMCG), exploring consumer behavior, market trends, and marketing strategies within the sector. The second section describes some definitions LSCM. Finally, the last section describes the Interpretation of DT in L& SCM.

#### **2.1 Related Literature Review on FMCG**

The literature extensively explores the critical role that digitization plays in optimizing transportation and warehouse performance within the fast-moving consumer goods (FMCG) logistics sector. It is widely acknowledged that leveraging digital technologies can significantly enhance the efficiency and effectiveness of FMCG supply chains (Bowersox & Closs, 2020). However, while the importance of digitization is well-recognized, there exists an opportunity for further investigation into specific strategies and technologies aimed at optimizing FMCG logistics performance.

In particular, empirical studies that focus on real-world implementations and outcomes would provide invaluable insights into the most effective practices. By examining case studies and conducting field research, researchers can gain a deeper understanding of the practical challenges and opportunities associated with implementing digital solutions in FMCG logistics operations (Hausman et al., 2019).

Moreover, the study by Chauhan et al. (2023) underscores the crucial role of Industry 4.0 technologies in sustainable supply chain management (SCM). However, while there is growing recognition of the potential benefits of Industry 4.0 technologies in enhancing sustainability within supply chains, the existing literature reveals a gap in understanding the specific implications of these technologies for sustainable SCM practices.

Future research could delve deeper into the potential benefits, challenges, and best practices associated with integrating Industry 4.0 technologies into sustainability-focused supply chains (Tachizawa & Wong, 2014). By examining case studies and conducting empirical research, researchers can identify the most effective ways to leverage technologies such as the Internet of Things (IoT), artificial intelligence (AI), and blockchain to achieve sustainability goals within FMCG supply chains.

Furthermore, while there is existing evidence to support the role of digital transformation in supporting green supply chain management (GSCM), there is a need for more empirical studies to demonstrate the tangible impact of digital technologies on improving environmental performance in supply chains (Sarkis et al., 2019).

By conducting quantitative analyses and evaluating the environmental benefits of digital transformation initiatives, researchers can provide valuable insights into the effectiveness of these technologies in driving sustainability within FMCG supply chains. Additionally, identifying specific successes and quantifying the environmental benefits of digital transformation would provide actionable insights for practitioners seeking to enhance the sustainability of their supply chain operations.

The literature review also highlights the evolving nature of the field of supply chain digitization and the lack of structure in existing research (Christopher, 2016). While there is a wealth of literature on various aspects of supply chain digitization, there remains a need for comprehensive and structured reviews that explore the full spectrum of digital technologies and their impact on supply chain performance.

Future research endeavors could undertake systematic reviews of the literature, employing both qualitative and quantitative methods to provide a holistic understanding of the current state of research on supply chain digitization (Monczka et al., 2019). By synthesizing existing knowledge and identifying research gaps, such studies can provide valuable guidance for future research directions and inform practitioners seeking to leverage digital technologies to enhance their supply chain operations.

Lastly, the discussion on the necessity of a mixed-method approach in research methodology is noteworthy. By combining quantitative and qualitative methods, researchers can gain a more comprehensive understanding of complex supply chain problems and potential solutions (Seuring & Gold, 2012). Future studies could build upon this approach, employing a range of research methods to investigate the multifaceted challenges and opportunities associated with supply chain digitization in the FMCG industry.

## 2.2 Definition of L&SCM

Source	Definition of L&SCM
Straube (2004)	Planning, directing, carrying out, and controlling all information and material flow within and between businesses are all included in process-oriented logistics. Businesses must execute logistically well in order to gain market share and achieve financial success by meeting client expectations.
APICS (2008)	In order to meet customer expectations, supply chain management organizes, carries out, and regulates the efficient, effective forward and reverse movement and storage of goods, services, and related information between the point of origin and the site of consumption.
Cristopher (2011)	In order to provide a systemic perspective of the company, logistics is an integrated notion. At its core, it is a planning concept that aims to establish a framework that translates market demands into a production strategy and plan, which subsequently connects to a procurement strategy and plan. To replace the traditional stand-alone and independent plans of marketing, distribution, production, and procurement, the company should ideally adopt a "one-plan" attitude. The goal of logistics management is this, to put it simply.

**Table 3: Definitions of logistics and supply chain management.**

## 2.3 Interpretation of DT in L& SCM

Source	Interpretation of DT in L&SCM
Moser et al. (2016)	The foundation of DT is the growing usage of sensors and the interconnectedness of goods, services, and processes. This results in new product and service functions as well as a visualization of the entire SC.
Bogner et al. (2016)	The integration and optimization of information and the movement of items along the supply chain are considered to be aspects of digitalization. The fundamental tenet of this is a continuously digitalized data flow across a company's whole value chain, free from media discontinuities.
Korpela et al. (2017)	In digital SC, collaboration is a multi-stakeholder project with varying demands and objectives. Large corporations are viewed as hub entities that collaborate with their suppliers to complete integration tasks.
Hofmann and Rüsçh (2017)	The internet and other network applications, such as the block chain, allow for the flexible connection of goods and services (consistent connectivity and computerization). Digital connectivity makes it possible for products and services

	to be produced automatically and optimally, including for them to be delivered without the need for human intervention (self-adapting production systems based on transparency and predictive power). While system components (such as transportation vehicles or manufacturing facilities) make autonomous decisions, the value networks are under decentralized control (autonomous and decentralized decision making).
Bowersox et al. (2005)	The only way to achieve true excellence in the supply chain is to implement a digital business transformation. This shift takes advantage of all that technology has to offer, makes supply chain collaboration easier, and raises the bar for operational excellence. The transition is a process rather than a one-time task.
Kersten et al. (2018)	Within L&SCM, digital transformation (DT) refers to how value creation processes are altered by utilizing technology, modifying business strategies, and obtaining the necessary skills and credentials. Increases in productivity, flexibility, and customer attention are the goals of DT.
Straube(2017)	"Smart logistics is evolving into flexible, low-interference, decentralized, real-time, self-controlling processes with cognitive capabilities through the use of intelligent technologies, data analytics, and the emergence of new actors and business models." The incorporation of semi-autonomous systems enables the automation and integration of intelligent items together with their physical and organizational interfaces.

**Table 4: Interpretations of digital transformation in logistics and supply chain management (Source: adapted from several journal)**

## **CHAPTER THREE**

### **AN OVERVIEW OF CURRENT STATE OF DT IN THE FMCG SECTOR of BANGLADESH**

#### **3.1 Introduction:**

This chapter focuses on current state of digital transformations in selected organizations in FMCG sector of Bangladesh.

The chapter consists of three sections. The first section focuses on Bangladesh perspective. The second section outlines the core processes involved in logistics and supply chain management, including procurement, inventory management, and transportation. The last section explores the key features, usage and benefits of digitally mature logistics and supply chain management systems, E-commerce platforms, supply chain optimizations process focusing on real-time tracking and adoptions data of Mobile apps in Bangladesh.

#### **3.2 Digital transformations \_Bangladesh Perspectives**

In recent years, Bangladesh has witnessed a remarkable surge in digital transformation across various industries, and the Fast-Moving Consumer Goods (FMCG) sector is no exception. As the global business landscape evolves, companies within the FMCG sector in Bangladesh are embracing digital technologies to streamline operations, enhance customer experiences, and stay competitive in an ever-changing market. The convergence of digital innovations, shifting consumer behaviors, and a growing digital infrastructure has catalyzed a significant paradigm shift in the way FMCG businesses operate and interact with their stakeholders.

Traditionally, the FMCG sector in Bangladesh has been characterized by its reliance on traditional distribution channels, manual processes, and limited use of digital technologies. However, recognizing the potential benefits of digitalization, companies are now investing in transformative technologies to optimize supply chain management, improve marketing strategies, and elevate overall operational efficiency. This shift is not only driven by the need to adapt to a rapidly digitizing global economy but also by the changing expectations of consumers who are increasingly tech-savvy and demand seamless digital experiences.

Key drivers of digital transformation in the Bangladesh FMCG sector include the widespread availability of affordable smartphones, expanding internet connectivity, and a growing middle-class population with rising disposable incomes. These factors have created a conducive environment for the integration of digital solutions, enabling FMCG companies to engage with consumers more effectively, optimize resource utilization, and respond swiftly to market dynamics.

