

A STUDY ON THE EXPANDING ROLE AND FUTURE POTENTIAL OF LIFE SCIENCE AND HEALTH SECTOR IN BANGLADESH'S LOGISTICS INDUSTRY

DHL Global Forwarding Bangladesh Ltd.

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Submitted in Partial Fulfillment of the Requirements for the Degree
Bachelor of Business Administration



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Internship/Project Report Approval Form

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INTERNSHIP/PROJECT INFORMATION

Internship

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Internship /Project Report Topic: **A Study On The Expanding Role And Future Potential Of Life Science And Health Sector In Bangladesh's Logistics Industry**

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Name: TAHIA ANJUM EMA

ULAB ID #212011038

Signature _____

Date 13th December, 2025

Letter of Transmittal

December, 2025

Shajedul Alam

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Subject: Submission of Internship report on “A Study On The Expanding Role And Future Potential Of Life Science And Health Sector In Bangladesh’s Logistics Industry”

Dear Sir,

With due respect, I would like to inform you that I have completed my Internship in DHL Global Forwarding Bangladesh Ltd. The research paper titled “**A Study On The Expanding Role And Future Potential Of Life Science And Health Sector In Bangladesh’s Logistics Industry**” has been prepared for the fulfillment of my internship according to the prerequisites of my undergraduate program Bachelor of Business Administration (BBA) in the University of Liberal Arts Bangladesh (ULAB). In this report, I have tried my best to compile the concepts which I have learned in my Bachelor of Business Administration along with my experiences and learning from the internship for taking relevant information regarding the internship and the industry. I hope that it will find your acknowledgment. I am looking forward to your valuable feedback.

Sincerely,

Tahia Anjum Ema

ID: 212011038

Bachelor of Business Administration (BBA); Concentration: Accounting

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University of Liberal Arts Bangladesh (ULAB)

Acknowledgement

I would like to address certain people with due honor and respect who assisted me not only to solve the challenge and complete my Internship Report but also to introduce me to this new situation without any trouble. Therefore, I'd like to express my gratitude to them. I am grateful to Almighty Allah for providing us with the patience and courage to complete this challenging task, within its deadline.

I am grateful to my supervisor, Shajedul Alam (Senior Lecturer, ULAB), for his advice and encouragement. He patiently provided valuable suggestions, motivation, and thoughtful assistance throughout my report submission process. My successful study would not have been possible without his support and diligent efforts. He has patience and understanding to me, even in times where I failed to keep my nerves calm from the pressure.

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I am grateful for the internet's ability to facilitate knowledge sharing and success in every domain. I collected all necessary data and documents for this report using the internet and Google.

I'd also like to thank my department line manager, Shahriar Habib (Head of Marketing and Sales, DHL Global Forwarding Bangladesh Ltd.) for his kind assistance with every element regarding my research.

Lastly, I am deeply thankful to my family and friends for their unwavering love, support, and encouragement. Their faith in me, particularly my parent's and my sister's constant encouragement throughout my undergraduate years at ULAB, has served as a guiding light.

Despite my limited experience, I attempted to write a compelling and insightful report that was infused with genuine understanding. Their unwavering support has truly been the foundation of my journey and achievements

List of Abbreviations

Abbreviation	Full Form
DGF	DHL Global Forwarding
DGF BD	DHL Global Forwarding Bangladesh
LSH	Life Science and Health
SQL	Structured Query Language
OFR	Ocean Freight
AFR	Air Freight
CFS	Container Freight Station
FCL	Full Container Load
LCL	Less-than Container Load
M&S	Marketing and Sales
QS	QuoteShop
RFQ	Request for Quotation
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning
WB	World Bank
WTO	World Trade Organization
API	Active Pharmaceutical Ingredients
LDC	Least Developed Countries
US FDA	United States Food and Drug Administration
US MHRA	United States Medicine and Healthcare Regulatory Agency
3PL	Third-Party Logistics
IoT	Internet of Things
AI	Artificial Intelligence
DGDA	Directorate General of Drug Administration
WHO	World Health Organization
BIDA	Bangladesh Investment Development Authority

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Part A

Chapter 01: Preparation of Internship.

1.1 Motivation and what I will learn during this internship.

My major has been Accounting and I have studied it in the department of Bachelors in Business Administration (BBA) in the University of Liberal Arts Bangladesh. My hands-on experience in Marketing is also diverse, as I have participated in many co-curricular activities, my various part-time employment experiences, and various competitions like HULT Prize (On-Campus Program) 2024 25. I was keen on putting my creative and analytical abilities to an internship that would turn these abilities into concrete ones, which would be applicable in the performance of any duty in the business environment. I wanted to have an internship which would improve my skills and enable me to learn and develop. Another aspect that is worth bringing up is that my wish was to have a dynamic, as opposed to a static, internship which I believe would provide me with more learning and development opportunities.

