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Bridging Efficiency and Innovation: A Case Study of Supply Chain Practices at MEC Logistics

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Objective: The supply chain practices of MEC Logistics, a long-established 3PL and customs clearing business in Bangladesh, are explored through this case study. The purpose is to study how well MEC Logistics handles its operations to match what its clients desire and overcome market obstacles.

Methods: I collected the data for this study during a three-month internship at MEC Logistics by watching activities and learning through hands-on experience. The key areas under analysis here are customs clearance, ware-housing, and delivery, and the company places itself in the market via Porter's Five Forces framework.

Keywords: *supply chain management, MEC logistics, third-party logistics (3PL), warehouse management, customs clearance, Bangladesh, porter's five forces, ERP, logistics technology, operational efficiency.*

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Findings: The company performs successfully with regard to fast customs processing, standard warehouse routines, and strong support for clients such as PGCB, BPDB, DPDC, Huawei, and Ericsson. After all, improving the workforce, bringing in advanced technology, and including safety training keep facing challenges. Because of strong competition and changing customer expectations, the company must prove its resilience.

Conclusion/Implications: To ensure that the supply chain works even better and remains flexible, MEC Logistics ought to introduce ERP systems, automate warehouse operations, and provide regular safety training. By studying this case, providers in emerging markets will be able to improve their resilience, add technology to their operations, and better serve customers.

Keywords: supply chain management, MEC logistics, third-party logistics (3PL), warehouse management, customs clearance, Bangladesh, porter's five forces, ERP, logistics technology, operational efficiency.

I. Introduction

Today's global market, crowded with competitors, makes efficient supply chain management necessary for companies aiming at better stability, satisfied clients, and higher efficiency. In the words of the Council of Supply Chain Management Professionals, SCM means carefully managing the processes of supply, purchase, making, and delivering goods. Global supply chains experience many difficulties, but Bangladesh is further challenged by limited infrastructure, quick industrial growth, and the need to adapt to new regulations. Logistics service providers have to continually evolve because of these factors, driving increased overhead.

While logistics is growing in importance for Bangladesh, especially for power generation and telecommunications, little is known about how local 3PL firms handle supply chains under these conditions. With this gap in mind, this case study explores how a 3PL provider operates and responds to key challenges in the new market.

It is widely acknowledged that the progress of logistics infrastructure supports economic growth. Robust logistics and transport networks are crucial requirements for progress in trade competitiveness and sustainability in less advanced economies, according to the World Bank (2020). Other similar problems, like staff skill shortages, technology difficulties, and laws to follow, are discussed in South Asian logistics (Rahman, Karim, & Islam, 2021; Ahmed & Hossain, 2022). Because of these studies, we learn that SCM is particularly complex in developing countries and that we should study firms and how they deal with these difficulties.

An excellent example of this kind of analysis comes from MEC Logistics, which was founded in 1986 and became one of Bangladesh's leading third-party logistics and customs clearing firms. The warehouse cabins owned and managed by MEC that cover over 130,000 square feet are strategically set up for both the government and private organizations in Dhaka. That's why MEC enjoys strong partnerships with key public sector organizations such as PGCBB, PGBD, and DPDC, together with global companies, including Huawei and Ericsson. A look at MEC's supply chain job area reveals strategies that help them serve clients well in a difficult market setting.

The case study uses information from workplace observations, group interviews, and document analysis over a three-month internship. The analysis is concerned with significant supply chain activities such as getting goods through customs, managing stock, designing and managing warehouses, complying with environmental standards, and following standard procedures.

Due to its managerial role, MEC's competitive place is studied by using Porter's Five Forces framework (Porter, 1979) and the Supply Chain Operations

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Reference (SCOR) model (Supply Chain Council, 2012) to identify both strong and weak areas, mainly concerning integration of technology and the growth of the workforce.

Furthering understanding of MEC Logistics' supply chain management, this study shares insights helpful for those working in logistics and for those studying developing economies. Results suggest that MEC and similar firms can become more resilient and compete better by adopting digital features, rethinking their processes, and providing appropriate training to workers, giving useful solutions to handle current logistics challenges.