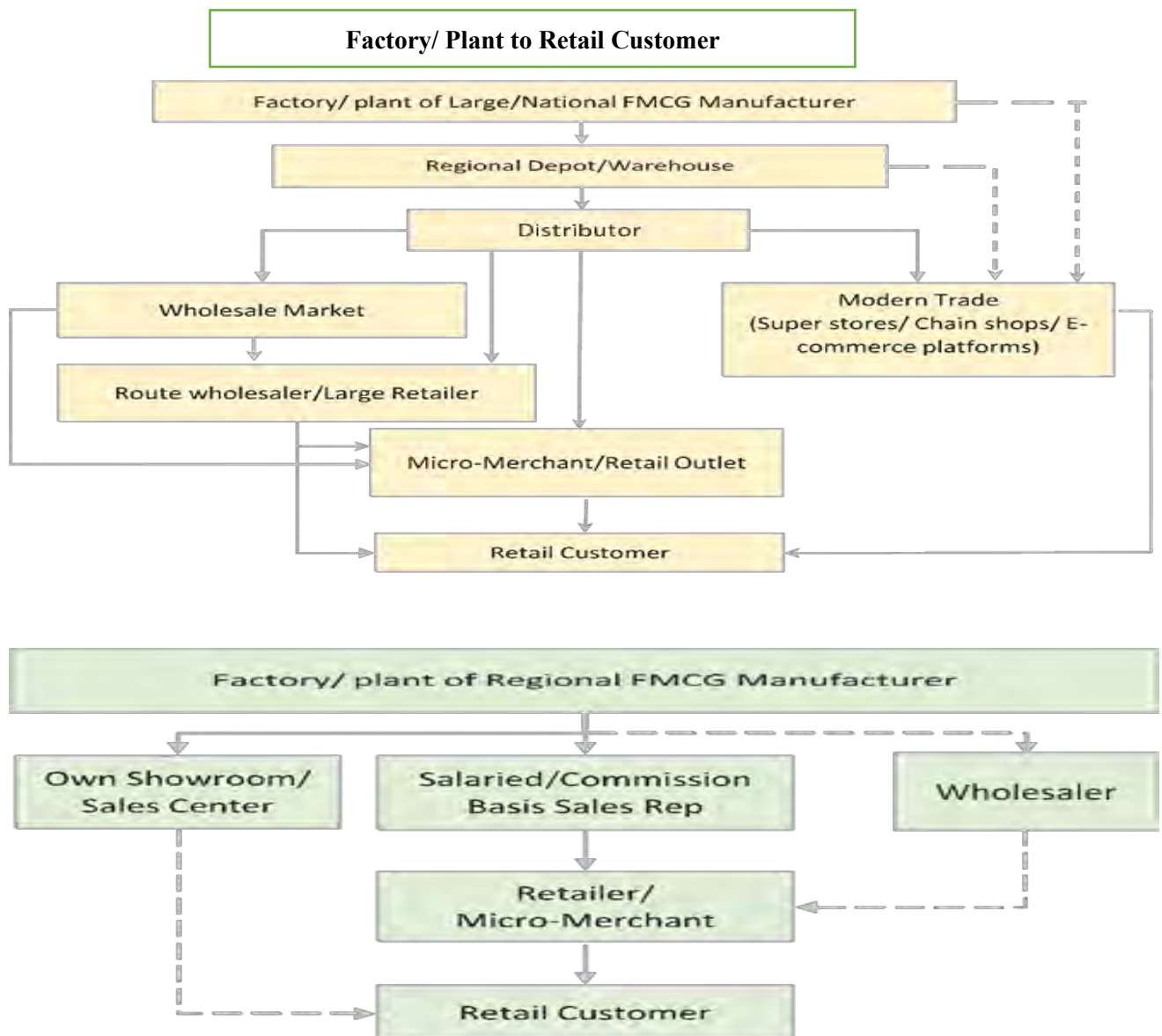
### **3.3 Core process followed in FMCG industries**

FMCG companies can be broadly categorized into two types based on their size, market presence, and distribution network coverage: (i) Large FMCG companies with a nationwide distribution coverage and (ii) Regional medium and small FMCG companies with a presence within a specific region (e.g., within a specific division/ few districts/ Upazilla level).

To facilitate distribution, major FMCG businesses segregate the nation into multiple regions, locating their depots or warehouses in each of these areas. Third parties or the FMCG firms themselves are in charge of these locations. FMCG companies use three different channels to distribute their products: traditional channels, wholesalers, and alternative channels, which are primarily found in urban regions and include modern superstores, chain stores, and e-commerce platforms.

Across their operational area, distributors in a normal retail sales-based organization's primary and secondary sales channels deliver merchandise from the central warehouse to the retailers. In order to effectively reach the last mile merchants in a given area, the FMCG firm establishes a network of distributors (and dealers, if necessary) to oversee this operation. To deliver the ordered products to the retailers, regional sales operations management is tasked with managing the distributors and dealers. In contrast, the FMCG Company uses a field sales staff of its own to pick up orders from the shops. There are a few other participants in the supply chain. In the supply chain, route wholesalers are essentially big retailers situated inside a group of outlets; smaller retailers in certain areas purchase goods from the route wholesalers on a need-basis. There is a pool of salaried and commission-based sales representatives accessible at the regional level for FMCG manufacturers and producers. They transport the goods from local FMCG producers straight to the retail locations of micro-merchants. Products from local manufacturers are occasionally also offered for sale through distributors, showrooms, and sales centres. Using a projection derived from the Bangladesh Survey's 2018 Landscape Assessment of Retail Micro-Merchandise Survey,

There are approximately 2,000 distributors and between 15,000 and 20,000 wholesalers currently active in the FMCG supply chain. Generic supply chain distribution structure for both large scale FMCG manufacturers and regional small and medium scale FMCG manufacturers in Bangladesh is presented in the figure 3



**Figure-1: Generic FMCG supply chain distribution structure in Bangladesh, (Source: the author’s own fieldwork)**

### 3.4 Ecommerce Platforms.

E-commerce platforms have witnessed significant adoption within the FMCG sector in Bangladesh. FMCG companies like ACI, Novartis, CEAT and BRAC Dairy are increasingly partnering with established e-commerce platforms and developing their online sales channels. This shift is not only a response to changing consumer preferences but also a strategic move to tap into the immense potential of online retail. Additionally, mobile payment systems and digital wallets are becoming integral for facilitating seamless transactions in the e-commerce space.



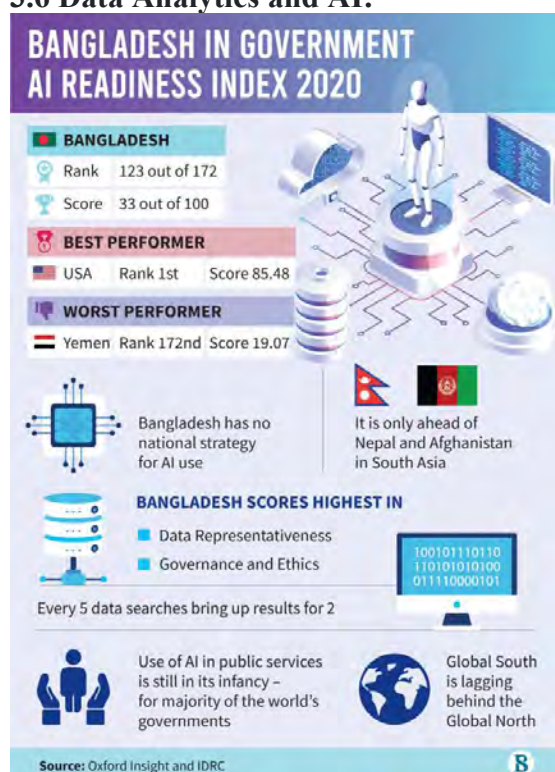
### 3.5 Supply Chain Optimization:



**Figure-2 Supply chain optimization process (Source: adapted from The Business Standards)**

Digital technologies are revolutionizing supply chain management in the FMCG sector. Companies like ACI, Novartis, CEAT and Square groups are employing advanced analytics to analyze historical data, predict demand fluctuations, and optimize inventory levels. IoT devices are used for real-time monitoring of stock levels, ensuring timely replenishments, and reducing instances of stockouts. Blockchain technology is being explored for enhancing transparency and traceability across the supply chain, assuring consumers of product authenticity and quality.

### 3.6 Data Analytics and AI:



Data analytics and AI applications are increasingly shaping decision-making processes in the FMCG sector. Companies are leveraging data analytics tools to gain insights into consumer behavior, preferences, and market trends. AI-driven algorithms aid in demand forecasting, allowing companies to optimize production and distribution. Chatbots and virtual assistants powered by AI enhance customer interactions, providing instant support and personalized recommendations.

Although Bangladesh ranked 123 out of 172 scores 33 out of 100 in AI readiness index 2020 but, large companies like ACI, Square, BRAC are using data analytics and AI applications for their business operations and for strategy settings.

**Figure-3 Data Analytics and AI (Source: adapted from Oxford insight and IDRC.**

### 3.7 Digital Marketing Strategies:

Digital marketing has become a cornerstone of brand promotion and consumer engagement in the FMCG sector. Social media platforms such as Facebook, Instagram, and Twitter are extensively utilized for targeted advertising campaigns. Influencer marketing is on the rise, with companies collaborating with social media influencers to endorse their products. Data analytics tools help in measuring the impact of digital marketing efforts, enabling companies to refine their strategies for maximum effectiveness.

### 3.8 Mobile App Adoption:

The Global System for Mobile Communications Association – commonly referred to as GSMA –has projected in its latest report that 62% of the mobile phone users in Bangladesh will have smartphones by 2025.

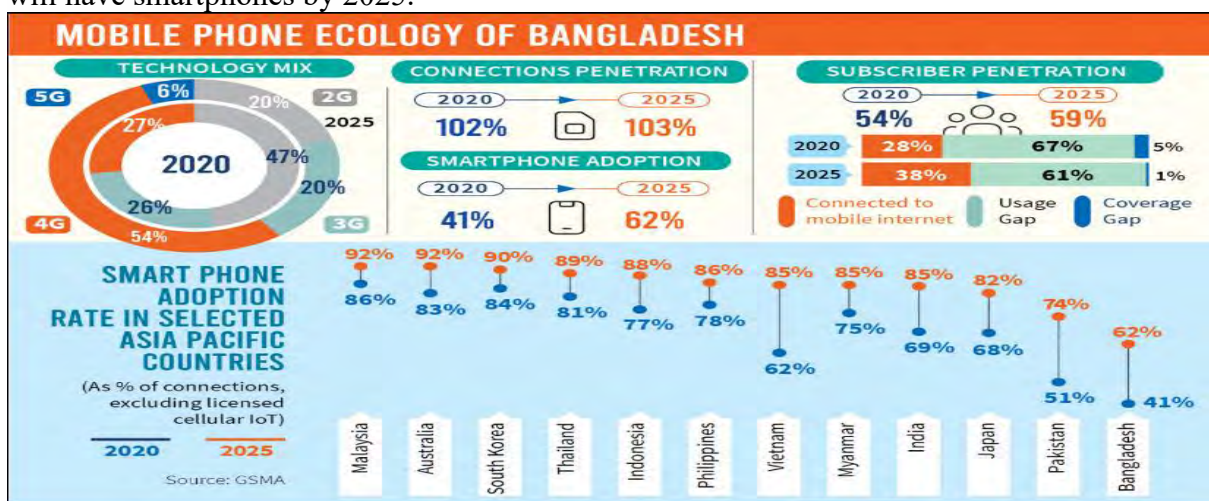


Figure 4: Mobile app adoption in Bangladesh (source: The business standards)

Many FMCG companies have recognized the importance of direct consumer engagement through mobile applications. These apps serve as a one-stop destination for consumers, offering product information, promotions, and loyalty programs. Companies leverage mobile apps not only for marketing but also for direct sales, creating a more personalized and convenient shopping experience for consumers.