1.2 Job Hunting during Internship.

It is not a secret that the employment market of Bangladesh is highly competitive and the market is overflowed with fresh graduates and the quantity of jobs available is almost minimal. That is why I chose that in order to shine out among the crowd of applicants, I must enhance my list of skills, learn how to network and apply to jobs correctly, learn some tricks and secrets of landing a job more successfully and refine my speaking and interviewing abilities. Consequently, I decided to take various courses online and acquired Data Analytics, Python, SQL, Critical Thinking, etc. I ensured that I was active on LinkedIn, and other job portals where I could accidentally come across the good offers as soon as possible. In all these applications, I had one thing that was common, I could qualify of the final round of interview but failed to clear the interviews. It is here where I chose to identify my weakness and sharpen it, in such a way that I was not being stunted in achieving my dream internship.

On LinkedIn, I came across the advert that was announcing the Internship Program of DHL Global Forwarding Bangladesh. I soon applied to it and wrote a Cover Letter that I sent to the application portal of their company, together with the CV.

1.3 Experiences of the internship interviews.

Having been applying to the Internship Program at DHL Global Forwarding Bangladesh, two and half weeks later, I was called to the Head Office of DHL Global Forwarding Bangladesh at Banani, to take part in the interview process. The people in the office were also warm and hospitable as I entered the office. The Manager of Ocean Freight Department and Manager of

IT of DHL Global Forwarding Bangladesh were interviewed to conduct my interview. Although, my interviewers belonged to the superior ranks, they were very accommodating and warm towards me. They questioned me of my CV questions, and out of my CV, scrying my personal life and general personality. The interview was balanced both in terms of professional questions and the situational questions. The interview lasted a duration of over 40 minutes and due to their friendly attitude, I was not intimidated or nervous in the interview. It showed that they did care about picking the best candidates available in their internship program and that they did want to know me as a person and not as a candidate. Having presented such a good interview, I was optimistic and was hoping that I will be selected and get a chance to work in such a positive atmosphere amid such helpful people.

1.4 About the Organization

DHL Group is a merger of DHL and Deutsche Post. Their services are offered globally - letter and parcel delivery, express shipping, freight transport, integrated supply chain management and e-commerce. DHL Group has their Corporate Center (Board departments, Human Resources and Finance) in Bonn, in Germany, and our operating business is managed by their five company divisions. Their service provider is Global Business Services and Customer Solutions and Innovation that centralises key account management and overall Group innovation activities.

DHL Global Forwarding Bangladesh (DGF BD) is the Freight Forwarding Division of the DHL Group that handles Ocean Freight and Air Freight. DHL Global Forwarding operation in Bangladesh revolves around assisting the nation of Bangladesh which has a massive garment production sector with a high level of Container Freight Station (CFS) services especially in Chittagong. Recent investments such as a large EUR 2 million expansion have made CFS facilities green such as use of electric forklifts and under the GoGreen Plus solution they could use sustainable marine fuel so as to reduce carbon emissions and the increasing demand of ready-made garments.

Core Products/Services:

Standard Air Freight

Time-Sensitive Air Freight

Specialized Solutions

Full Container Load (FCL) Ocean freight.

Less-than-container Load (LCL) by Ocean Freight.

Ocean Express that is temperature controlled.

Non-Containerized Load

Multimodal Transports

Customs Services

Value Added Logistics

Sustainability Solutions

DHL Global Forwarding Bangladesh (DGF BD) is pegged on its four main values; Teamwork, Entrepreneurship, Excellence and Passion. And DGF BD has four 2030 goals which are to become: Employer of Choice, Investment of Choice, Green Logistics of Choice and Provider of Choice.

1.5 Mission

The mission of DHL Global Forwarding is to bridge individuals and companies in the world, offering them a stable, innovative and sustainable logistics up to the task. Their objective is to facilitate commerce, serve economic advancement and enhancement of existence by superiority in freight forwarding and supply chain services.

1.6 Vision

The vision of DHL Global Forwarding is to be known as the logistics company of the world, Investment of Choice, Provider of Choice, Employer of Choice and Green Logistics of Choice. They have a vision of being the best quality and customer satisfaction and environmental responsibility in the industry, as well as being a driver of innovation and value creation to the stakeholders. Employer of Choice DGF BD has won Top Employer 2024 in Bangladesh, Top Employer 2024 in Asia Pacific, and Top Employer 2024 Global.

Chapter 02: Introduction to the Internship.