II. Methodology

In this study, participant observation, interviews, surveys and document review are used to examine the supply chain practices of MEC Logistics. For three months, the research was conducted as an internship which allowed me to become involved with several departments and their processes.

a) Research Design

An exploratory case study was selected following Yin's framework (2014) to analyze in detail MEC Logistics' supply chain operations in a developing economy. Three sectors are centered in scope: the processes of obtaining products, handling delivery, managing warehouses, and transporting goods to customers. We chose these areas because they are key in delivering MEC's services and because they let us explore challenges and improvements in the supply chain. This study aims to bring together theory and actual logistics practices in an ever-changing industry.

b) Data Collection Methods

In Participant Observation, the researcher joined and watched workers for prolonged periods in each of the departments. Because of this approach, I could practice routine work tasks and coordination among different departments. Both notes and reflective journals were kept continuously to document what was going on in the fieldwork.

Ten semi-structured interviews were completed with important personnel such as the Senior Manager of Operations & Development, Warehouse Coordinators, Logistics Officers, and Customs Clearance staff. People involved in the study were selected to cover a range of job roles and knowledge that matter in supply chain work. Change managers and team members were interviewed about how things were done operationally, what challenges they experienced, and their views on the organization's effectiveness. Before starting interviews, we got informed consent from participants, guaranteed their confidentiality, and told them they could withdraw whenever they liked. As well as the qualitative interviews, a 30-person questionnaire was sent to workers in various departments. Based on SCM literature and tested for accuracy, the questionnaire asked employees about warehouse operations, their satisfaction, and how satisfied clients were. Information about participants was removed to ensure their privacy.

The firm's internal papers, including SOPs, inventory codes, and trucking manifests, were all methodically looked at one by one. Materials were selected purposively, since they were most relevant to the three central sectors. We used SCM frameworks to look for operational standards, verification of compliance, and details on how processes differed. We also looked at the materials MEC publishes publicly, such as its website and marketing materials, to better understand its approach to clients and market positioning. Ethics were respected, allowing participants to decide to be involved, confidentially share company details, and have safe processing of the gathered data. Access to company documents was officially permitted by MEC Logistics management.2.3 Data Analysis Techniques

III. Company Overview

Founded in Bangladesh in 1986, MEC Logistics is a 3PL company that keeps specializing in C&F, warehousing and inland transportation services. During the last few years, MEC has established a reliable reputation as a preferred logistics partner for several important infrastructure and telecommunications projects for both the public and private sectors.

a) Core Business and Services

At MEC Logistics, we value a wide range of logistics solutions - customs services, forwarding, warehousing, delivering items, distribution, and handling inventory. A strong point of MEC is its certified assistance for customs clearance at major seaports in Bangladesh, handling different rules, duty fees, and timely payment arrangements. Because of this knowledge, we can avoid demurrage fees and get cargo out quickly, an important benefit in Bangladesh. There are warehouse facilities from the company in Narayangonj, Tongi, and Chattogram, and these cover more than 300,000 square feet together. Many kinds of cargo can be stored safely in these warehouses, including telecom and electrical equipment, which is facilitated by adapting the storage layout. To go along with its assets, MEC uses its in-house fleet and licensed 3PL firms under set contractual agreements to maintain accountability and quality performance. To improve operations and transparency, MEC uses WMS, which works with barcoding tools, barcode scanners, and an electronic inventory management system. Currently, the WMS is based on a vendor product, yet plans exist to replace it with an automated platform that suits changing industry expectations. It also has value-added services such as tracking shipment progress live,

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managing shipping routes, and handling relationships with drivers, which in total enhance both the reliability of delivery and communication with customers. Delivery success levels are above 95% and lead times are in line with others, yet these data are private. Because of its skills in handling large-scale supply chain functions, MEC is a top choice for leading multinationals like Huawei Technologies Bangladesh Ltd. and Ericsson Bangladesh Ltd.

