

Internship Report On

***Demand Forecasting and Inventory Management Enhancing
Operational Performance in the Construction Equipment
Industry: A Study on Earthmoving Solution Limited***

By

MD. MESBAHUL BARI

ID: 22264065

This internship report submitted to the Brac Business School for partial fulfillment of the pre-requisite for completing the Masters in Business Administration Degree.

BRAC Business School
Brac University
February, 2025

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Declaration

It is hereby declared that

1. The internship report submitted is my/our own original work while completing degree at BRAC University.
2. The report 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 report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I am giving my consent of providing my sources of help if there is any.

Student's Full Name & Signature:

MD. MESBAHUL BARI

ID: 22264065

Supervisor's Full Name & Signature:

Dr. Md. Hasan Maksud Chowdhury

Asst. Professor, BRAC Business School

BRAC University

Letter of Transmittal

Dr. Md. Hasan Maksud Chowdhury
Assistant Professor,
Brac Business School
BRAC University
66 Mohakhali, Dhaka-1212

Subject: Request for Consent on preparing Internship Report on Earthmoving Solution Limited

Dear Sir,

This letter is for seeking your formal permission for preparing my internship report on Earthmoving Solution Limited, where I currently serve as the Senior Manager in Sales and Marketing department, appointed in January, 2018 and to display my mid-level position provide details regarding Sales procedure, documentation, commercial works and logistics functions of this company.

As I near the completion of my Master of Business Administration degree, it is a requirement to prepare an internship report that provides an in-depth analysis of the company's operations, particularly within my domain. Earthmoving Solution Limited specializes in the sales and after-sales services of heavy construction equipment, and my report will focus on several critical areas, including sales procedures, documentation, commercial operations, and logistics functions. Given my mid-level management position, I have acquired significant insight into the processes that govern the daily and strategic operations of the company, which I believe will contribute to a comprehensive analysis in my report.

The internship report will be divided into three main sections:

1. **Overview of Responsibilities:** I will outline my role and responsibilities within the organization, focusing on the key functions I oversee in sales and marketing.
2. **Company Operations:** This section will offer a detailed description of Earthmoving Solution Limited, including its organizational structure, market positioning, and operational workflow.
3. **Comprehensive Financial and Operational Assessment:** I will conduct a thorough analysis of the company's financial standing, sales performance, and inventory efficiency. Additionally, I plan to explore potential avenues for growth, including expanding the company's sales or market reach.

This report will not only serve as a requirement for my academic program but will also allow for a holistic evaluation of the company's current position and future opportunities. I am committed to approaching this project with the utmost professionalism and dedication. Confidentiality and ethical conduct will be strictly maintained throughout the process.

I kindly request your approval to proceed with this report and would greatly appreciate your guidance and support in completing it successfully. Your insights will be invaluable in ensuring the report's success.

Thank you for considering my request.

Sincerely yours,

Md. Mesbahul Bari
ID: 22264065
MBA Program, BRAC Business School
BRAC University
Date: 16th July 2024

Non-Disclosure Agreement

[This page is for Non-Disclosure Agreement between the Earthmoving Solution Limited and The Md. Mesbahul Bari]

This Agreement is made and entered into on 1st October 2024, by and between Earthmoving Solution Limited, a company located at Greenyard Mukti Garden, 7/A/B 1st Colony, Mazar Road, Mirpur-1, Dhaka-1216 (hereinafter referred to as the "Company"), and **Md. Mesbahul Bari**, residing at Flat No. F8, Angelic, 18 Hossain Housing Society, Shyamoli, Dhaka (hereinafter referred to as the "Recipient").

WHEREAS, the Recipient has been engaged in an internship with the Company and will have access to proprietary and confidential information regarding the Company and its clients, and the Company wishes to ensure the confidentiality and protection of such sensitive information during and after the Recipient's internship;

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, both parties agree as follows:

Confidential Information: "Confidential Information" refers to any proprietary or confidential information, whether written or oral, disclosed by the Company to the Recipient during the course of the Recipient's internship. This includes, but is not limited to, business plans, financial data, client lists, marketing strategies, operational processes, and any other information deemed confidential by the Company.

Non-Disclosure: The Recipient agrees to maintain the strict confidentiality of all Confidential Information and shall not, without the prior written consent of the Company, disclose or share such information with any third party or entity. The Recipient further agrees not to use the Confidential Information for any purpose other than in connection with preparing the internship report for BRAC Business School.

Use of Confidential Information: The Recipient agrees that the Confidential Information will only be used for the sole purpose of fulfilling the requirements of the internship report. The Recipient shall not use the information for personal gain, for the benefit of others, or for any purpose unrelated to the internship or the Company's business operations.

Duty of Care: The Recipient agrees to exercise all reasonable care to prevent unauthorized use or disclosure of the Confidential Information. This includes implementing appropriate safeguards to protect the confidentiality of sensitive data and ensuring that any physical or electronic copies of such information are kept secure.

Return or Destruction of Information: Upon completion of the internship report or at the request of the Company, the Recipient agrees to promptly return or destroy all materials, documents, or copies containing any Confidential Information. This includes both physical and electronic copies, ensuring that no retained records remain in the Recipient's possession.

Term of the Agreement: This Agreement shall remain in effect for a period of six (6) months after the submission of the internship report. The obligations of confidentiality outlined in this Agreement shall survive the termination of the internship and remain binding during this term.

Governing Law: This Agreement shall be governed by and construed in accordance with the laws of the People's Republic of Bangladesh. Any disputes arising from or in connection with this Agreement shall be subject to the jurisdiction of the courts of Bangladesh.

WITNESSING WHEREOF, both the parties have agreed and executed this Agreement as the first date mentioned above.

Earthmoving Solution Limited

By:

Signature:

Name: Mozibul Haque

Managing Director of Earthmoving Solution Limited

And

Signature:

Name: Md. Mesbahul Bari

Recipient

Acknowledgement

To Whom It May Concern

I, Md. Mesbahul Bari, would like to extend my heartfelt gratitude and sincere appreciation to everyone who contributed to the successful completion of this internship report, which reflects my managerial and entrepreneurial journey with **Earthmoving Solution Limited**.

First and foremost, I would like to express my deepest thanks to my esteemed supervisor, **Dr. Md. Hasan Maksud Chowdhury**, Assistant Professor at BRAC Business School. Your unwavering support, insightful guidance, and valuable mentorship have been a constant source of inspiration throughout this journey. Your direct supervision was instrumental in helping me fulfill both the internship and this report.