2.1 Department activities and duties.

The initial 3 days of my internship was the induction phase where all the departments of DGF BD presented themselves, their departments and operations and workflow to all the interns. During the third day, we were given our departments and I have been allocated the Marketing and Sales (M&S) Department of DGF BD. The M&S department is mandated to take in new business into DGF BD and continue on-churning new shipments with the current clients. They also do the branding and advertising of DGF BD.

2.2. Work Environment of DGF BD

DHL Global Forwarding Bangladesh is a workplace with a dynamic positive and inclusive work culture in which collaboration is the core element. The environment also promotes open communication, respect, and teamwork and thus, employees feel empowered and valued. The high cross-team functionality is one of the most powerful points of the culture, teamwork in the departments is made smoothly to meet shared objectives, which makes it efficient and innovative. My peers and superiors are very accommodating and friendly, which makes them feel like they belong and have the trust to be the best in what they do. This favorable environment does not only boost productivity, it also facilitates life-long learning and professional development.

2.3 M&S Intern Duties and responsibilities.

- Create QS rate quotes on RFQs and confirmed consignments with custom rates - Quoteshop (QS) is a system based on DHL where we key in the import/export lanes, customer requirements, and others to create the rate at which the business is to be offered and carry out. The names and terms of the charge codes (additional charges like taxation, pickup-dropoff fee, etc) should be known to be able to learn and use the system efficiently.
- Prepare the branding materials and goods to be manufactured next year - the goods that are to be manufactured and distributed next year (2026) are designed by me, and both the Chief Finance Officer (CFO) and the Country Manager (CM) approved it.
- Monitor reverse auction bids of shipments to be emailed to customers and clients of DGF BD usually have reverse auction bids on their scheduled shipments and email the bidding link to the email of their forwarders. The bid will be to establish the lowest practically achievable bid rate so that it will be able to win the shipment.
- Liaise with the Senior Ocean Freight Commercial Centre (OCC) Specialist on the appropriate rates of the bid and get involved in the bid to win the shipment.

- Email approved rates to send to the clients and communicate with them.

2.4. Educational Learning Application in the Internship.

Throughout my internship at DHL Global Forwarding Bangladesh as an M&S Intern, I was able to apply my academic knowledge to the business world:

1. **Marketing Management:** The aspect of segmentation, targeting and positioning helped me to gain insight into the customer base of DHL and help me in designing specific marketing strategies. I also participated in promotions and market trends analysis to aid in decision-making, and this was under the guidance of my line manager.
2. **Customer Relationship Management (CRM):** I used CRM concepts through observation and support of the processes that affect good client relationship. This involved customer analysis, quality of service and knowing how data-driven tools are used by DHL to increase customer satisfaction.
3. **Accounting and Finance:** I have learned a lot about financial statements and cost analysis which has helped me to interpret the pricing structure and the role of revenue and expenses in profitability. I also got to understand the impact of financial considerations in the marketing and sales decisions.
4. **Taxation:** I got to know about compliance rules involved in international trade and logistics and how taxation policies impact pricing and service provision in freight forwarding.
5. **Economics:** I used economics concepts to understand market forces, global trade patterns and the impact of macroeconomic forces such as currency fluctuations and fuel prices on the cost of logistics and demand.

Such combination of theory and practice has enhanced my analytical behavior and provided me with a comprehensive perspective of the operation of marketing and sales in a global system of logistics.

Chapter 03: Self Reflection

3.1 Feedback on the Internship

In my reflection on my internship in DHL Global Forwarding Bangladesh, I am indeed grateful to the lessons learned and professional development that I got over the course of the internship. The possibility to use my academic knowledge in practice, in a business situation, was the most rewarding part. I got practical exposure in different fields of marketing and sales, such as the work with prospective clients, helping them in creation of marketing material, and working with highly functional cross-team units. These experiences enabled me to appreciate how global logistics makes sense in the marketing strategies to create values to customers.

Together with these accomplishments, I have encountered a few difficulties that have challenged my flexibility and ability to solve problems. The challenge to overcome these barriers assisted me in becoming a resilient person and gaining a greater insight into the intricacies of international freight forwarding and customer relationship management.

One of the greatest challenges, in such a fast-paced environment of the startup, where time limits are tight, and priorities often change, is navigating. Adapt to this changing environment, demanding flexibility and effective time management, managerial skills. More so, managing multiple commitments, i.e. sales presentations, product development, etc was at times challenging and demanded meticulous prioritization and delegation.

Though these challenges occurred, I believe that they played a significant role in my career and personal life.

growth. The challenges helped me to overcome them and to learn how to solve the problems.

importance of adapting and enduring adversity. Moreover, the constructive

I could also identify areas of improvement, courtesy of the feedback provided to me by my mentors and colleagues and implement the plans of self-development and continuous learning.