b) Organizational Structure

The company MEC Logistics is privately owned and has 51 employees split among senior management, operations, warehouse management, Management Information Systems (MIS), finance, administration and customer service departments. With this system, functions team up more closely which helps in coordinating the whole supply chain process.

c) Strategic Clients and Market Position

In Bangladesh, MEC partners with government-run utility firms such as PGCB, BPDB and DPDC and also with international private-sector leaders such as Huawei Technologies and Ericsson Bangladesh. Because the company has successfully handled over half a dozen huge infrastructure projects, it is now one of the leading logistics businesses in Bangladesh. MEC's clearance process saves time, lowers charges for keeping goods unloaded and ensures they are always clear and simple for clients.

d) Competitive Advantage

MEC relies on years of knowledge, detailed knowledge of local shipping rules, easily accessible warehouses and transport and a proven group of customers worldwide to remain competitive. With logistics moving quickly towards digital solutions, MEC realizes it must improve its WMS quickly and always focus on employee training. It helps MEC allow its operations to follow best practices worldwide, putting an emphasis on automation, receiving data instantly and finding cost-saving ways to do so. Combining its heritage with new technologies and supportive partnerships- governed by clear SLAs- MEC hopes to respond quickly to current demands.

IV. Findings and Discussion

In this section, MEC Logistics' performance regarding customs clearing & forwarding, warehouse management, and transportation is presented. The conversation is made better by taking employee opinions and comparing them to the industry's best practices. Alongside describing day-to-day tasks, this section recognizes strengths and weaknesses, links the firm's situation to supply chain literature, and seeks ways to advance the supply chain using modern techniques.

a) Customs Clearing and Forwarding (C&F)

MEC Logistics has designed a uniform way of clearing customs at Bangladesh's large ports, involving Import General Manifest (IGM) documents, preparation of Bill of Entry (B/E), and regular cooperation with customs authorities for duty management. Being experienced in customs processes makes their work faster, strong connections with authorities help, and their accurate paperwork maintains costs. But because average clearance times and reductions in duty cost are missing in the system, judges have limited grounds to assess if it is working well. Besides, there are still operational problems because clients' documents arrive late, and there are uncommon mistakes caused by manual data handling, yet these issues and impacts are not regularly tracked.

b) Warehousing Operations

A network of warehouses controlled by Standard Operating Procedures (SOPs) is run by MEC to manage the flow of products in and out of the warehouse, their storage, and control of stock. RF scanners allow for cargo tracking, and system procedures are adjusted to match important clients' supply management systems, such as Huawei's CES platform. Client and product information govern the organization of warehouses, and inventory is updated each day using cargo cards and an Excel log. Team leaders and staff split the work of picking, packaging, and delivering, with detailed records and clear documentation supporting them. Still, because warehouse operations are not fully automated and include paper-based methods, these facilities are at risk. Due to this gap, people may slip up more often, take greater time to complete tasks, and be unable to scale efficiently during higher demand.

c) Transportation and Delivery

MEC relies on both its own vehicles and those it gets from external providers; all being managed under Service Level Agreements (SLAs) designed to hold everyone responsible. It helps ensure that the delivery team and clients are in sync, guided by standard delivery forms (DNs and checklists) and good monitoring and reporting. Road congestion and insufficient vehicles from nearby car rental shops cause many challenges. The lack of these tools within the organization reduces how efficiently and transparently transport operations function.

d) Employee Feedback and Survey Insights

When I surveyed thirty employees using a structured questionnaire, the findings were that they felt both teamwork and transparency in operations were high. Many discussions returned to the need for disciplined safety courses, proper equipment use training and modern systems to trim down paperwork.

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e) SCM Framework Alignment

Among its activities, MEC includes sourcing, transportation, warehousing, and managing returns as basic SCM parts. Nevertheless, organizations still lack fully developed strategic planning, quick ways to distribute information, and the use of digital SCM tools.

f) Comparison to Best-in-Class Practices

Much like other companies, MEC can deliver services, but its current tools and organization are not as advanced as global standards in automation, data handling, and how services are run. Not many companies use WMS or ERP systems, no Lean logistics or 5S warehouse practices exist, and visibility is limited without the help of prescriptive analytics.