I also wish to extend my gratitude to the faculty and staff of BRAC Business School for providing me with the opportunity to pursue my MBA at such a prestigious institution. The consistent guidance and academic excellence I received throughout my program have been pivotal in shaping my understanding of business functionality and management. This experience has not only fueled my passion but also fostered personal growth and a desire for continuous learning, which I will carry forward into my future endeavors.

Moreover, I would like to acknowledge the tremendous support of my colleagues at **Earthmoving Solution Limited**. I am truly fortunate to work with such a diverse, hardworking, and dedicated team, whose encouragement and collaboration have been invaluable to me as I balanced my professional responsibilities with my academic pursuits. Their unwavering assistance throughout the completion of my assignments and the preparation of this report has been deeply appreciated.

Throughout the preparation of this report, I have maintained the highest standards of business conduct, academic principles, and professional integrity. I have ensured that all the information provided is accurate, reliable, and ethically sourced. I adhered to the values of honesty, transparency, and professionalism in documenting my experiences and reflecting on the challenges, achievements, and growth encountered during my journey. While words cannot fully capture the struggles and mental challenges faced along the way, I have endeavored to present a structured framework of my experience within the scope of this report.

In conclusion, I would like to express my deepest appreciation to everyone who has supported me in both my professional journey with **Earthmoving Solution Limited** and my academic journey with BRAC University. Your steadfast belief in my potential, encouragement, and guidance have been invaluable, and I look forward to continuing this journey toward excellence with renewed commitment.

Thanking you.

Sincerely,

Md. Mesbahul Bari

ID: 22264065

Major in Operation Management

MBA Program

Abstract

This internship report presents a detailed exploration of Earthmoving Solution Limited (EMSL), a premier supplier of construction equipment in Bangladesh. Established to meet the increasing demands of the construction sector, EMSL offers an extensive portfolio of heavy machinery and innovative solutions designed to support a wide range of construction projects. The company's product offerings include rigs, cranes, excavators, compactors, dozers, dump trucks, concrete mixer trucks, and concrete batching plants, catering to diverse construction needs.

In addition to conventional construction machinery, EMSL specializes in asphalt road construction, providing essential equipment such as asphalt making plants, bitumen distributors, asphalt paving machines, and rollers. Furthermore, EMSL addresses soil stabilization challenges through the use of pre-fabricated vertical drains (PVD) and supports the production of alternative building materials, including Uni pavers, river protection blocks, and other concrete products utilizing advanced concrete block-making machines.

As the exclusive dealer of XCMG and SINOTRUK, a leading Chinese manufacturer of heavy construction equipment, EMSL ensures the delivery of high-quality machinery to its clients. This commitment to excellence is further underscored by partnerships with renowned brands such as AMMANN, a Swiss company specializing in asphalt machinery, and ZENITH, a German manufacturer of block-making equipment. These strategic alliances enhance EMSL's capacity to provide cutting-edge solutions that meet the evolving needs of the construction industry.

The report also delves into the operational structure of EMSL's sales and service teams, which are dedicated to delivering specialized support for each type of machinery. This tailored approach enables EMSL to effectively address the diverse requirements of clients across Bangladesh, ensuring unparalleled Sales and service solutions that drive project success.

Throughout my internship, I gained valuable insights into EMSL's strategic operations and commitment to quality. This report encapsulates my experiences and reflections, emphasizing the company's pivotal role in advancing the construction sector in Bangladesh through innovative machinery and dedicated support.

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List of Acronyms

EMSL	Earthmoving Solution Ltd
AIT	Advance Income Tax
TDS	Tax Deducted from Source
L/C	Letters of Credits
T/T	Telegraphic Transfer
FOB	Free on Board
CIF	Cost. Insurance and Freight

Chapter 1

[Overview of the Job]

1.1 [Student Information]

Name: Md. Mesbahul Bari

ID: 22264065

Program: MBA

Major: Operation Management

1.2 [Job Information]

1.2.1. Period: January, 2018- Continue

Company Name: Earthmoving Solution Ltd.

Department: Sales & Marketing

Address: 7A/B, 1st Colony, Mazar Road, Mirpur-1, Dhaka-1216

1.2.2. Supervisor Information:

Name: Engr. Md. Mozibul Haque

Designation: Managing Director

Job Responsibility:

a) Leadership of sales team:

- i) supervise and lead the sales team responsible for construction equipment sales and marketing and branding & Promotion. Allocate specific tasks and responsibilities to each team member based on their skill and expertise.
- ii) Provide guidance, support and direction to the team member to ensure efficient and effective sales. Identify training needs and organize training sessions to keep the teams with the latest technologies and best practices.
- iii) Ensure the team uses the correct sales techniques and follow business protocol.

b) Reporting:

- i) Generate monthly and early report on equipment sales, receivable, ensuring accuracy and timeliness.
- ii) Analyze sales data to identify trends and opportunity for improvement.
- iii) Prepare details sales report, documenting the nature of customers, equipment inquiry, projects, time taken and any other relevant information.

c) Client Communication:

- i) Act as a primary point of contact between clients and manufacturer, facilitating clear and effective communication.
- ii) Address clients' inquiries, concern and request in timely and professional manner.

iii) Collect and analyze client feedback to improve sales quantity and customer satisfaction.

d) Database Maintenance:

i) Maintain a comprehensive database of machine population and sales history, including sales records and clients' information.

ii) Ensure data accuracy and completeness for informed decision and effective service delivery.

e) Schedule Management:

i) Develop and manage meeting schedules, coordinating with clients and internal teams to ensure timely execution of the order.

ii) Optimize scheduling to maximize resource utilization and minimize downtime for clients.

f) Inventory Management:

i) Oversee the maintenance of equipment inventory, including procurement, Stock tracking, and replenishment.

ii) Implement inventory control measure to prevent stockouts and excess inventory, optimizing cost -efficiency.

1.3 [Internship Outcome]

1.3.1. Contribution to the company:

Since my joining EMSL in January 2018, I identified a significant need for systematic procedures and system for managing equipment sales data, Letter of credit (LC) records, Local sales record and inventory. EMSL was not utilizing any software for these tasks. Therefore, my first objectives were to develop a system that would enable effective tracking and management for myself and management team.

I created a comprehensive database using Excel with macros to manage machine population data. This database tracks the requirements or demand of machines, quotation record and percentage of successful order, their execution and commissioning dates, warranty status, customer details, factory contacts, and machine serial numbers.