3.2 Recommendation

The company can also provide alignment and maximize efficiency through providing me accurate instructions on roles, responsibilities, and expectations. My career and work goals would enable me to advance in the company in case training programs and resources were available to help me acquire skills and competences that would be relevant in my work.

Chapter 04: Personal Development Plan.

4.1 Competency Skills, technical.

In order to improve my corporate skills, I will consider enrolling in a few online courses and practicing the following:

1. Data Visualization
2. CRM and ERP Systems
3. Digital Marketing tools
4. Project Management Tools (e.g. MS Project, Asana, etc.)
5. Developed Reporting and Excel.
6. Microsoft Office Advanced
7. Basic Coding and Automation

4.2. Interpersonal Skill Development

The enhancement of interpersonal skills is achieved by involvement in social gatherings, group discussions, and interaction with patients throughout treatment sessions.

In order to become a successful corporation, I have also listed the interpersonal skills that I would like to achieve step by step:

1. Teamwork and cross functionality skills - Corporates are driven on cross-functional projects; team player status renders you indispensable. I will strive to engage in team work, honor other views, and provide assistance actively.
2. Emotional Intelligence (EQ): Knowing and controlling your emotions and being able to empathize with others. EQ can be used to solve conflicts, be a good leader, and preserve good relationships.
3. Adaptability and Flexibility - Adaptability and flexibilities to changing priorities, technologies and work environments. Companies, particularly logistics is changing at a fast pace; flexibility keeps you afloat. To improve these competencies, I will seek to know how to embrace change, acquire new tools fast, and have a positive attitude towards change in the process.
4. Time Management - This is about ensuring that high priorities are given to tasks in order to avoid delays and at the same time maintain quality as far as corporates are concerned with efficiency and reliability.
5. Negotiation and Persuasion - It is about making decisions positively without losing professionalism. This can be applied in sales, marketing and cross-functional projects. My objective is to master the art of negotiation, train to be assertive, and learn the psychology of clients.

PART B

A study on the Expanding Role and Future Potential of Life Science and Health Sector in Bangladesh's Logistics Industry

Chapter 1 - Introduction

1.1. Background of the Study

Bangladesh has been transformed into a low-income, agriculture-based nation to the fastest growing economy in the Southeast Asia and among the fastest growing economies in the world. One of the major aspects of this increase is due to the rapid urbanization in Bangladesh whereby the individuals residing in the urban area has multiplied by 4 folds in 1972 to over 40 percent in 2025. The Life Science and Health Sector (LSH) is one of the rising industries of Bangladesh with an impressive technological foundation and contribution to the expanding economy of the country. The total LSH market in Bangladesh is estimated at USD 14 Billion in 2025 and is expected to continue climbing to USD 23 Billion USD in the year 2030 due to the rising demand, purchasing power as well as rising middle class.

The pharmaceutical industry of Bangladesh is one of the best branches of LSH. The pharmaceutical industry in Bangladesh has been able to convert into an industry characterized by heavy imports to an export-oriented powerhouse. It is the most technologically developed manufacturing industries of the country and it is contributing 1% of the total GDP of the country. Since 1982 with the National Drug Policy, the pharmaceutical industry has thrived with local manufacturers in mind. The waiver of Trade Related Intellectual Property Rights (TRIPS) on the LDC (Least Developed Countries) by the World Trade Organization has benefited the industry. The pharmaceutical sector in Bangladesh sells its products such as high technology medicines such as oncology drugs, hormones, injectables among others to more than 150 countries around the world. Local manufacturers have been almost self-sufficient by reducing 98% of the total medicinal demand in the country. A significant portion of this success has been due to the ability to reverse-engineer patented generic pharmaceutical products, which was waived by the World Trade Organization (WTO) of least developed countries (LDCs).

The industry is expected to continue with its rising trend, with the focus on the local manufacture of active pharmaceutical ingredients (APIs) in order to reduce the degree of dependency on imports. As leading Bangladeshi firms are exporting generic drugs to over 150 countries including very regulated markets in USA, UK, and EU, the industry is no longer an import substitution industry, but it is a huge exporter. The pharmaceutical industry has become the second largest earner of foreign exchange in the country thanks to its rapid expansion. Research and development spending is also increasing to enable the company to grow in the long term. In Bangladesh, pharmaceutical industries have created a well-trained manufacturing facility with the latest technology that produces complex drugs such as

hormones, insulin, and anti-cancer drugs. Most of the local major companies including Square, Incepta, and Beximco have been certified by leading international regulating bodies such as the US FDA and UK MHRA.

1.2. Problem Statement

New challenges are emerging in the industry with Bangladesh willing to abandon LDC status which includes a change in the intellectual property rights. However, it focuses more on R&D and strategic planning as well as regulatory improvements to sustain its global competitiveness. The major challenges are poor infrastructure, lack of proper cold chain logistics, excessive out-of-pocket healthcare costs, and the issues of the complexities of the last-mile logistics delivery, particularly in rural location.