**In conclusion**, the digital transformation of the FMCG sector in Bangladesh is a multifaceted process, marked by advancements in e-commerce, supply chain optimization, data analytics, and digital marketing. Overcoming challenges and capitalizing on opportunities will be crucial for the continued evolution of this sector in the digital era.

## CHAPTER FOUR

### Major Challenges of Digital Transformations in Logistics Operations: Perspective FMCG industries in Bangladesh

#### 4.1 Introduction:

Digital transformation has become a pivotal strategy for industries worldwide, including the fast-moving consumer goods (FMCG) sector in Bangladesh. As technology continues to advance at an unprecedented pace, FMCG companies are embracing digitalization to enhance their logistics operations. However, amidst the promise of efficiency gains and cost savings, several significant challenges persist. This paper explores the major hurdles faced by FMCG industries in Bangladesh as they navigate the complexities of digital transformation in their logistics operations. From infrastructure limitations to workforce readiness and regulatory concerns, understanding these challenges is crucial for devising effective strategies to overcome them and unlock the full potential of digitalization in the FMCG logistics landscape.

#### 4.2 Challenges, Enablers and Success Factor Perspective of FMCG Industry in Bangladesh

Digital transformations in logistics operations have become increasingly important for businesses, including the Fast-Moving Consumer Goods (FMCG) industry in Bangladesh. These transformations involve adopting digital technologies to improve efficiency, visibility, and overall performance in the logistics process. Let's explore the challenges, enablers, and success factors of digital transformations in logistics operations for the FMCG industry in Bangladesh:

##### Challenges:

1. Bangladesh may face challenges in terms of its digital infrastructure, such as limited internet connectivity and power supply, which can hamper the adoption of advanced digital technologies in Logistics Operations.
2. A lack of skilled professionals and limited awareness about digital technologies and their benefits in the logistics sector could hinder the adoption of digital solutions.
3. Implementing digital transformations can require significant investments, which might be a concern for some companies, especially smaller ones.
4. In a digitally connected logistics ecosystem, data security and privacy become paramount. Ensuring that sensitive information is adequately protected is essential.

### **4.3 Common challenges facing FMCG companies.**

#### **Digital transformations Challenges**

##### **Legacy Systems and Infrastructure:**

Many FMCG companies operate on outdated legacy systems, making it challenging to integrate new digital technologies seamlessly.

##### **Data Management and Analytics:**

Managing vast amounts of data generated by digital processes and utilizing analytics for actionable insights can be a hurdle for companies unfamiliar with advanced data management practices.

##### **Supply Chain Complexity:**

The FMCG supply chain is intricate, and implementing digital technologies to streamline processes, enhance visibility, and manage inventory efficiently can be complex and expensive.

##### **Consumer Engagement and Behavior:**

Understanding and adapting to rapidly changing consumer behavior in the digital age poses a challenge. FMCG companies need to invest in technologies that allow them to connect with consumers through various digital channels effectively.

##### **Regulatory Compliance:**

Adhering to evolving digital regulations and ensuring compliance, especially in areas like data privacy, can be demanding for FMCG companies operating globally.

##### **Talent and Skill Gaps:**

The shortage of skilled professionals with expertise in digital technologies can impede the successful implementation of digital transformation initiatives.

##### **Cybersecurity Concerns:**

As FMCG companies digitize their operations, they become more susceptible to cyber threats. Ensuring robust cybersecurity measures to protect sensitive data and prevent disruptions is crucial.

##### **Change Management:**

Employees may resist or struggle to adapt to new digital processes. Effective change management strategies are essential to ensure a smooth transition and maximize the benefits of digital transformation.

##### **Costs and Return on Investment (ROI):**

Digital transformations often involve significant upfront costs. FMCG companies need to carefully assess the return on investment and justify the expenses associated with implementing new technologies.

#### 4.4 Status comparison in 03 companies (Present challenges)

Integrating diverse digital technologies, such as IoT (Internet of Things), AI (Artificial Intelligence), and data analytics, into existing systems can be challenging. Ensuring these technologies work seamlessly together is crucial for optimizing operations.

Challenge Areas	Company-X	Company-Y	Company-Z
<b>Legacy Systems and Infrastructure:</b>	-Old infrastructure -Systems followed manual	-Moderate infrastructure -Systems followed manual	-Old infrastructure -Systems followed manual
<b>Data Management and Analytics:</b>	Data management , using local software, analytical works	Data management , using local software	Data management , using local software, analytical works
<b>Supply Chain Complexity:</b>	Faces serious issue during COVID	Dollar rate fluctuations affected	Faces serious issue during COVID
<b>Consumer Engagement and Behavior:</b>	Active	Active	Active
<b>Regulatory Compliance:</b>	Followed but lengthy approval process create difficulty	Followed but lengthy approval process create difficulty	Followed but lengthy approval process create difficulty
<b>Talent and Skill Gaps:</b>	High	Normal	High
<b>Cybersecurity Concerns:</b>	Yes	Yes	Yes
<b>Change Management:</b>	No	No	No
<b>Costs and Return on Investment (ROI):</b>	Yes	Yes	Yes
<b>Integration of Technologies:</b>	Development on progress	On going	On going

**Table 5 - Integrations of Technology data (Source: the author's own field works)**

Addressing these challenges requires a strategic and well-planned approach to digital transformation, involving a combination of technological investments, organizational changes, and a commitment to ongoing adaptation and improvement.

#### **4.5 Enablers:**

1. Supportive government policies and initiatives can encourage companies to invest in digital transformations and can help overcome infrastructure challenges.
2. Collaborating with technology providers, logistics partners, and industry experts can facilitate knowledge sharing and resource pooling for successful digital implementations.
3. As the e-commerce market in Bangladesh expands, companies are likely to invest more in digital logistics to meet increasing customer demands for fast and efficient deliveries.
4. Bangladesh has seen significant growth in mobile penetration, providing a substantial base for the adoption of mobile-based logistics solutions.

#### **4.6 Success Factors:**

1. Successful digital transformations in logistics require solutions that can scale and adapt to changing business needs and market dynamics.
2. Digital logistics solutions that offer real-time tracking and visibility throughout the supply chain can improve operational efficiency and customer satisfaction.
3. Utilizing data analytics to make informed decisions can enhance the overall logistics process, leading to better resource allocation and cost optimization.
4. Integrating various digital tools and automating processes can streamline operations, reduce manual errors, and enhance overall productivity.
5. Putting the customer at the center of the digital logistics strategy ensures that the focus remains on meeting customer demands and providing a seamless experience

Finally, digital transformations in logistics operations in the FMCG industry in Bangladesh can present both challenges and opportunities. Overcoming infrastructure limitations, building the necessary skills, and ensuring data security are significant hurdles. However, supportive government policies, collaborative partnerships, and a growing e-commerce market can serve as enablers. To succeed, companies must prioritize scalability, real-time tracking, data-driven decision-making, integration, automation, and a customer-centric approach in their digital logistics initiatives.

## CHAPTER FIVE

### SUMMARY FINDINGS, RECOMMENDATIONS AND CONCLUSION

#### 5. Introduction

In Bangladesh, like in many other countries, digital transformation in logistics and supply chain management is becoming increasingly important. The adoption of digital technologies and data-driven solutions can significantly improve the efficiency of logistics operations, optimize supply chain processes, and provide better visibility and control over the flow of goods and information.

Here are some aspects of the statements and concepts that are applicable to Bangladesh:

**Study Findings and Analyses:** In this chapter the study findings have been discussed. After collecting different data and information, findings have been presented and analyzed according to the objectives of the study. Questionnaire survey was used as a key instrument for primary data collection. There were structured (close ended) and unstructured (open ended) questions in the questionnaire to elicit both implicit and explicit responses from the respondents for the analysis of the quantitative and qualitative data. First, questionnaires were distributed to the respondents through e-mail. But response was very low. Secondary data was obtained from relevant literature like journal, reports, books, internet etc. Besides, face to face communications / key informant interviews were also performed. This chapter is organized into 02 (two) sections. The first section provides the summary of findings of the questionnaire survey which mainly included general information of the respondents, their logistics experiences, ICT infrastructure, management support, legal framework, challenges and recommendation for successful Digital transformations in logistics operations in FMCG sector, and second section provide recommendations and the necessary process to implement digital transformations in logistics update in Bangladesh.

## 5.1 Findings recorded from Questionnaire Survey

A total number of forty (40) responses were received. Major findings are depicted below

### 5.1.1 Profile of Respondents

Variable	Frequency		Percentage ( %)	
Gender	Male	36	90.0%	
	Female	4	10%	
	Total	40		
Variable	Frequency	Percentage ( %)	Variable	
Designation	ED/ CEO/ COO	5	12.5%	
	HOD	10	25%	
	Managers	10	25%	
	Executives	5	12.5%	
	Jr Officer/ Driver	10	25%	
Age	≤ 30 years	4		
	31- 40 years	18		
	41- 50 years	6		
	51- 60 years	12		
Level of education	Graduate	10 ( B.A- 1; B.Com-1; B.Sc in Engg.- 14)	25%	
	Post graduate	24	60%	
	HSC	6	15%	

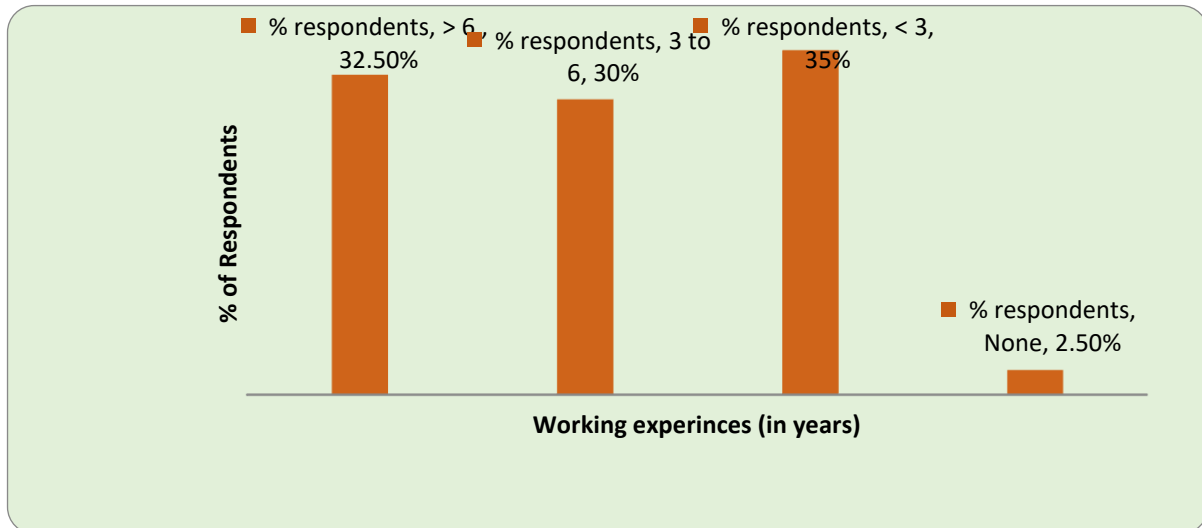
**Table-6: Profile of Respondents (Source: The author's fieldwork)**



### 5.1.2 Summary of Findings

#### *Working experience in Logistics field:*

To effectively implement digital transformations in the logistics field, it is crucial to have experienced individuals who possess the ability to adapt. The data collected from selected companies provides insights into the working experience of respondents in the logistics field.