As the person responsible for sales, I focused on ensuring product availability and minimizing lead time while keeping inventory costs low. Previously, equipment was imported only after customer orders were confirmed, which resulted in extended lead times and customer dissatisfaction. I identified the most in-demand and critical products, analyzed past sales data, and initiated regular stocking of these key items in our warehouse based on demand forecasts. I established pricing strategies that considered product cost, shipping, customs duties, and warehousing overheads to ensure competitive yet profitable pricing. Additionally, I developed an inventory tracking system using Excel to monitor sales, stock levels, and reorder requirements, improving our responsiveness to customer needs and enhancing overall sales performance.

1.3.2. Benefits to the student:

Joining EMSL has been a transforming experience, allowing me to applying my engineering knowledge in practical, real-world scenarios. This opportunity has not only enhanced my technical skill but also broadened my understanding of various engineering disciplines and improve my managerial and commercial acumen.

a) Technical Knowledge and Skill

Working at EMSL has provided me with extensive hands-on experience in selling diverse machinery, including cranes, rigs, excavators, payloaders, concrete machinery, road machinery, dump trucks, mixer trucks and other heavy-duty trucks and equipment. Through my role in sales, I have gained a deep understanding of their key features, applications, and market demands, allowing me to effectively communicate the value proposition to clients. My involvement with selling heavy construction machinery, in particular, has enabled me to develop expertise in addressing customer needs, explaining technical specifications, and aligning product offerings with project requirements. This experience has enhanced my ability to build strong client relationships and drive successful sales strategies across various heavy equipment categories.

- **Mechanical and Electric Engineering Integration:** Although my academic background is in mechanical engineering, I have gained substantial knowledge in the technical aspects of electrical engineering, which has proven valuable in my sales role. This includes a strong understanding of machine wiring and electrical systems, allowing me to better address customer inquiries, explain product features, and offer tailored solutions based on the electrical and operational needs of the equipment. This

technical knowledge has enhanced my ability to communicate effectively with clients, especially when discussing complex machinery, ultimately contributing to successful sales outcomes.

- **Civil Engineering Insight:** In my role within the heavy construction machinery sector, I have also developed an understanding of civil engineering principles, particularly in relation to machine foundation requirements. This expertise has enabled me to interpret foundation drawings and provide informed consultancy to clients, ensuring they select the appropriate equipment for their projects. By effectively communicating the technical requirements and aligning them with the project's needs, I help clients make well-informed decisions, enhancing both project efficiency and equipment performance.

b) People Management and Customer Relationship

EMSL has provide invaluable experience in people management. I have learned how to

- **Lead and Motivate Teams:** Managing team and effective and efficient task completion has been a significant part of my role. I have developed skill in team motivation and leadership.
- **Customer Relationship Management:** Handling customer relationship taught me how to manage customer needs, address their concerns, and mitigate dissatisfaction. This has been crucial in maintaining customer loyalty and trust.

c) Commercial and Logistical Knowledge

Working at EMSL has expanded my understanding of commercial and logistical operation.

Key learning includes

- **Incoterms and Financial instruments:** I have gained a comprehensive understanding of commercial incoterms such as L/C (Letter of Credit), T/T (Telegraphic Transfer), Deferred L/C, FOB (Free on Board), and CIF (Cost, Insurance and Freight). I have learned to open L/C and T/T's and scrutinize draft copy of these financial instruments.
- **Customs regulation and Import Duties:** I have familiarized myself with custom regulation in Bangladesh and the duties and tax applicable to the machinery EMSL imports and sells. This includes dealing with CNF (Custom and Freight) agent to ensure compliance with all legal requirements.

d) Sales and Marketing in Heavy Machinery Industry

EMSL has offered me profound insights into the sales and marketing dynamics of heavy machinery industry. Key aspects include

- **Lead Generation and Conversion:** I have learned how leads are generated and converted into deals within the heavy machinery sector. This involves understanding customer needs and effectively communicating the benefits of our machinery.
- **Equipment Sales:** I have developed strategies for selling equipment, including sourcing them both locally and internationally. I have learned customer tendencies to seek alternative sources for equipment and to persuade them to choose the best alternatives.

e) Managing Multiple Responsibilities and Working Under Pressure

The demanding environment at EMSL has taught me how to manage multiple responsibilities efficiently and effectively. I have learned to work under pressure, prioritize tasks and ensure that all duties are performed to the highest standards.

In conclusion, my tenure at EMSL has been an enriching experience that has significantly broadened my technical knowledge, enhanced my managerial capabilities, and provided me a deep understanding of commercial and logistical operation. This comprehensive exposure has equipped me with the skills necessary to excel in the engineering field and business studies, offering students a real world's perspective on the diverse application of their academic learning.

1.3.3. Problem/Difficulties

Here are some difficulties that I am facing at Earthmoving Solution Limited (EMSL) based on my role and responsibilities:

- a) **Inventory Management Challenges:** Balancing inventory costs while ensuring product availability is an ongoing challenge. Overestimating demand can lead to excess stock, tying up capital and increasing storage costs, whereas underestimating it can result in stockouts, long lead times, and customer dissatisfaction.

- b) **Supplier Delays:** The reliance on international suppliers, such as XCMG, SINOTRUK, AMMANN, CeTeau and QGM-ZENITH, for machinery lead to delays due to shipping, customs clearance, or production slowdowns. These delays disrupt the supply chain, affecting both sales timelines and customer satisfaction.
- c) **Fluctuating Market Demand:** Demand for heavy machinery can be unpredictable, influenced by macroeconomic factors, construction trends, and government policies. This makes it difficult to forecast accurately and maintain optimal inventory levels, impacting sales performance.
- d) **Intense Competition:** The construction equipment market is highly competitive, with multiple local and international players. Differentiating EMSL from competitors while maintaining competitive pricing and delivering superior customer service is a continuous challenge.
- e) **Technological Advancements:** With the rapid advancement of technology in construction machinery, it can be challenging to stay updated with the latest innovations and incorporate these into sales pitches, especially when customers demand cutting-edge solutions.
- f) **Customer Expectations and Customization:** Clients often expect highly customized solutions, which can lead to extended sales cycles and difficulties in aligning product specifications with customer needs. Managing these expectations while maintaining profitability requires careful negotiation and technical knowledge.
- g) **Coordination Between Sales and Service Teams:** Ensuring seamless coordination between the sales and service teams is crucial for maintaining customer satisfaction, especially when it comes to after-sales support and technical assistance. Miscommunication or delays in service can damage customer relationships.
- h) **Regulatory and Compliance Issues:** Navigating the regulatory environment, including customs duties, import regulations, and compliance with local construction

standards, adds complexity to both sales and logistics functions, potentially causing delays and increased operational costs.