Lack of good transportation systems in rural areas makes medical supplies transportation more difficult particularly during unfavorable weather conditions. Moreover, lack of storage facilities causes wastage and medical commodities and supplies stock out. Most health institutions are poorly furnished, and they do not have basic facilities such as clean water, which is important in ensuring medical equipment and supply integrity.

Low-quality temperature regulation poses difficulties to storing and preservation of vaccines and temperature-sensitive products, particularly in the areas that are remote and have low-quality electricity and working storage. The lack of cold chain point results in logistical gaps, and inefficient transportation systems result in the medical staff adopting inadequate and dangerous medical transportation systems that reduce supply effectiveness.

About 66 percent of the expenditures on healthcare in Bangladesh are out-of-pocket, and this poses a huge financial burden that constrains access to the much-needed healthcare services, especially to poor and marginalized populations. Also, the absence of a comprehensive healthcare insurance system and the dependence of the healthcare system on the private funding led to heightened healthcare disparities among different income groups of Bangladesh.

Poor road networks in access to remote areas to deliver health services are hindered by monsoons and other related complications that require other severe means of transport such as boats, ferries etc., and also insecurity in some areas will discourage health workers and distribution of medical supplies.

1.3. Research Questions

What do the existing logistics play in present LSH sector in Bangladesh?

What are the main issues facing efficiency and effectiveness of LSH logistic in Bangladesh?

What are the companies that ship LSH to Bangladesh?

Which are the primary trends and technological changes and developments that may revolutionize the LSH logistics of Bangladesh?

What is the future potential for LSH Logistics to drive growth and improve healthcare outcomes in Bangladesh?

1.4. Thesis Statement

The paper submits that the large and consistent growth of the global life science and health (LSH) sector is essentially revolutionizing the logistics industry. This growth creates a special need and strategic chance to the upcoming economy like Bangladesh to modernize the national logistic structures and infrastructure. This research paper believes that the inability to strategically invest in specialized infrastructure, advanced technology and skilled human capital not only will not facilitate the achievement of significant economic growth but also will be a disaster to the health outcomes of a nation because it will undermine the effective and reliable access to the much-needed medical supplies.

1.5. Scopes and Limitations

Particular areas that will be addressed in the context of Bangladesh in the research are:

Primary Sector of Bangladesh - The Study will examine the relationship between three important sub-sectors of the life science and health (LSH) industry: Pharmaceuticals Industry - This entails the logistics on the sourcing of the raw materials, manufacturing, warehousing and the distribution of the medicines, both domestically manufactured and imported/exported. Medical Device Sector - The study will include the supply chain issues and supply chain logistics of the importation, storage and distribution of medical equipment, instruments, and supplies. Industry Logistics- The paper will analyze the competencies, infrastructure, and specialized services, offered by the logistics providers (3PLs among others) that can meet the special needs of the health sector of Bangladesh.

Geographical Scope - The whole research will be limited geographically to the territory of Bangladesh only.

Role Examination - The paper will mostly explore the growing role and changing interaction of health sector and logistics industry with special reference of the recent trends and drivers of growth.

Limitations: What is not going to be discussed.

Other Healthcare Sectors: The other related health related areas like nutraceuticals, cosmetics, or traditional/herbal medicines will not be deeply discussed in the research, unless

they have a very strong overlap with the pharmaceuticals or medical devices supply chain.

Non-logistic Business Functions: Although they are recognized to be part of the larger industry, the study will not be an inquiry into the non-logistics factors such as marketing strategies, R&D processes, clinical trials or regulatory approval of the health products except in terms of their effect on the logistics requirements.

Global/international Context (Beyond Imports/Exports): It will be focused on domestic market and supply chain of Bangladesh. The effect on a wider scale of international logistics (e.g., the global shipping lane analysis, international trade agreements that are not specific to Bangladesh will not be discussed directly but only as it has a direct effect on imports and exports to Bangladesh.

Limitations: Research Constraints.

The inherent limitations that are recognized as a potential constraint to the research include:

Dependence on Secondary Data: The research will be majorly dependent on publicly available information, reports on the industry, scholarly materials and information provided by the government. The accessibility, stability, and specificity of this secondary data to some nice sub-sectors in Bangladesh (e.g., certain types of medical devices) might become a weakness.

Data Timeliness: Global supply chain industries and regulatory environments evolve too fast, such that the findings are based upon the data that was available during the research time and can need the latter updates.

Qualitative vs. Quantitative Balance: Availability of accurate quantifiable data on the logistics measures in the Bangladesh logistics sector may affect the balance between qualitative and quantitative analysis of the trends in the industry.