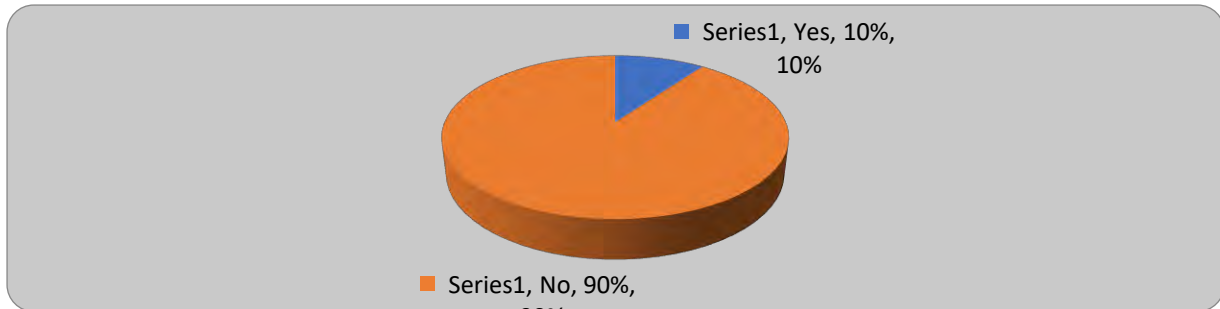
**Figure 5 : Working experience in Logistics (Source: The author’s fieldwork)**

According to Figure 5, 32.5% of the respondents have more than 6 years of working experience, indicating a significant portion of seasoned professionals. Additionally, 30% and 35% of respondents have 3 to 6 years' experience and below 3 years' experience, respectively, showcasing a mix of intermediate and entry-level experience. Only 2.5% of respondents reported having no experience in the field.

This distribution of experience levels suggests a diverse pool of talent within the logistics sector, which could potentially contribute to successful adoption and implementation of digital transformations which will give bright outcomes in logistics operations to enable digital transformations in aligned with the global perspectives.

**Logistics experience before joining current department:**

The study conducted revealed that a significant majority of respondents, comprising 90%, embarked on logistics activities within their current department without any prior experience in the field, and the only 10% are entering in this field with proper educational background and experiences.. This implies that the vast majority of individuals who transitioned into logistics roles did so without having worked in logistics before joining their current department.



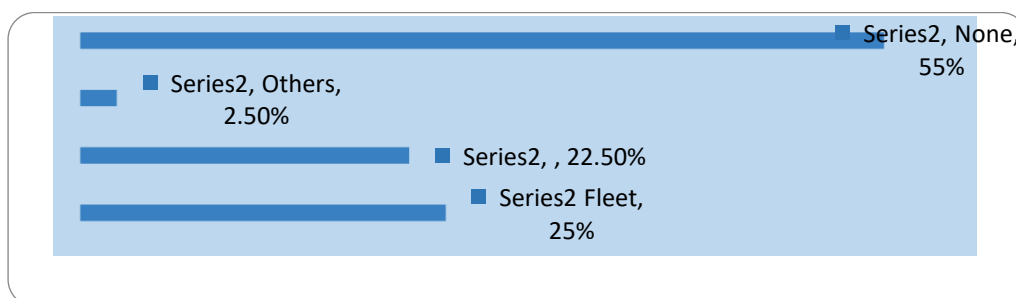
**Figure 6: Logistics experience before joining current department (Source: The author’s fieldwork)**

Despite starting in logistics without prior experience, individuals may have opportunities for career growth and advancement within the field. Continued learning, gaining hands-on experience, and demonstrating proficiency in logistics operations could lead to further career opportunities within the organization or the broader industry.

In summary, the data highlights that a significant proportion of individuals entered logistics roles within their current department without prior experience. However, through on-the-job training, leveraging transferable skills, organizational support, and ongoing learning, they were able to adapt and succeed in their new roles within the logistics domain.

**Training on Transport Maangement:**

The findings ( figure 7) show that 55% of the respondents don’t have any type of training on Transport management, while 25% , 22.5% and 2.5% respondents have training on Fleet , Maintenance and others respectively. It reveals that majority of the respondents don’t have training on transport management.



**Figure 7: Training on Transport Management (Source: The author’s fieldwork)**

### **Lack of Training in Transport Management (55%):**

The fact that 55% of respondents don't have any type of training on transport management highlights a significant gap in knowledge and skills in this critical area.

Without proper training, individuals involved in transport management may lack the necessary expertise to effectively plan, coordinate, and optimize transportation activities. This could lead to inefficiencies, increased costs, and operational challenges within the logistics system.

Addressing this gap through training programs and capacity-building initiatives is crucial to improve the overall performance and competitiveness of the logistics sector.

### **Training in Maintenance (22.5%):**

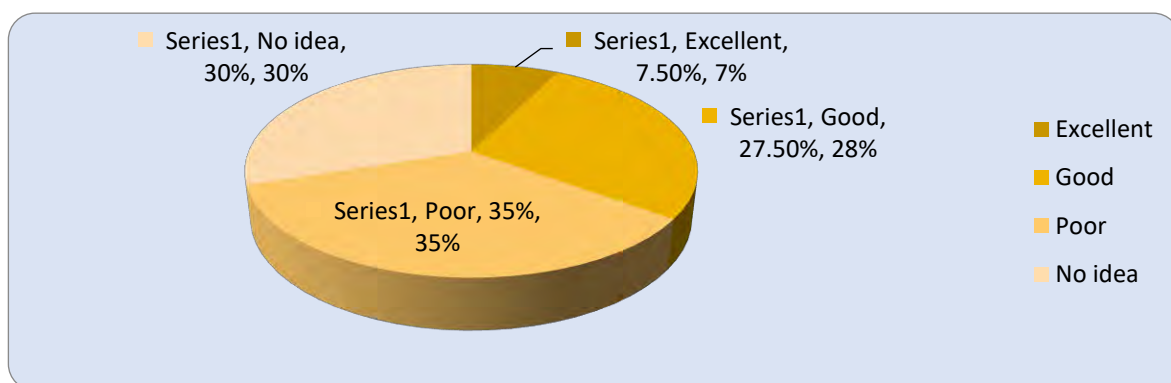
Similarly, 22.5% of respondents have received training specifically in maintenance, indicating a recognition of the importance of proper equipment upkeep and repair.

Maintenance training is critical for ensuring the reliability and safety of transportation assets, including vehicles, machinery, and infrastructure.

Adequate maintenance training can help prevent breakdowns, minimize downtime, and extend the lifespan of transportation equipment, ultimately contributing to smoother operations and cost savings.

### ***Knowledge level about Digital Transformations ( Personal perception):***

The respondents judged their own knowledge level about DT during the questionnaire survey which are presented in figure 8. 7.5% respondents opined that they have excellent knowledge level, where 27.5%, 35% and 30% respondents opined that their knowledge levels are “good”, “poor” and “no idea” respectively. It appears that knowledge level of 65% respondents are between “poor” and “no idea”.



**Figure 8 : Knowledge level about DT (Personal perception) (Source: The author's fieldwork)**

Highest Portion (Excellent Knowledge Level):

7.5% of respondents consider their knowledge level about digital transformation to be excellent.

This indicates a small but notable portion of respondents who feel confident in their understanding of DT. These individuals likely possess advanced knowledge and may have actively engaged in learning about digital transformation through formal education, training programs, or professional experience.

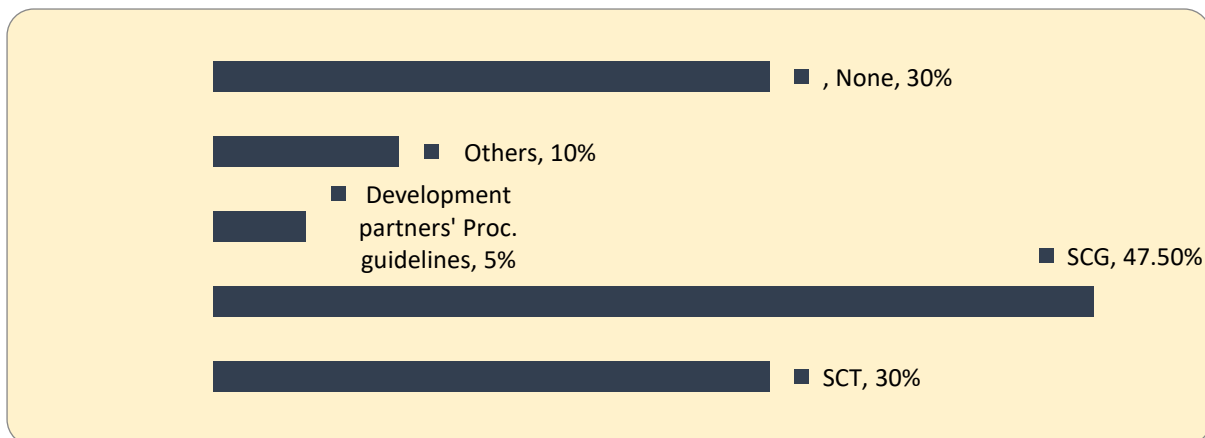
Lowest Portion (Poor to No Idea Knowledge Level):

A combined 65% of respondents rated their knowledge level as either "poor" (35%) or "no idea" (30%).