These challenges I see as opportunities for process improvement, innovation, and strengthening the company's competitive position in the market.

1.3.4. Recommendations

To address the challenges, I am facing at Earthmoving Solution Limited (EMSL), here are several recommendations that could help minimize or resolve these issues:

a) Improve Inventory Management through Advanced Forecasting

Implement more sophisticated demand forecasting tools and techniques, such as predictive analytics, to analyze historical sales data and market trends. This can help better anticipate customer needs and optimize inventory levels, minimizing both stockouts and overstocking.

- Benefit: Reduces holding costs and ensures timely product availability, improving customer satisfaction and operational efficiency.

b) Strengthen Supplier Relationships and Diversify Supply Chain

Develop stronger relationships with current suppliers by negotiating better lead time agreements and exploring alternative supply chains to reduce reliance on a single supplier. Regular communication with suppliers and proactive order planning can help mitigate delays.

- Benefit: A more reliable supply chain leads to reduced lead times, improving customer satisfaction and preventing project delays.

c) Adopt Flexible Sales Strategies to Respond to Market Fluctuations

Implement a flexible sales strategy that can adjust to market fluctuations by closely monitoring industry trends, construction sector forecasts, and macroeconomic indicators. Additionally, build a buffer stock of fast-moving machinery and parts during high-demand periods.

- Benefit: Ensures that EMSL can swiftly respond to changes in demand, minimizing lost sales opportunities and maintaining customer satisfaction.

d) Enhance Differentiation through Value-Added Services

Focus on offering value-added services, such as customized financing options, extended warranties, and enhanced after-sales support. Also, emphasize EMSL's exclusive partnerships with brands like XCMG, SINOTRUK, AMMANN, CeTeau and QGM-ZENITH to highlight product quality and reliability.

- Benefit: Differentiates EMSL from competitors, builds customer loyalty, and justifies premium pricing by offering additional value.

e) Invest in Continuous Training for Sales Teams on New Technologies

Provide ongoing training for the sales team to stay updated on the latest technological advancements in construction machinery. This will ensure that the team can confidently discuss cutting-edge features and benefits with customers, positioning EMSL as a forward-thinking provider.

- Benefit: Keeps the sales team competitive and enhances the customer experience by offering expert, up-to-date product knowledge.

f) Improve Communication and Coordination Between Sales and Service Teams

Implement a unified customer relationship management (CRM) system that allows the sales and service teams to share real-time information regarding customer orders, product performance, and service needs. Establish regular cross-department meetings to improve collaboration.

- Benefit: Enhances customer satisfaction by ensuring smooth post-sales support and quick response times to technical issues, leading to stronger customer relationships.

g) Streamline Compliance and Regulatory Processes

Set up a dedicated compliance team or software solution to streamline the handling of regulatory issues, customs duties, and import/export documentation. This will help ensure timely adherence to legal requirements and minimize delays caused by bureaucratic hurdles.

- Benefit: Reduces delays related to regulatory processes and avoids potential fines or penalties, keeping operations smooth and cost-efficient.

h) Offer Customization Solutions with Defined Limits

While providing customization, clearly communicate the boundaries of product customization in terms of cost, delivery time, and technical feasibility. Develop standard packages for common custom requests to streamline the process.

- Benefit: Manages customer expectations better, reducing extended sales cycles, and ensures that customization doesn't erode profitability.

By addressing these issues with strategic improvements, EMSL can strengthen its operational efficiency, customer satisfaction, and competitive edge in the heavy machinery market.

Chapter 2

[Organization Part]

2. Introduction

2.1. Overview of the Company

2.1.1. Empowering Bangladesh's Construction Industry: EMSL's Journey

Established in 2016, EMSL embarked on a mission to revolutionize the construction landscape of Bangladesh. With a commitment to provide top- notch machinery, they set out to elevate the efficiency and quality of construction projects across the nation.

a) Pioneering Partnership

From its inception, EMSL forged its pivotal partnerships with industry giants to bring cutting-edge technology to Bangladesh. As the exclusive distributor of XCMG (Xuzhou Construction Machinery Group) in the country, EMSL ensured access to world class machinery the third largest construction equipment manufacturer globally. Their range of offerings, including drilling rigs, cranes, excavator, compactors wheel loader and dozers, empower construction companies to undertake projects with unprecedented efficiency and reliability.

b) Expanding Horizon

Building on their success with XCMG, EMSL expanded its portfolio by becoming the sole distributor of SINOTRUK, China's foremost state-owned vehicle manufacturer, in the Bangladesh Market. This strategic partnership enabled EMSL to supply a diverse array of vehicles, including dump trucks, concrete mixer trucks, fire trucks, water tanker, prime movers and small trucks, catering to the multifaceted needs of construction industry.

c) Innovative solution

In 2017, EMSL further cemented its position as a trailblazer in the industry by securing the dealership of QGM-ZENITH, a German brand under Chinese ownership renowned for its concrete block making machines. This collaboration facilitated the introduction of advanced block making technology to Bangladesh, empowering customers such as Concord Group, Mir Concrete Products Ltd., Rupshi Concrete Products Ltd., Meghna

Group, Western Engineering Pvt. Ltd., and others to enhance their production capabilities.

2.2. Management Practices

2.2.1. EMSL's Management Structure: A Hierarchical Approach

EMSL adheres to a hierarchical management system, where decision making authority emanates from the upper echelons of the organization. At the helm is the Managing Director, who serves as the pivotal figures responsible for setting the strategic direction of the company.

a) Hierarchical Framework

Under the managing director, a tiered structure of senior and higher management ensures efficient operation and strategic alignment. This includes key position such as the Managing Director, Chief Executive Officer (CEO), General Manager (Sales & Marketing), Executive Director (Sales & Marketing), Deputy General Manager (Product Support), and Assistant General Manager (Accounts & Finance).

b) Division & Departments

Within this framework, various division and departments are delineated, each with its own set of responsibilities and reporting lines. The CEO oversees middle management and front-line executives in the HR, Admin and Logistic departments. The GM of Sales & Marketing manages managers, service engineers and sales executive in the product support department of equipment brand like AMMANN and QGM-ZENITH. Similarly, the DGM of product support oversees managers and service engineers for XCMG and SINOTRUK equipment.

c) Decision Making Dynamics

Strategic decisions are predominantly the purview of Managing Director and senior management, ensuring coherence with the company's overreaching objectives. However, within individual sales and service department of individual equipment brands, or department, managers retain autonomy to make functional decision tailored to their specific operational needs. These managers are supported by dedicated account

personnel who report to both their respective department head (e.g., Head of XCMG and SINOTRUK sales departments and AGM of account department).