Chapter 2 - Literature Review

2.1. Healthcare Logistics Trends in the World.

With the emergence of biopharmaceuticals, personalized medicine, and digital health technologies, the global healthcare logistics market is also experiencing a great deal of transformation. There has been a surge in demand of temperature sensitive products like vaccines and biologics that have fuelled the necessity of cold chain logistics that is expected to hit USD 21 billion by 2030 (Biocair, 2025). Such sophisticated solutions as IoT-based monitoring, blockchain traceability, and AI-based prediction are becoming the norm to guarantee the integrity and adherence of the products to the international regulations (DHL, 2025). Global actors are equally exploring green logistics and multimodal transportation as a way of minimizing carbon footprints without compromising on the high quality services (Mostafa, 2025).

2.2. Healthcare and Logistics Condition in Bangladesh.

The healthcare industry in Bangladesh is growing at an alarming pace, and 607 governmental hospitals, and more than 5000 private clinics generate a high level of demand in terms of effective logistics (Haider, 2023). Pharmaceutical sector fulfills 98 percent of medicine demands in the country, and is exported to over 150 nations making Bangladesh a generic drug center in the region (The Daily Star, 2025). Nonetheless, 90 percent of Active Pharmaceutical Ingredients (APIs) are imported, which exposes the supply chain to disruptions on the global scale (Rayhan, 2025). Though this has been growing, logistics infrastructure in the healthcare sector is undeveloped especially in cold chain capacity that is critical to vaccines, biologics, and other clinical trial material. Organizations such as Transmove and Yusen Logistics are also rolling out GPS-based monitoring and refrigeration that does not consume excessive energy to streamline the industry (Mostafa, 2025; Yusen Logistics, 2025). Market trends indicate that cold chain logistics is going to grow tremendously by 2030, aided by biopharmaceuticals and healthcare exports.

2.3. Life Sciences Supply Chain Management.

Life sciences theoretical frameworks of Supply Chain Management (SCM) focus on the cold chain logistics, just-in-time (JIT) inventory systems, and strategically aligned relationships with vendors. Cold chain management guarantees the safety of the product to temperature-sensitive pharmaceuticals, whereas JIT decreases holding costs and waste (DHL, 2025). The vendor relations are also important to stay on track and deliver the APIs and finished products on time, particularly in the emergent markets such as Bangladesh where reliance on imports is elevated (Rayhan, 2025). The combination of predictive analytics and digital SCM platforms is regarded as one of the most popular practices in the world, as it allows creating a real-time view and preventing risks (Biocair, 2025).

2.4. Determining the Knowledge Gap.

Although the current literature discusses the development of the pharmaceutical industry in Bangladesh and the shortage of cold chain infrastructure, little literature is available regarding the potential of the Life Sciences and Healthcare (LSH) industry to trigger change in the logistics sector as a whole. In particular, the literature has not addressed how to integrate the best SCM practices, digitalization, and multimodal logistic centers to make Bangladesh a competitive entity in the global healthcare supply chains (ADB, 2025). This gap is an opportunity to conduct research regarding policy frameworks, technology adoption, and strategic partnerships that can be used to make systemic changes beyond healthcare logistics.

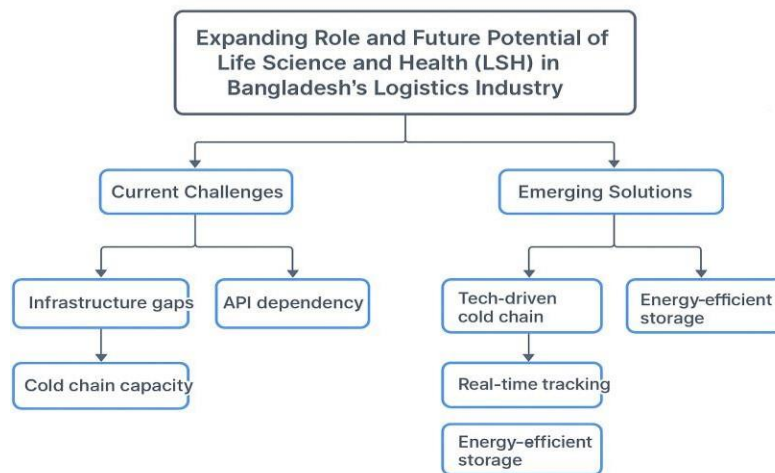
2.5. Variables Adopted in this Study

The variables (both independent and dependent) considered for the study are listed as follows:

Dependent Variable	Independent Variable (Drivers of Change)
Efficiency and Competitiveness of LSH Logistics of Bangladesh	Digital Transformation (IoT, AI Adoption, Blockchain, etc)
Regulatory Frameworks (DGDA Compliance, harmonized standards)	Cold Chain Infrastructure (temperature-controlled storage, Last-mile delivery, etc)
Economics Factors (healthcare spending, middle class growth)	Government Initiatives (API Industrial Park, Policy incentives, etc.)
Infrastructure Development (roads, transports, multimodal hubs, etc.)	Public-Private Collaboration (shared logistics platforms, partnerships)
	Technical Adoption (real-time tracking, energy efficient systems)

2.6. Conceptual Framework

The framework displays the impacts of the variables of public-private collaboration, cold-chain infrastructure, and digital transformation on the effectiveness and competitiveness of LSH Logistics in Bangladesh. The new solutions, including IoT-based tracking, energy-saving storage, and outsourcing are juxtaposed with the current problems, including an infrastructure gap, dependency on API, and limited cold chain capacity. This model focuses on the importance of LSH developments as a catalyst to transform the entire logistics sector as a whole.



Chapter 3 - Research Methodology.

3.1. Research Design

This type of research is exploratory in nature. In order to deliver the complete insight and prospect of the emerging role and future of the Life Science and Health (LSH) Sector of the Logistics Industry in Bangladesh, this research intends to employ both a literature review and a proposed qualitative data gathering, questionnaires and semi structured interviews of the stakeholders in the industry namely, the pharmaceutical companies, logistics providers and technology companies. They are supplemented by the analysis of secondary data in terms of market groups and policy documents. This approach will ensure triangulation of results by feeding on the macro-level trends, as well as micro-level operational understandings.

This study design is consistent with Grant et al. (2023) who pointed out that mixed-method research in logistics and supply chain management is more powerful in terms of making both theoretical and practical contributions to the investigation of complex, multidimensional phenomena as the model of the study. Most of the movie's scenes echoed the tensions I was going through then, thereby reminding me of the suffering arrows endure. The tensions that I was experiencing at the time were reflected in most of the scenes in the movie, which made me remember the suffering that arrows go through.

3.2. Sampling Technique and Determination of Sample size.

The researcher used non-probability purposive sampling method because the research is concerned about one particular group of professionals whose expertise on Life Sciences and Health Logistics (LSH). To suit the study, purposive sampling will be appropriate since random sampling would not be able to provide the specific kind of knowledge needed to conduct the study. (Etikan, Musa, & Alkassim, 2016).

The initial / actual sample size was 30 respondents, divided into several groups of stakeholders. Nevertheless, time limitation and lack of availability of respondents as planned led to the shortened sample size to 8 respondents: they were grouped as follows:

5 DHL Global Forwarding Bangladesh Ltd. employees (Sales, Operations, and Compliance Roles).

2 representatives of pharmaceutical companies.

1 delegate of logistics provider (CNC)

3.3. Semi-Structured Interview questions.

The questions in the interview were designed in a semi-structured format, which was informed by the research goals and themes that were found in the literature review. The design was to provide some consistency in the interviews, along with the flexibility to investigate some new insights. The following were the questions that were grouped into thematic categories:

What is the state of the logistics infrastructure of pharmaceuticals and healthcare products in Bangladesh?

What do you consider to be the biggest logistical issues in the management of the temperature sensitive products and shipments by your organization?

How do you think digital tools (IoT, Blockchain) can enhance supply chain visibility and compliance?

What is the role of involving the private in enhancing the cold chain capacity in Bangladesh?

What are the primary regulations that your organization has to deal with when operating with LSH products in Bangladesh?

What do you think are the future opportunities in collaboration between logistics companies and pharmaceutical firms to enhance the cold chain in Bangladesh?

What do you consider to be the most important investments or innovations in order to make Bangladesh a regional center in terms of life sciences logistics?

3.4. Data Collection

The paper has used both secondary and qualitative data sources to investigate the emerging role and prospects of Life Science and Health Sector (LSH) in Bangladesh Logistics Industry. To learn the industry tendencies, the policy framework and market size, secondary data was collected using reputable sources, including market reports, governmental publications (BIDA, DGDA), and international organizations (WHO, WTO, World Bank (WB)). Qualitative data collection was originally intended to encompass semi-structured interviews with the major stakeholders -pharmaceutical companies, logistics providers, regulators and technology firms. Nevertheless, time and availability of resources and individuals restricted the number of respondents interviewed in reality to a far smaller sample of DHL Global Forwarding Bangladesh Ltd employees and a sample of industry representatives, which guarantees the level of insights despite smaller sample size.

The qualitative data was selected due to the objective of the research to encapsulate the depth of the views, experience and strategic perception of the industry experts that cannot be entirely realized with the help of quantitative data. Since this research is exploratory and LSH

logistics is complex, including regulatory compliance, developing cold chain and adoption of technologies, qualitative information can be used to gain a richer and context-specific insight. This strategy is in line with best practices in logistics research, where qualitative interviews tend to be applied in order to reveal subtle operational and strategic challenges. (Grant et al., 2023)

Chapter 4 - Findings and Discussion.