This represents the majority of respondents who perceive their understanding of digital transformation to be lacking or non-existent. These individuals may have limited exposure to digital transformation concepts, technologies, or strategies, or they may not fully appreciate the implications of digital transformation on their respective industries or roles.

**Training on Supply Chain Process:**

There are different documents/ guidelines used in the Supply Chain process whose knowledge is imperative to perform SCM activities efficiently. The FMCG sectors has prepared business process for its own operations in line with the organization’s needs.. The following figure 9 reveals that 30% of the respondents have training on SC process, while 47.5% and 5% respondents have training on SC guidelines of development partners respectively. 30% respondents don’t have any training on SC.



**Figure 9: Training on SC Process (Source: The author’s fieldwork)**

Analyzing the data from Figure 5.6 regarding respondents' training on supply chain (SC) processes and guidelines,

**SC Process Training - 30%**

30% of respondents have received training on supply chain processes.

This indicates a significant portion of respondents who have undergone formal training to understand and execute various aspects of supply chain management within their organizations. Individuals with SC process training are likely equipped with knowledge and skills related to inventory management, logistics, procurement, demand forecasting, and other critical aspects of supply chain operations.

These trained professionals may be better positioned to optimize supply chain processes, reduce costs, improve efficiency, and mitigate risks within their respective organizations.

### **No SC Training - 30%**

30% of respondents reported not having any training on supply chain processes.

This represents a sizable portion of respondents who lack formal training in supply chain management.

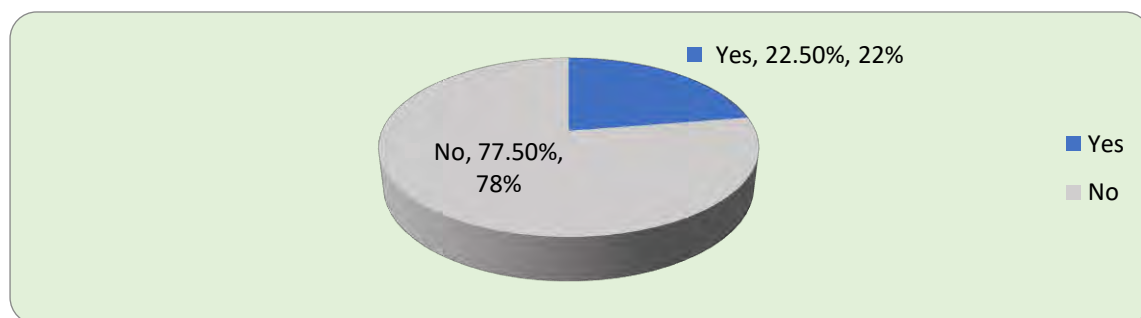
Individuals without SC training may face challenges in understanding and effectively executing supply chain activities, leading to inefficiencies, errors, and missed opportunities for optimization.

Without proper training, these professionals may struggle to adapt to changing market dynamics, technological advancements, and industry best practices, potentially hindering their organization's competitiveness and growth.

In summary, addressing the disparities in SC training is crucial for enhancing the efficiency, competitiveness, and resilience of the FMCG sector in Bangladesh. Investing in workforce development and training initiatives can empower employees to optimize supply chain processes and adapt to evolving market demands and challenges.

### ***Certified SC Professional:***

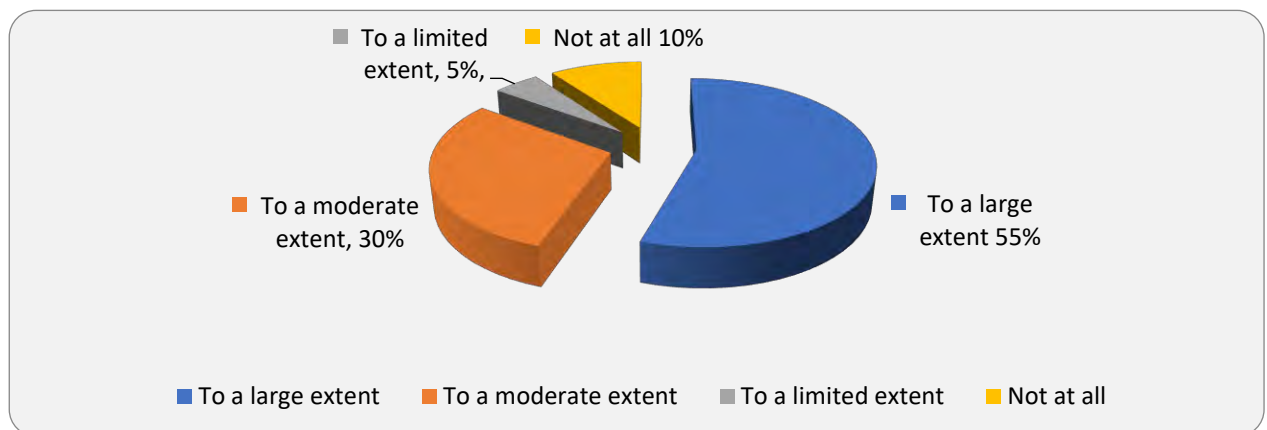
For DT implementation users need to have the certifications and knowledge. The following figure 10 shows that only 22.5% respondents have Certifications on SC while 77.5% don't have any Professional SC certifications.



**Figure 10: Certified SC Professional (Source: The author's fieldwork)**

***Interest to implement DT in FMCG sectors:***

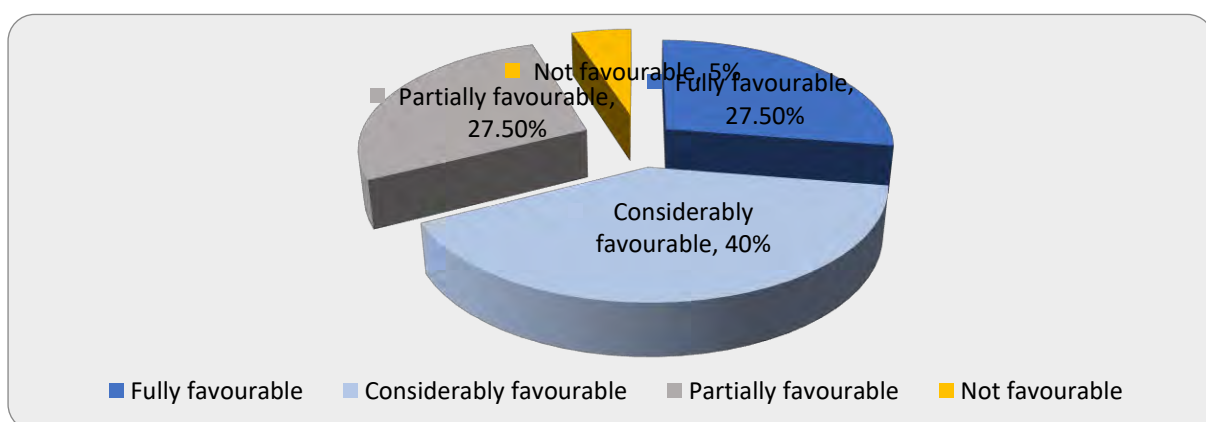
The respondents' opinion was sought on their interest to adopt DT in the FMCG sectors. Without employees' interest, it is very difficult to implement DT. It is revealed from the findings illustrated in figure 5.8 that majority of the respondents ( 55%) are interested to a **large extent**, 30% are to a **moderate extent**, 5% are to a **limited extent**. 10% respondents are **not interested at all**.



**Figure 11: Interest to implement DT in FMCG sectors.**  
(Source: The author's fieldwork)

***Managerial policies:***

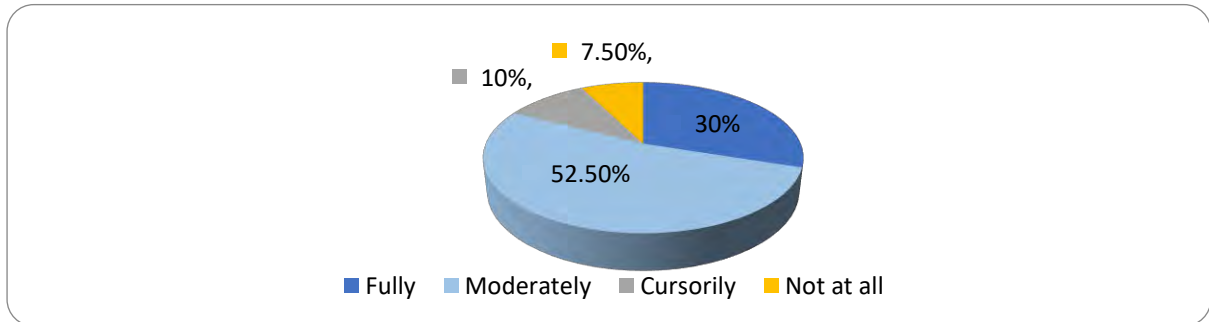
Favorable managerial policies play an important role in DT. The figure 12 represents the opinion of respondents regarding the managerial policies. 27.5% respondents have opined that managerial policies are “fully favorable” for DT implementation in the FMCG sectors where 40%, 27.5% and 5% respondents opinioned it as “considerably favorable”, partially favorable and “ not favorable” respectively.