EMSL's hierarchical management approach ensures clear line of authority and accountability, facilitating efficient decision making and cohesive operation across the organization. By delineating responsibilities and empowering managers within functional departments, EMSL optimizes its ability to deliver exceptional sales and support to its clientele in the construction industry.

2.3. Marketing Practices of EMSL

a) Client Base

EMSL primarily operates in B2B (Business to Business) sector, offering product and services designed for business entities rather than individual consumers. Their clientele includes prominent construction companies such as ABDUL MONEM LTD., MIR GROUP, SPECTRA ENGINEERS LTD., TANVIR CONSTRUCTION LTD., TOMA GROUP, NDE etc. Additionally, EMSL serves all government-listed contractor and industrial client in manufacturing sector, including major group like BASHUNDHARA GROUP, MEGHNA GROUP, and CITY GROUP etc.

b) Sales Activities

As a B2B business, EMSL's sales activities heavily rely on their sales force and person to person communication. The sales team visit the supply chain, procurement and engineering departments of potential customers to meet with responsible personnel. They collect queries, present the EMSL's product portfolio, identify leads and convert those leads into deal.

c) Conferences and Programs

In addition to direct sales effort, EMSL hosts several conferences and program. These events construction industries players and government officials to learn about EMSL's product and services, thereby educating and raising awareness among potential customers.

d) Customer Loyalty Program

EMSL arrange customer loyalty programs, offering gifts such as T-shirts, umbrella branded with EMSL logo and name. These initiatives serve as brand activities, enhancing customer engagement and loyalty. Furthermore, EMSL distribute New Year souvenirs like calendars, paperweights, pens and card holders as apart of brand introduction efforts, reminding customer of their market presence.

e) Advertising and Digital presence

EMSL invest in advertising through print media, such as daily newspaper, and television. They maintain an active presence in digital realm with a Facebook page and You Tube channel. On these platforms, EMSL post productions, activity updates and video showcasing their machinery and work process.

f) Corporate Social Responsibility (CSR) Activities

EMSL is committed to corporate social responsibility activities. They offer scholarship to talented students from various educational institutions and distribute warm clothing to the poor during the winter season.

g) Marketing Strategy

Based on the above practices, EMSL follow and integrated marketing strategy that combine direct sales effort, customer relationship management, event marketing, advertising, digital marketing and CSR initiatives. This multifaced approach helps EMSL maintain strong customer relationships, enhanced brand recognition, and demonstrate their commitment to social responsibility.

2.4. Financial performances & Accounting practices

Here I am discussing the financial performances of the Sales & Marketing Department where I am working currently.

2.4.1. SALES FY 2019-2023

Table 1: Total sales of Fiscal Year 2019 to 2023

YEAR	TOTAL SALES
2019	290,999,599
2020	717,033,117
2021	993,514,778
2022	851,050,000
2023	628,105,000

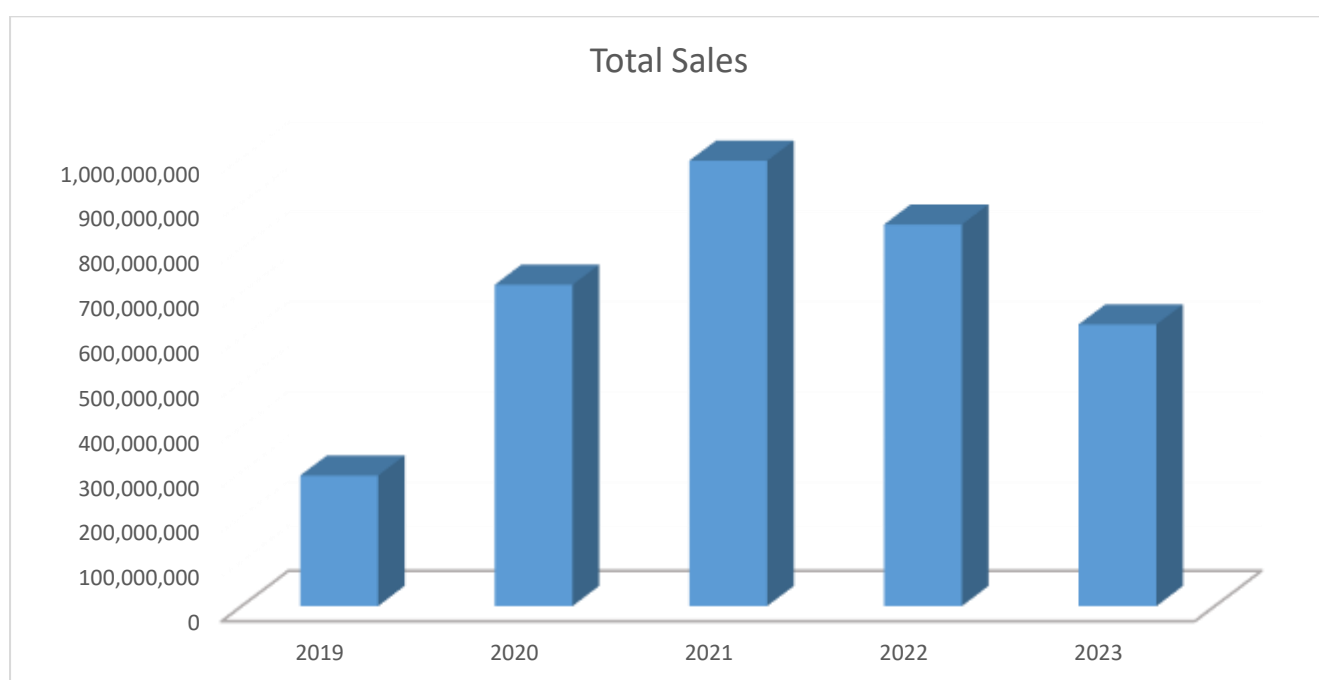


Figure 1: Bar chart of Total Sales of Fiscal year 2019 to 2023

Sales decrease 27% in year 2023 compare to year 2022. In 2021 sales was much higher compared to the other FY as many new projects started at that time and demand was high. In 2019 sales was much less compare to other FY year due to COVID-19 pandemic and Ukraine-Russia war.