4.1. Present situation in the LSH Logistics of Bangladesh.

The interviews showed that the logistics infrastructure of the Life Science and Health products (LSH) in Bangladesh are functional yet poorly developed. The big cities enjoy temperature-regulated transportation and storage facilities but rural locations do not have dependable cold chain facilities. The vast majority of companies are dependent on primitive warehousing and a manual-based inventory system, which reduces performance and visibility. This is in line with the secondary data which shows that the pharmaceutical sector in Bangladesh satisfies 98% of the domestic medicine demand though this is a challenge outside the urban areas.

4.2. Key Logistical Challenges

The shortcomings in cold chain were always noted by the stakeholders as the most urgent concern. Temperature variations in transportation cause vaccine and biologic spoilage with a consequent loss of money and medical care. These risks are exacerbated by infrastructure gaps including lack of good road access and lack of special handling facilities. Another common thread in the responses on the interview was regulatory complexity, in which respondents mentioned disjointed compliance requirements and absence of standards. Moreover, there is still the digital divide with smaller players keeping to manual systems, other larger firms testing GPS enabled tracking and IoT solutions.

4.3. Technology and Innovations

Respondents recognized the opportunities that digital tools such as IoT, Blockchain, and AI could have towards better visibility and compliance of the supply chain. Nevertheless, its adoption is slow because of the cost factor and awareness. GPS-enabled tracking and temperature monitoring have been introduced to the market by larger logistics companies and pharmaceutical companies, though it is not common yet. This observation makes it apparent that there is a necessity to build capacity and invest in digital infrastructure.

4.4. Teamwork and Future Prospect.

Interviewees highlighted the significance of the partnership between the governments and the businesses to increase the cold chain preparedness and standardize operations. The government plans like the API Industrial Park were perceived favorably, although the interviewees emphasized that partnership with logistics companies and technologies would be important in the expansion of infrastructure. Strategic outsourcing was also established as a trend that is on the rise and could be used to boost efficiency and cost-reduction through third-party logistics (3PL) providers.

4.5. Discussion

The results indicate that the LSH Logistics sector in Bangladesh has a high growth potential, but some order issues, including the infrastructure voids, regulatory complexity, and the lack of digitalization, have to be solved. The future of the sector depends on the ability to invest in cold chain infrastructure, use of modern technologies and cooperative structures of government, industry and technology providers. These lessons are consistent with the trends observed in the global healthcare logistics sector, where digital transformation and supply chain models are becoming the source of effectiveness and flexibility.

Chapter 5 - Recommendation

Based on the discussion of the existing challenges and prospects of the Logistics Industry of Bangladesh under the Life Science and Health (LSH) Sector, the recommendations given below are suggested:

5.1. Government and Policy Makers.

Investment in infrastructure: Focus on building multimodal logistics hubs, and better road systems and port capacity that will facilitate healthcare supply chains.

Increase Cold Chain Capacity: Visa-allocate funds towards temperature-controlled warehouses and transportation fleets, particularly in the rural and remote regions.

Harmonization of Regulations: simplify the process of compliance, implementation of digital documentation and harmonization of pharmaceutical logistics standards.

5.2. LSH Companies (Pharmaceutical and Healthcare Providers)

Strategic Investment in Cold chain: Implement new technologies on refrigeration and tracking system to ensure the integrity of products and reduce spoilage.

Digital Supply Chain Solutions: Introduce IoT-based tracking, blockchain traceability, and predictive analytics inventory optimization.

Collaborative Partnerships: form joint ventures with logistics companies and technology companies to share their infrastructure and experience.

5.3. Logistics Providers

Create LSH Capabilities: Incursion Invest in focused Life Science and Health logistics solutions, such as tested cold chain solutions and compliance expertise.

Embrace state-of-the-art technologies: Add real-time tracking, temperature control, and AI solutions to optimize routes to become more efficient.

Provide Value-Added Services: Regulatory assist, risk management and last-mile delivery services unique to healthcare products.

5.4. Public-Private Collaborations

Shared Logistics Platforms: Develop a standardized healthcare logistics environment, which facilitates sharing of resources and cost.

Capacity Building: Carry out training sessions of logistic staff about sensitive healthcare products and utilization of digital tools.

5.5. Future Research

Economic Impact Analysis: Measure the economic benefits of the enhanced LSH logistics on the GDP of Bangladesh and healthcare outcomes.

Social Implications: Discover ways in which the healthcare supply chains can be improved to create better access and equity especially among rural communities.

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