V. Porter's Five Forces Analysis

This section applies Porter's Five Forces framework to critically analyze the competitive dynamics shaping MEC Logistics' position in Bangladesh's rapidly evolving logistics sector. While the framework offers a foundational lens, integrating data insights and forward-looking considerations provides a more robust understanding of MEC's competitive threats and strategic opportunities.

a) Threat of New Entrants - Low to Medium

Entry barriers remain significant for new players aiming to enter MEC's core areas- customs clearance, warehousing, and fleet operations- due to the substantial capital investment needed for licenses, infrastructure, and fleet acquisition, alongside the challenge of establishing client trust and compliance with customs regulations. However, recent government reforms aimed at streamlining trade facilitation, public-private infrastructure initiatives, and relaxed regulatory policies are gradually lowering these traditional barriers. Simultaneously, digital disruptors and the rise of tech-enabled 3PL startups leverage technology to bypass some conventional hurdles, entering the market with relatively low capital outlay and agile service models. For example, several new logistics startups in Bangladesh have capitalized on cloud-based platforms and automated customs clearance tools to gain rapid traction.

Strategic Insight: MEC should consider fostering strategic alliances or investing in technology incubators to collaborate with emerging digital entrants, transforming potential threats into innovation opportunities.

b) Bargaining Power of Suppliers - High

MEC's reliance on a limited pool of suppliers for vehicles, fuel, and leased warehouse spaces exposes it to high supplier power. Fluctuations in diesel prices, labor availability, and rental costs directly impact operational expenses and service reliability. However, this analysis currently lacks a quantitative assessment of how much of MEC's total operating costs are attributable to these supplier inputs, nor does it evaluate existing contractual safeguards such as long-term agreements or fuel hedging mechanisms. Additionally, MEC's absence of vertical integration- such as owning fleets or warehouses- exacerbates supplier dependency, limiting its negotiating leverage.

Strategic Insight: Implementing a supplier performance scorecard and exploring digital procurement platforms can improve vendor management and reduce over-reliance on individual suppliers. Moreover, strategic investments in owned assets or long-term contracts may mitigate cost volatility.

c) Bargaining Power of Buyers – High

Major clients like Huawei, Ericsson, PGCB, and BPDB, due to their large shipment volumes and access to alternative logistics providers, wield substantial bargaining power. The availability of competitive bids and transparent rate comparisons pressures MEC to maintain competitive pricing without compromising service quality. To differentiate in this highly buyer-driven market, MEC must prioritize customization, reliability, and value-added services to strengthen client loyalty and reduce churn.

Strategic Insight: Enhancing client relationships through dedicated account management, customized reporting dashboards, and regular business reviews can deepen engagement and foster long-term partnerships.

d) Threat of Substitutes - High

Clients' ability to internalize logistics, select alternative 3PL providers, or switch transport modes (road, rail, air) poses a significant substitution risk. Competitors like Total Asia, MMI Logistics, Step One, and MKK Logistics aggressively compete on price and technology adoption, further intensifying this threat. MEC must continuously innovate- embracing advanced technologies, improving customer responsiveness, and tailoring services- to maintain its customer base and mitigate substitution risks.

Strategic Insight: Continuous investment in technology adoption and customer-centric innovation is critical to counteract substitute offerings and retain market relevance.

e) Industry Rivalry - High

The Bangladeshi logistics sector is marked by fierce rivalry, driven by expanding import volumes, telecom sector growth (including 5G rollout), and burgeoning e-commerce demand. Limited product differentiation among 3PL providers fuels frequent price wars and aggressive bidding strategies. Industry players are increasingly deploying digital systems and cost optimization initiatives, causing rapid shifts in market share tied closely to service quality and innovation capabilities.

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Strategic Insight: MEC should pursue differentiation through superior reliability, safety standards, and expedited service delivery, supported by technology-enabled operational excellence.