2.4.2. COST OF GOODS SOLD FY 2019-2023

Table 2: Cost of goods sold of Fiscal year from 2019 to 2023

YEAR	TOTAL COST OF GOODS SOLD
2019	247,347,735
2020	609,478,149
2021	844,891,717
2022	723,392,500
2023	547,230,000

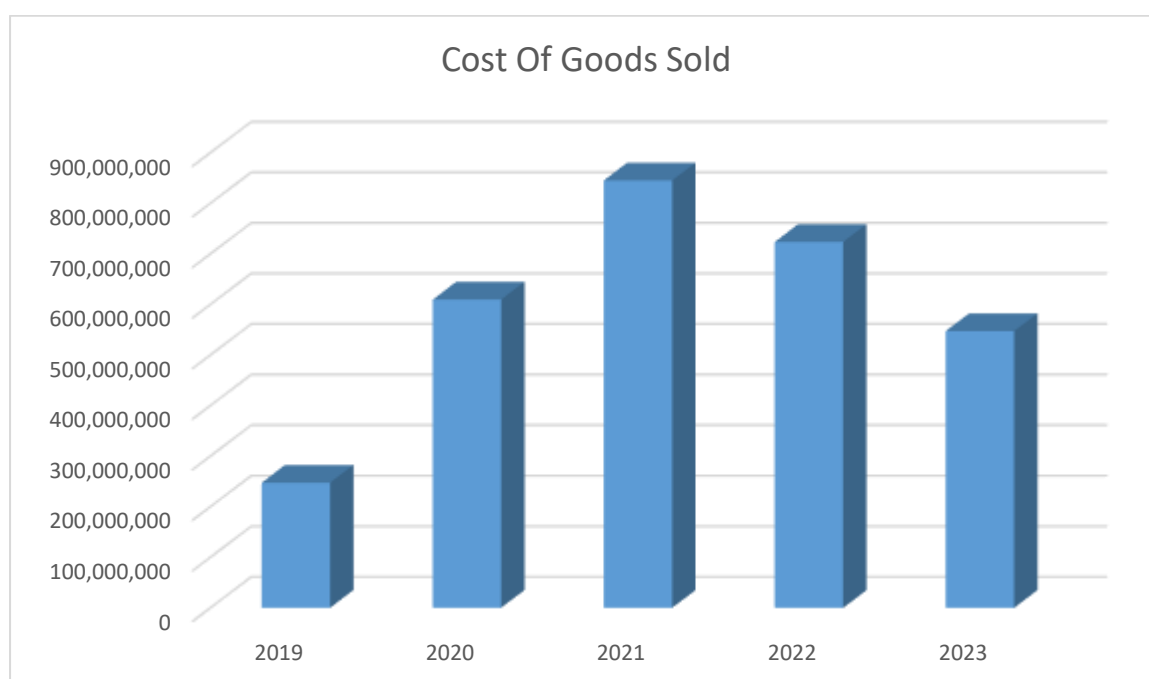


Figure 2: Cost of goods sold of Fiscal Year 2019 to 2023

Cost of Goods Sold is similar with the total sales in the respective financial year.

2.4.3. INVENTORIES FY 2019-2023

Table 3: Inventories of Fiscal year 2019 to 2023

YEAR	TOTAL INVENTORIES
2019	19,304,479
2020	16,470,500
2021	133,423,000
2022	140,325,848
2023	40,564,000

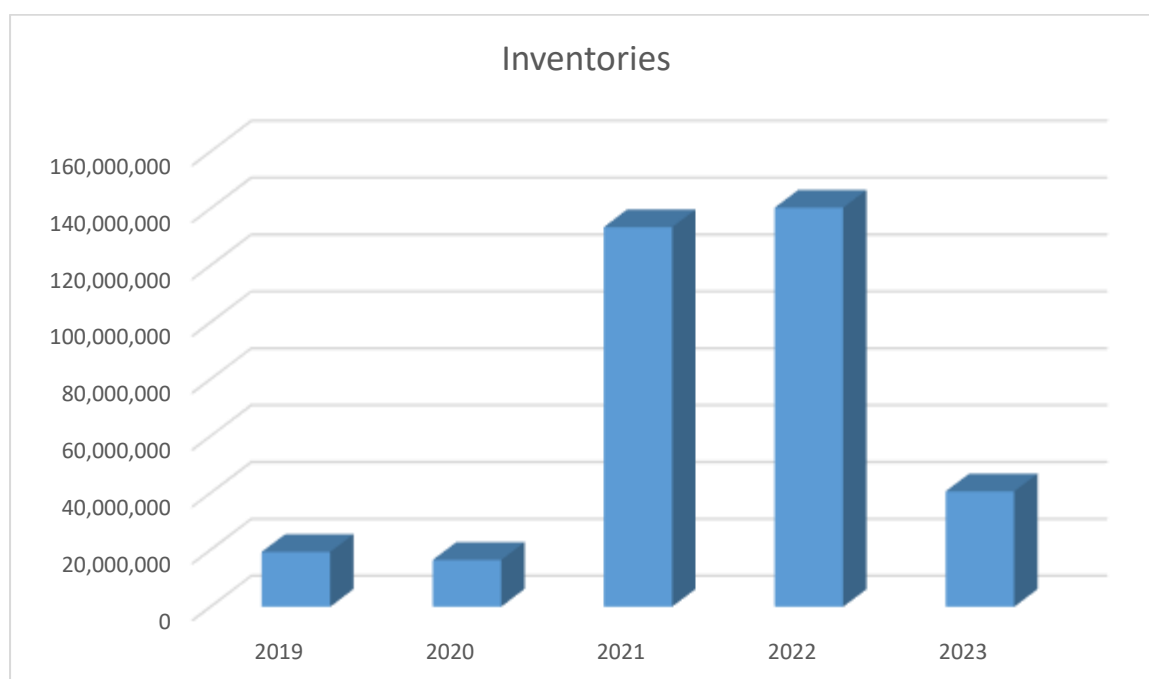


Figure 3: Inventories of Fiscal Year 2019 to 2023

In year 2021 and 2022 the inventories were much higher compared to the other FY as EMSL ordered more based on the demand forecasting. But in 2022 sales was little less compared to 2021, so the inventories was little as well that incurred more inventory management cost. So, in next FY 2023, EMSL didn't order more and sale from the ready stock to reduce their inventory management cost.