**Figure 12: Managerial policies (Source: The author's fieldwork)**

**Management Commitment to upgrade DT:**

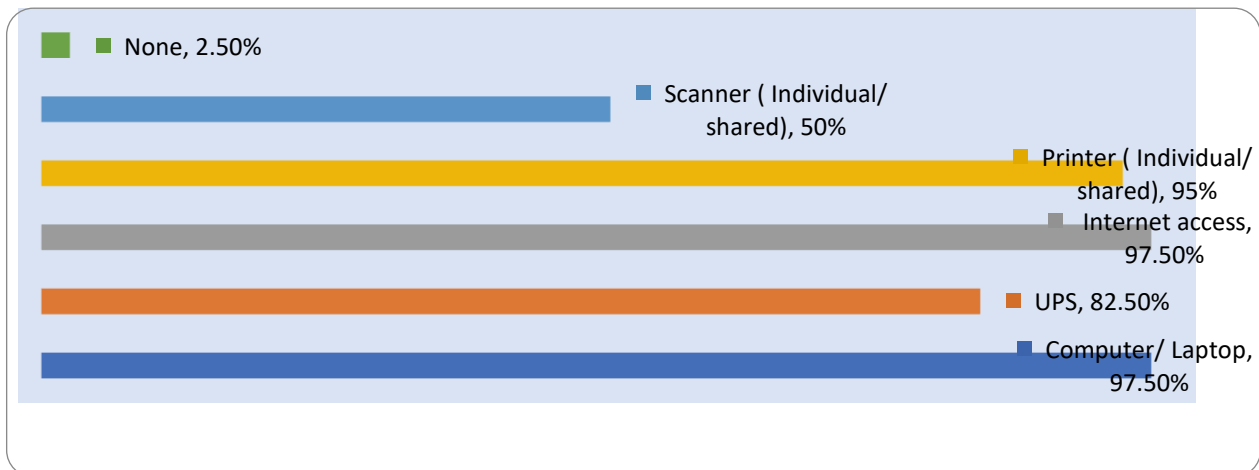
Support and commitment of top management are crucial for shaping organizational strategies and implementation. The respondents’ opinion was sought on the extent to which management is committed to implement DT. It is revealed from the findings illustrated in figure 13 that majority of the respondents ( 52.5%) considered management commitment as “moderate” while 30%, 10% and 7.5% respondents opined it as “ fully”, “ cursorily” and “ not at all” respectively.



**Figure 13: Management Commitment (Source: The author’s fieldwork)**

**Logistics support by the organizations:**

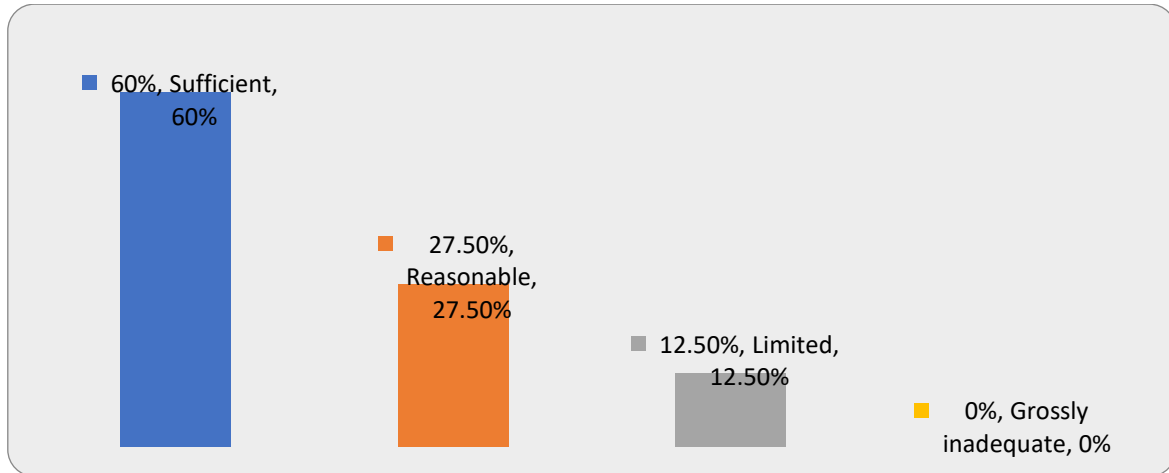
Without logistic support, DT implementation is quite impossible. The study reveals that 97.50%, 82.50%, 97.50%, 95%, 50% of the respondents have computer/ laptop, UPS, internet access, printer and scanner respectively. Only 2.50% respondents do not have any logistic support. The figure 14 is presenting the findings.



**Figure 14: Logistic support (Source: The author’s fieldwork)**

**Sufficiency of logistics support:**

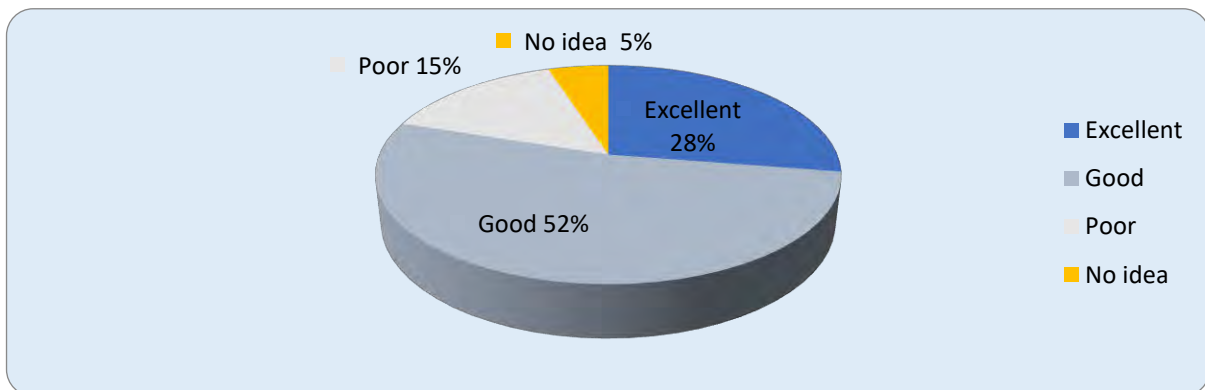
Logistics support is one of the most important prerequisites of DT implementation. The study presented in the figure 15 shows that 60% respondents believe that FMCG sectors level of logistics support is “sufficient” for DT implementation, while 27.5% and 12.5% respondents opined it as “reasonable” and “limited” respectively.



**Figure 15: Sufficiency of logistics support**  
(Source: The author’s fieldwork)

**Expertise in Digital Transformations (Personal perception):**

The respondents judged their Expertise level during the questionnaire survey which are presented in the figure 16. 27.50% respondents opined that they have “excellent” knowledge level, where 52.50%, 15% and 5% respondents marked their knowledge levels as “good”, “poor” and “no idea” respectively.

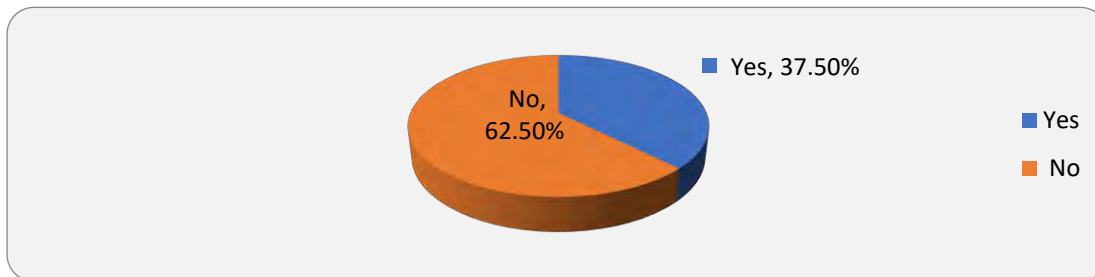


**Figure 16: Expertise (Personal perception)** (Source: The author’s fieldwork)



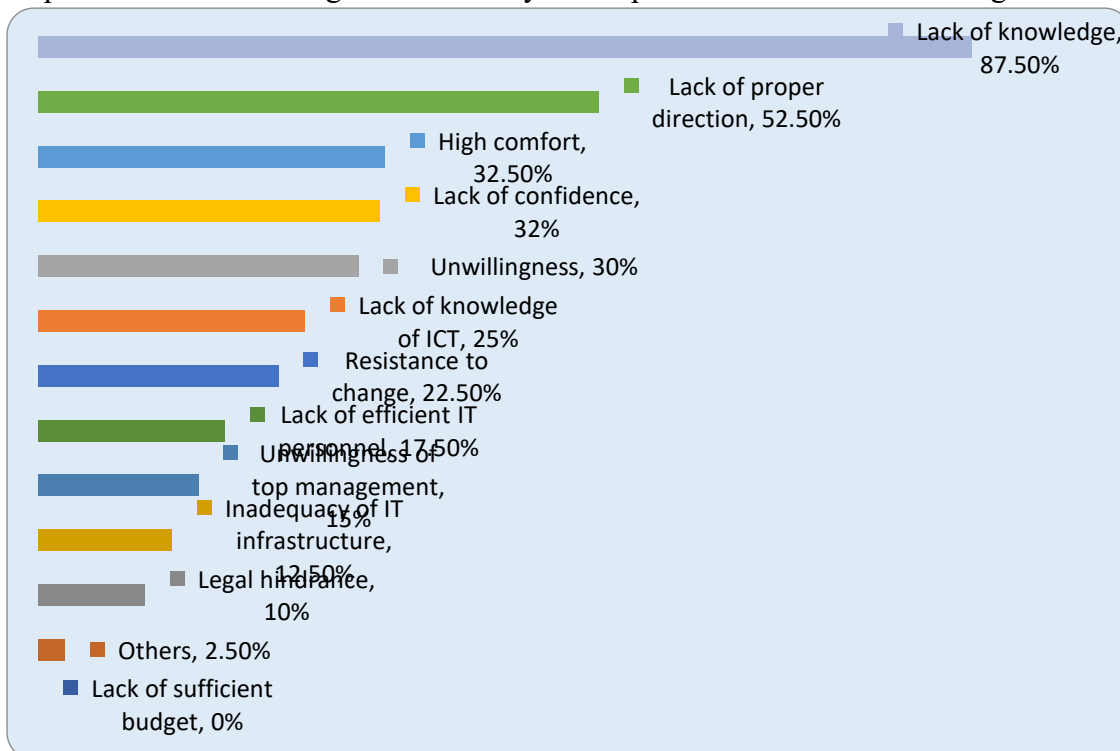
**Difficulties faced during upgradations and digital transformations:**

The FMCG sector while upgrading to digital transformations system since 2010. During the survey, majority of the respondents (62.50%) opined that they did not face any difficulty during upgradations in DT. 37.50% respondents opined that they faced some difficulties like existence of huge manual document/ work, lack of up gradation of system, time consuming, slow internet speed, ambiguity due to co- existence SC Process. Findings are presented in figure 17.