Table I: Summary of Porter's Analysis

Force	Level of Threat	Strategic Implication
Threat of New Entrants	Low–Medium	Focus on operational efficiency to defend market share
Bargaining Power of Suppliers	High	Secure long-term vendor contracts and develop own assets
Bargaining Power of Buyers	High	Maintain service quality and offer value-added services
Threat of Substitutes	High	Innovate in tech adoption and customer service
Industry Rivalry	High	Differentiate through reliability, safety, and speed

f) Strategic Recommendations for MEC Logistics

Building on Porter's analysis and current supply chain assessment, MEC Logistics can strengthen its competitive position and operational resilience through the following initiatives:

1. *Adopt an Integrated ERP System:* Implementing a comprehensive ERP platform will enable real-time management of logistics, warehousing, and financial operations, enhancing visibility and interdepartmental coordination.
2. *Deploy a Modern Warehouse Management System (WMS):* Investing in scalable WMS technology with barcode scanning and real-time inventory tracking will reduce errors, accelerate processing, and optimize warehouse utilization.
3. *Enhance Workforce Training and Certification:* Structured training programs focused on safety, documentation, and equipment handling will improve operational reliability and compliance.
4. *Institutionalize Safety and Compliance:* Develop formal EHS policies, conduct routine safety audits, and enforce PPE usage to safeguard employees and meet regulatory standards.
5. *Leverage Advanced Transport Management Technologies:* Integrate GPS route optimization, load planning software, and driver tracking apps to improve delivery precision, reduce costs, and increase transparency.
6. *Implement a Performance Metrics Dashboard:* Track KPIs such as on-time delivery, inventory accuracy, customs clearance time, and labor productivity to drive continuous improvement.
7. *Strengthen Client Relationship Management:* Assign dedicated account managers, provide customized SLAs and reporting tools, and hold regular client business reviews to deepen partnerships.
8. *Explore Green Logistics Initiatives:* Adopt sustainability measures like route optimization to lower carbon footprints, energy-efficient warehousing, and partnerships with eco-friendly transport vendors.

By embracing these data-driven and forward-looking strategies, MEC Logistics can effectively navigate competitive pressures, enhance operational efficiency, and position itself as a leading, innovative logistics provider in Bangladesh's dynamic market environment.

VI. Conclusion

This case study looks closely at the supply chain methods applied by MEC Logistics, the biggest third-party logistics provider in Bangladesh. Personal observations during internships, visits to the site, and the company's documentation are all used in the study to focus on MEC's strong areas of customs clearance, storing goods, and transportation. Completing logistics tasks for clients such as Huawei, Ericsson, PGCB, and BPDB has allowed the company to stay at the forefront of infrastructure development in Bangladesh. With the use of standard tasks, strict following of processes, and strong record-keeping, MEC is now able to control demurrage, make their shipments on time, and better manage their stock. Even so, findings indicate there is plenty of scope to improve, mainly in automation, integrating new technologies, developing the workforce, and ensuring safety at work. Looking at Porter's Five Forces, we notice the market is extremely competitive because buyers and sellers have a lot of power, and there are many alternatives to the product. Because of this, MEC must focus on using advanced warehouse systems, resource planning instruments, and providing targeted training for its workers. Having a data-driven approach to interact with customers will be essential, since the industry is becoming more crowded.

At present, MEC Logistics needs to take decisive actions because the industry is being rapidly reformed by technology, new market needs, and changes in regulations. For MEC to continue leading, it needs to add new features like IoT asset monitoring, AI for planning routes, and accessible digital customer features. In addition, if workers keep learning and if data is incorporated into decision-making, the organization will become stronger and more flexible. The study's recommendations make sense for MEC and comparable businesses running in emerging markets, but it admits that estimating quantitative risk and reviewing future impacts can be limited. More research might

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explore the link between using sustainability and the use of digital systems in improving the performance of the supply chain.

In conclusion, MEC Logistics stands at a critical juncture where thoughtful investments in technology, people, and customer-centric innovation will determine its future success. This research contributes both practical guidance and a conceptual framework to help logistics providers in emerging economies navigate the delicate balance between efficient operations and strategic adaptability.

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