2.4.4. EXPENSES FY 2019-2023

Table 4: Expanse of Fiscal year 2019 to 2023

YEAR	GENERAL EXPENSE
2019	11,648,649
2020	12,344,772
2021	12,544,860
2022	11,658,291
2023	10,751,050

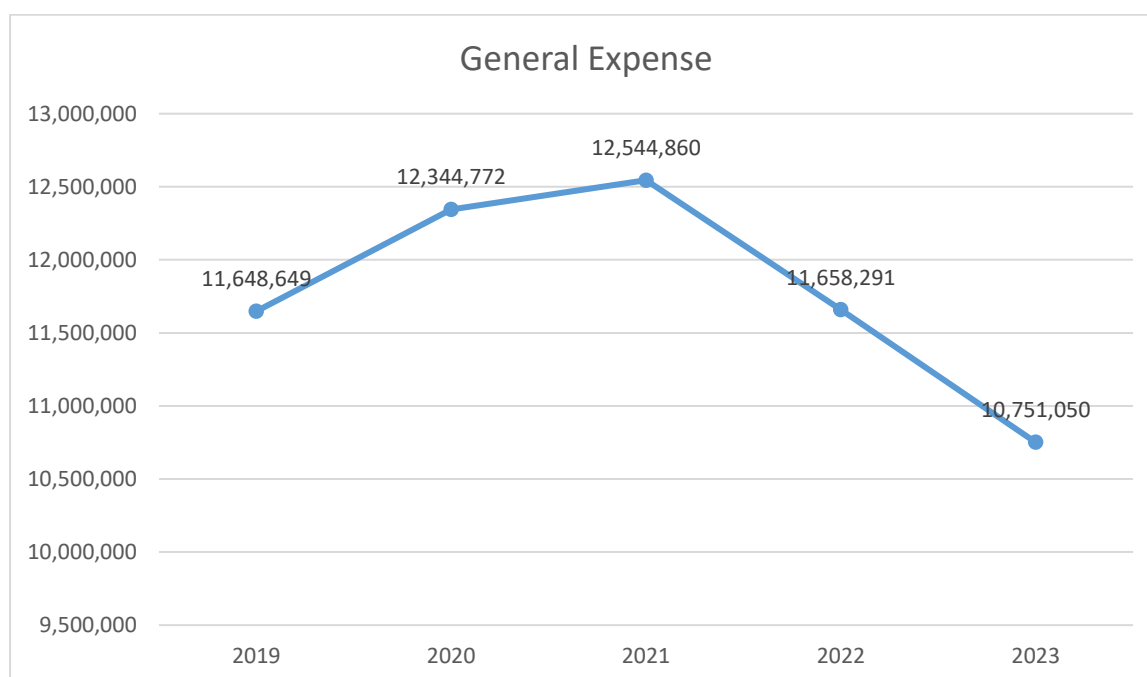


Figure 4 : General expanse of Fiscal Year 2019 to 2023

In 2019 the general expense was less because of the COVID-19, everybody did home office and salary also cut 30%-50% for different level of employees. But for 2020 and 2021 FY it increased and the demand increases. But from 2022 the management decided to cut the expense and it became 15% less compared to the 2021 FY.

YEAR	MARKETING EXPENSE
2019	21,887,000
2020	17,432,500
2021	17,986,400
2022	16,856,400
2023	9,994,500

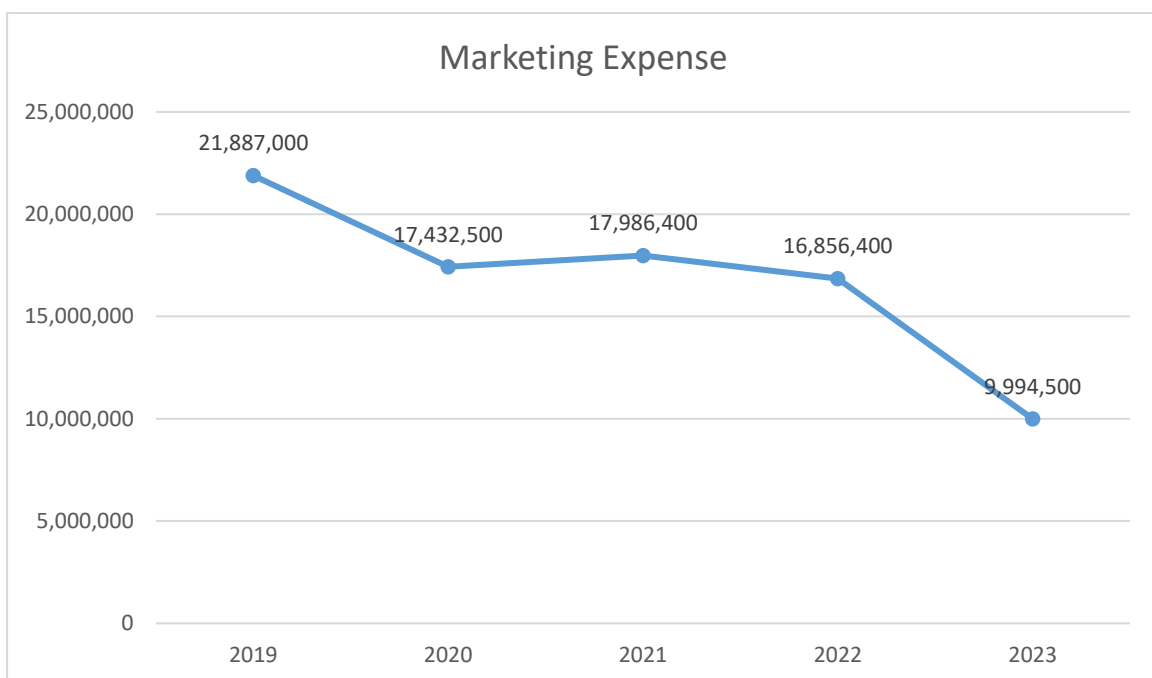


Figure 5: Marketing Expanse of Fiscal Year 2019 to 2023

In 2019 the marketing expense was much higher compared to the other FY as EMSL host different events at the beginning to promote the business and then suddenly COVID-19 come. From the next consecutive FY, EMSL keeps the cost under margin and become lowest in 2023 considering the national election and others.