**Figure 17 : Difficulties faced during upgradations and DT (Source: The author’s fieldwork)**

**Challenges to upgrade to DT:** Respondent’s opinion was sought on the main challenges of Digital Transformations. Different challenges were identified by the respondents. Among them, the top most challenge was “lack of knowledge of SC” which was identified by 87.50% respondents. The challenges identified by the respondents are illustrated in figure 18.



**Figure 18: Challenges to implement DT in FMCG sectors (Source: The author’s fieldwork)**

## **5.2 Analysis of Digital Transformations Factors under the Study along with challenges:**

If we sum up the result of the questionnaire survey, face to face communication/ key informant interviews, the following observations are found in relation with the principal factors mentioned in the report:

**Digital Transformation in L&SCM:** Bangladesh can benefit from the adoption of digital transformation practices in logistics and supply chain management. By digitizing processes, creating digital representations of products and services, and leveraging data analytics, companies in Bangladesh can improve their efficiency and decision-making capabilities.

**Industry 4.0:** Industry 4.0 concepts, which involve the integration of Cyber-Physical Systems (CPS) and the Internet of Things (IoT) in industrial processes, can also be applied in Bangladesh's manufacturing and logistics sectors to enhance automation and connectivity.

**Customer Value:** Just like anywhere else, customer value is crucial in Bangladesh. Digital transformation can help companies in the country understand customer needs better, provide personalized services, and enhance the overall customer experience.

**Challenges and Opportunities:** Bangladesh, like many other developing countries, may face challenges in terms of infrastructure, data security, and upskilling of the workforce. However, there are significant opportunities for improvement by embracing digital technologies in the logistics and supply chain industry.

**New Business Models:** The integration of digital technologies can open up new business models in logistics and supply chain management in Bangladesh. For example, platform-based approaches and data-driven services can enable innovative solutions for last-mile delivery, inventory management, and demand forecasting.

**Increasing Flexibility:** Digital transformation can bring more flexibility and agility to supply chains in Bangladesh, allowing companies to adapt quickly to changing market demands and disruptions.

**Improved Visibility:** Enhancing visibility across the supply chain is crucial for Bangladesh, as it can lead to better coordination, reduced lead times, and improved overall efficiency.

**Data-driven Decision Making:** The availability of data and analytics can lead to data-driven decision-making in Bangladesh's logistics and supply chain industry, leading to better performance and optimized processes.

However, it's important to note that the successful implementation of digital transformation in logistics and supply chain management requires collaboration between industry stakeholders, government support, and a clear strategy for technology adoption.

In summary, the concepts of digital transformation, Industry 4.0, and customer-centric value propositions are relevant and applicable to Bangladesh's logistics and supply chain management landscape, and embracing these concepts can lead to significant improvements in the efficiency and competitiveness of the country's logistics industry.

**Customer Value and Expectations:** The desire for personalized products and experiences, as well as the importance of customer experience, is a global trend seen in many countries, including Bangladesh. As consumers become more digitally connected and aware, they are likely to expect companies to understand their needs and provide personalized services.

**Supply Chain Management in Bangladesh:** Like in many other countries, supply chain management in Bangladesh is evolving to meet customer demands and the changing global market. Companies are likely to adopt more customer-centric approaches, and the concept of bringing facilities closer to customers may also apply to certain industries in Bangladesh.

**Technology Adoption:** The impact of digital technologies on supply chain management and customer value is not limited to developed countries. As technology becomes more accessible and affordable, businesses in Bangladesh are also likely to leverage digital configurators, analytics, and other technologies to enhance customer experiences and optimize their supply chain processes.

**Customer-Oriented Key Performance Indicators (KPIs):** While many businesses in Bangladesh may already use traditional supply chain KPIs, incorporating customer-oriented KPIs and metrics that consider the customer experience can provide valuable insights and help create a competitive advantage.

### **5.3 Recommendations**

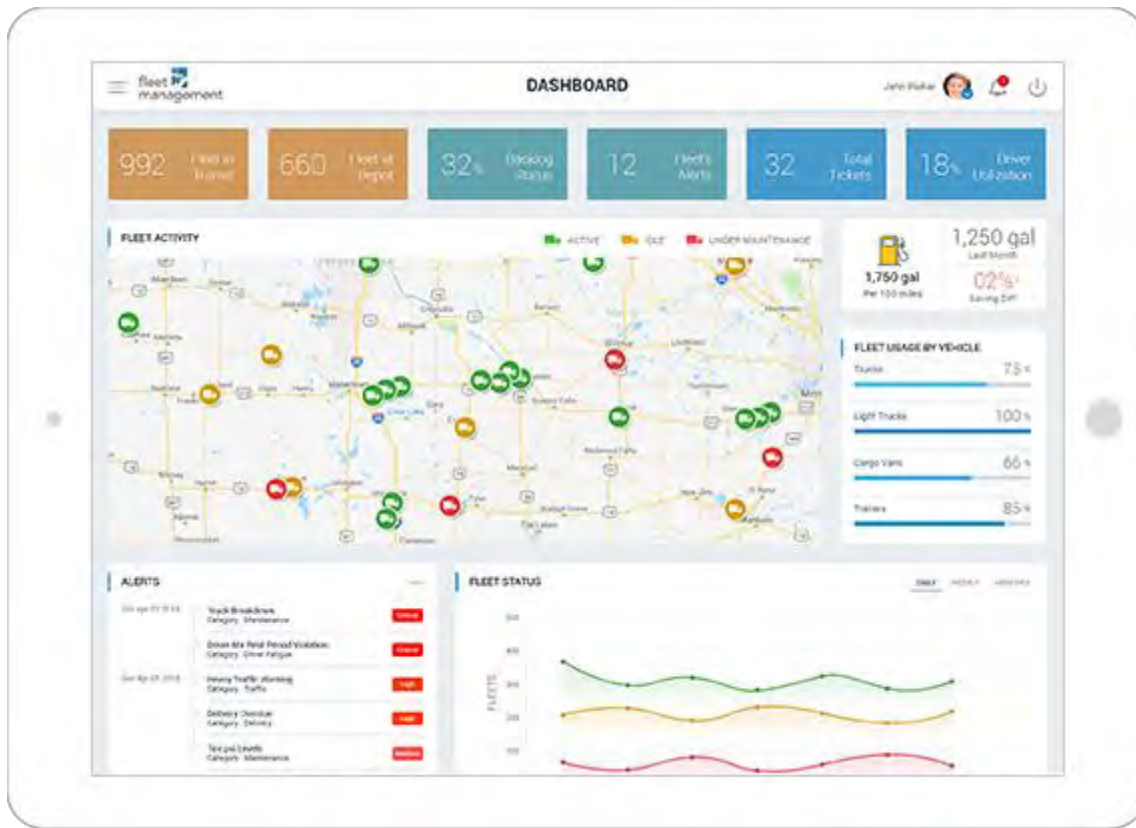
Invest in upgrading digital infrastructure, smart warehousing techniques, Fleet management, including internet connectivity and data networks, to enable seamless data exchange and communication between various stakeholders in the supply chain. This will ensure the smooth implementation of digital technologies and support data-driven decision-making. Develop robust data security measures and protocols to safeguard sensitive information throughout the supply chain. Companies should invest in cybersecurity technologies and employee training to mitigate the risks associated with data breaches and cyber-attacks. Initiate training programs to upskill the workforce and enhance their digital literacy. This will empower employees to adapt to new technologies and leverage data-driven insights effectively. Encourage collaboration and partnerships between logistics companies, manufacturers, retailers, and technology providers to share knowledge, resources, and best practices. Collaborative efforts can accelerate the adoption of digital technologies and lead to more innovative solutions. Advocate for supportive government policies and incentives that promote digital transformation in the logistics and FMCG sectors. Regularly assess the impact of digital transformation initiatives and make adjustments as needed. Continuous improvement is essential to ensure that the technology adoption aligns with business objectives and brings the desired outcomes. Policy and operational frameworks for digital transformation in standard organizations are crucial for ensuring that these entities can adapt to the changing landscape of technology and effectively fulfill their mandates.

Implementing logistics system upgrades for digital transformation in Bangladesh requires a comprehensive approach that addresses both technological and structural aspects. Here are some recommendations:

Overall, few recommendations to develop policy and operational framework for digital transformations in the standard organizations outlined as below,

### 5.3.1 Recommendations for Digital transformations upgradations.

#### SMART FLEET Management



**Figure 19: Fleet management dashboard.**

During data analysis, it has been found that major companies are using fleet management tools for real time tracking, vehicle movement analysis and to measure fleet cost.

Fleet management involves overseeing a company's vehicle fleet, including cars, trucks, vans, and other vehicles. Effective fleet management requires a combination of tools, techniques, and key features to ensure efficient operations, maintenance, safety, and cost-effectiveness. Here are some key features along with tools and techniques commonly used in fleet management:

**Vehicle Tracking and GPS Technology:** Real-time vehicle tracking using GPS technology allows fleet managers to monitor vehicle locations, routes, and speeds.

**Tools:** GPS tracking systems such as Geotab, Fleet Complete, and Verizon Connect.

**Maintenance Scheduling and Alerts:** Scheduled maintenance and proactive alerts for servicing help prevent breakdowns and ensure vehicle reliability.

**Fuel Management:** Monitoring fuel consumption, optimizing fuel usage, and detecting fuel theft or inefficiencies are crucial for cost management.

**Asset Utilization Optimization:** Analyzing vehicle usage patterns and optimizing asset utilization can help reduce idle time and improve efficiency.

By integrating these key features with appropriate tools and techniques, fleet managers can streamline operations, improve efficiency, reduce costs, and enhance overall fleet performance.

### **5.3.2 Recommendations for Digital Infrastructure and others development:**

Invest in robust digital infrastructure including modern warehousing concept, internet connectivity, network systems, and hardware to support the digital logistics platform. Encourage private sector participation in expanding digital infrastructure, including partnerships with telecommunications companies.

#### **Investment in Robust Connectivity Infrastructure:**

Allocate resources for improving internet connectivity and telecommunications infrastructure, especially in rural areas where connectivity is limited.

Data: According to a report by the International Telecommunication Union (ITU), Bangladesh ranked 148th out of 176 countries in terms of fixed-broadband subscriptions per 100 inhabitants in 2020.

#### **Adoption of Cloud-Based Technologies:**

Encourage FMCG companies to migrate their data and operations to cloud-based platforms to enhance scalability, accessibility, and data security.

Data: Research by IDC indicates that cloud spending in Bangladesh is expected to grow at a compound annual growth rate (CAGR) of 24.8% from 2020 to 2025.

#### **Implementation of IoT Devices for Real-Time Tracking:**

Promote the deployment of Internet of Things (IoT) devices for real-time monitoring of goods in transit, warehouse conditions, and vehicle performance.

Data: The global market for IoT in logistics is projected to reach \$31.9 billion by 2026, reflecting the increasing adoption of IoT solutions for supply chain optimization.

#### **Enhanced Data Analytics Capabilities:**

Provide training programs and incentives to develop data analytics skills among logistics professionals, enabling them to derive actionable insights from large datasets.

According to survey by the Bangladesh Bureau of Statistics found that only 23% of manufacturing companies in Bangladesh have a designated data analytics team.

**Integration of AI and Machine Learning Algorithms:**

Encourage the integration of artificial intelligence (AI) and machine learning (ML) algorithms to optimize route planning, inventory management, and demand forecasting.

According to a study by PricewaterhouseCoopers (PwC), AI is projected to contribute \$957 billion to the global economy by 2030, with significant benefits expected in the logistics sector. Implementing these recommendations can help propel the digital transformation of the logistics industry in Bangladesh, leading to improved efficiency, cost savings, and competitiveness in the global market.

**Last-Mile Delivery Optimization:**

Focus on improving last-mile delivery through route optimization, real-time tracking, and alternative delivery methods such as drones and autonomous vehicles. Partner with local delivery service providers to enhance coverage and efficiency.

**Supply Chain Visibility and Transparency:**

Enhance supply chain visibility through real-time tracking and tracing of goods using digital technologies. Increase transparency by providing stakeholders with access to relevant supply chain data while ensuring data security and privacy.

**Regulatory Framework and Policy Support:**

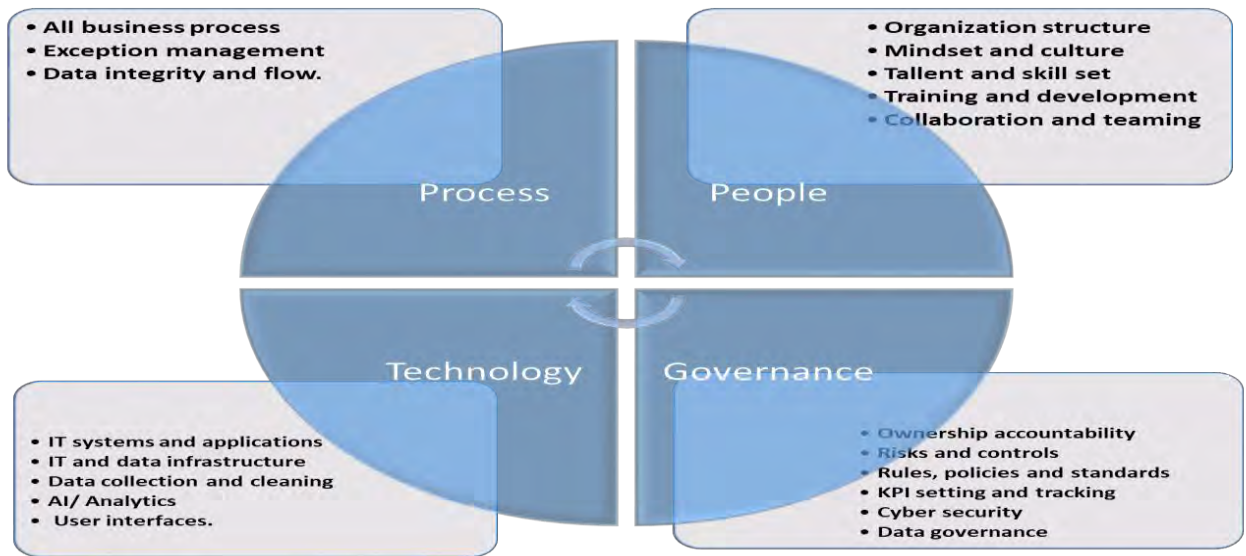
Develop supportive regulatory frameworks that encourage investment in digital logistics infrastructure and innovation. Provide incentives such as tax breaks or subsidies for companies adopting digital logistics solutions.

**Continuous Evaluation and Improvement:**

Establish mechanisms for monitoring the performance of digital logistics systems and collecting feedback from stakeholders. Continuously evaluate and refine strategies based on feedback and emerging technologies to ensure the effectiveness and relevance of logistics system upgrades.

By implementing these policies and processes, Bangladesh can significantly enhance its logistics capabilities, improve efficiency, reduce costs, and better position itself in the global market.

### 5.3.2 Recommendations for Policy developments



**Figure 20: Policy development process (Source the Author's own)**

Develop policies and guidelines governing various aspects of digital transformation, including data governance, cybersecurity, privacy, and technology procurement. Ensure that policies are compliant with relevant regulations and standards, such as GDPR, ISO 27001, and industry-specific standards.

### 5.4 Conclusion

In conclusion, the prospects for digital transformation in Bangladesh's logistics and supply chain management sectors, particularly within the fast-moving consumer goods (FMCG) industry, are promising yet complex. Embracing digital technologies offers substantial opportunities for enhancing efficiency, customer experiences, and overall performance. However, navigating this journey requires addressing challenges such as infrastructure limitations and data security concerns.

Collaboration among stakeholders, investments in digital infrastructure and cybersecurity, upskilling the workforce, and prioritizing data-driven decision-making are crucial steps for success. Moreover, it's essential to acknowledge Bangladesh's unique business landscape, considering factors like digital literacy, technological resources, regulatory environment, and customer preferences.

In the FMCG industry, digital transformation enables companies to better understand and cater



to customer needs, streamline operations, and stay competitive. While challenges exist, such as infrastructure limitations and data security concerns, leveraging enablers like government support and collaboration can facilitate successful implementation.

Key success factors include scalability, real-time tracking, data-driven decision-making, integration, automation, and a customer-centric approach. By addressing challenges, capitalizing on enablers, and focusing on these success factors, Bangladesh can unlock the full potential of digital transformation, leading to a more agile, competitive, and resilient supply chain ecosystem.

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**Questionnaire For Thesis: Digital Transformations in Logistics Operations: Challenges, Enablers and Success Factor Perspective of FMCG Industry in Bangladesh**

This questionnaire has been prepared for the purpose of thesis project as partial requirement of Masters in Procurement and Supply Management (MPSM) program run by the Brac Institute of Governance & Development (BIGD) of Brac University, and will be used only for academic purpose. Respondents' anonymity will be ensured.

Thank you in advance for your co –operation.

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( Please ✓ or write, as appropriate)

1. Please identify yourself:

Name of the respondent:

Gender:

Age:

Educational Qualification:

Designation:

Name of section & department:

Phone/ Mobile:

E- mail:

2. Please mention the years of working experience in SC/ Logistics Operations?
  - Above 6 years
  - 3-6 years
  - Below 3 years
  - None
  
3. Do you have any experience of DT before joining current department? ( If yes, please specify the duration)
  - Yes ( Duration:.....)
  - No
  
4. Do you have experience of Logistics transformations? ( If yes, please specify duration for **all types**)
  - Ordering (Duration :.....)
  - Fleet management (Duration.....)
  - Others (Please specify with duration :.....)
  - None
  
5. Do you have training on any Transport management? (If yes, please specify duration for **all types** of training).
  - Maintenance (Duration :.....)
  - Tracking devices (Duration :.....)
  - Others (Please specify with duration :.....)
  - None
  
6. How would you judge your own knowledge level about DT (Personal perception):
  - Excellent
  - Good
  - Poor
  - No idea

7. Do you have training on SC Process? ( If yes, please specify duration for all types of training)

- Logistics (Duration:.....)
- Warehousing (Duration:.....)
- Others ( Please specify with duration:.....)
- None

8. Are you a Certified Logistics Professional in Bangladesh?

- Yes
- No

9. To what extent you are interested to implement DT in FMCG sector?

- To a large extent
- To a moderate extent
- To a limited extent
- Not at all

Further comments

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10. Do you think that managerial policies favour implementation of DT?

- Fully favorable
- Considerably favorable
- Partially favorable
- Not favorable

11. To what extent management is committed to upgrade DT?

- Fully
- Moderately
- Cursorily
- Not at all

12. What type of logistics support do you have? ( Choose one or more options)

- Computer/ laptop
- UPS

- Internet access
- Printer ( Individual/ shared)
- Scanner( Individual/ shared)
- None

13. Do you think that current level of logistics of would be sufficient for DT?

- Sufficient
- Reasonable
- Limited
- Grossly inadequate

14. Do you agree that sufficient expertise is available with the organization to support and maintain the DT infrastructure?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

15. Do you face any difficulty during implementation of DT in your organizations? (If yes, please specify the reason.)

- Yes ( Please specify)
- No

Further comments

16. What are the main challenges to upgrade logistics system? ( You may choose more than one option that you consider relevant)

- Lack of knowledge of DT
- Lack of Knowledge of ICT
- Inadequacy of IT infrastructure
- Lack of efficient IT personnel
- Unwillingness of officials to transformations
- High comfort of present systems

- Lack of confidence
- Unwillingness of top management
- Lack of sufficient budget
- Lack of proper direction
- Legal hindrance
- Resistance to change
- Others ( Please specify)

17. If you have any suggestion towards improving readiness of adopting Digital Transformations in logistics operations, please mention here.