2.5. Industry and competitive analysis

2.5.1. SWOT analysis of EMSL

Strength

- **Experienced sales team:** EMSL's sales team is composed of seasoned engineers who have been with the company since its inception. Their technical expertise allows for precise and clear explanation of machinery specification to customer.
- **Strong Customer Relationship Management:** EMSL excel in building trust and reliability with customer by assisting them beyond the scope of their business, thereby strengthening customer loyalty.
- **Highly Skilled Service Team:** The service team is prompt, skill and dedicated, providing on time response, remote assistance and after hour support to ensure customer satisfaction.
- **Supportive Work Environment:** EMSL foster open and friendly work environment where new members receive support and encouragement from seasoned employees, promoting quick adaptation and skill enhancement.

Weakness

- **High Initial Investment:** The construction equipment business requires significant capital investment, which can strain cash flow.
- **Dependency on Imported Machinery:** Reliance on international suppliers can expose the company to currency fluctuations and supply chain disruptions.
- **Limited Market Diversification:** Heavy focus on construction equipment without significant presence in other machinery sectors.
- **Service Network Scalability:** While EMSL provides quality service, scaling the network to rural areas could pose challenges.

Opportunities

- **Growing Construction Industry:** Bangladesh's booming infrastructure projects, including roads, bridges, and housing, create high demand for construction equipment.

- **Government Initiatives:** Increased government spending on infrastructure development opens up opportunities for long-term contracts.
- **Technological Advancements:** Adoption of advanced machinery and digital solutions can enhance operational efficiency and attract tech-savvy clients.
- **Sustainability Trends:** Introducing eco-friendly machinery to align with global environmental standards could appeal to clients prioritizing sustainability.
- **Market Expansion:** Expanding into untapped regions or neighboring markets like Nepal and Myanmar.

Threats

- **Economic and Political Instability:** Unstable dollar rates, dollar shortage and political instability could affect pricing, L/C opening, and overall market growth.
- **Increasing Competition:** As demand grows, more competitors are entering the market, making it more challenging to maintain market share.
- **Technological Change:** Rapid technology advancement can render existing machine obsolete, requiring continuous updates and adaptations.
- **Market Saturation:** While the market is currently growing, it is expected to reach saturation in next 6-8 years, particularly in the block making machine segment.
- **Rising Operational Costs:** Increasing fuel, labor, and maintenance costs could impact profitability

2.5.2. Industry Analysis

Market Overview

The construction equipment market in Bangladesh is rapidly expanding, driven by extensive infrastructure development projects, including highways, bridges, housing, and commercial developments. Government initiatives like the "Delta Plan 2100" and investments in power and energy infrastructure have significantly increased demand for high-quality construction machinery.

a) Key Trends

- **Urbanization and Industrial Growth:** Rapid urbanization and industrialization have fueled the need for reliable and efficient construction equipment.
- **Technological Advancements:** The growing interest in automated and fuel-efficient machinery is reshaping market preferences.
- **Sustainability Focus:** A shift toward environmentally friendly construction equipment aligns with global sustainability goals and client demands.

b) Competitive Landscape

- **Major Players:** The market is dominated by both local suppliers and international brands, with EMSL competing against companies like Caterpillar, Komatsu, and JCB.
- **Competitive Edge:** EMSL stands out due to its extensive fleet, strong after-sales service, and commitment to timely delivery.

c) Customer Segments:

EMSL primarily serves:

- **Construction Companies:** Both large-scale and medium-sized firms engaged in infrastructure projects.
- **Government Contractors:** Companies involved in public sector projects.
- **Industrial Enterprises:** Businesses requiring specialized machinery for production and expansion.

d) Challenges in the Market

- **Economic Fluctuations:** Currency instability and inflation can affect purchasing power.
- **Import Dependency:** The market's reliance on imported machinery exposes it to global supply chain disruptions.
- **Price Sensitivity:** Customers often prioritize cost over quality, increasing competition.

e) Opportunities

- Expanding EMSL's footprint into emerging markets within rural areas.
- Leveraging technological advancements to introduce innovative products.
- Partnering with global brands to provide a broader range of solutions.

2.6. Summary & Conclusion

EMSL has positioned itself as a significant player in the construction industry of Bangladesh since its establishment in 2016. Through strategic partnerships with global giants like XCMG, SINOTRUK, and QGM-ZENITH, EMSL has introduced advanced machinery and vehicles that enhance the efficiency and reliability of construction projects across the country. The company's hierarchical management structure ensures clear lines of authority and accountability, facilitating effective decision-making and streamlined operations.

EMSL's marketing practices encompass a multifaceted approach, integrating direct sales efforts, customer relationship management, event marketing, advertising, digital marketing, and corporate social responsibility initiatives. This strategy not only strengthens customer relationships and brand recognition but also demonstrates the company's commitment to social responsibility.

The SWOT analysis reveals EMSL's strengths in its experienced sales team, strong customer relationship management, highly skilled service team, and supportive work environment. However, the company faces weaknesses such as High Initial Investment, Dependency on Imported Machinery, Limited Market Diversification, Service Network Scalability.

Opportunities abound in the growing construction industry, government initiatives promoting concrete blocks, and long-term market growth. Nevertheless, EMSL must navigate threats like economic and political instability, increasing competition, rapid technological changes, and potential market saturation.

The industry analysis highlights robust growth driven by Bangladesh's development and government infrastructure projects. However, challenges such as economic instability, fluctuating dollar rates, and political uncertainties pose risks. The competitive landscape is increasingly crowded, necessitating continuous innovation and adaptation.

In conclusion, EMSL's strategic partnerships, comprehensive marketing practices, and strong internal capabilities position it well for continued success. Addressing weaknesses and capitalizing on opportunities

Chapter 3 (Project)

[Forecasting Analysis of EMSL Sales]

3.1. Introduction

3.1.1. Background of the Project

EMSL currently does not utilize any forecasting method to predict the demand for equipment. In this analysis, we aim to determine the most suitable forecasting method for EMSL by examining equipment sales data, specifically for XCMG, which constitute the majority of the equipment sales. I used sales data from the past 24 months, divided into quarters, to evaluate three different forecasting methods:

1. Moving Average Method (3-period)
2. Weighted Moving Average Method (3-period)
3. Exponential Smoothing Method

3.1.2. Objectives of the Study

The primary objectives of this research are:

- To analyze EMSL's current sales patterns and demand fluctuations.
- To determine the most suitable forecasting method for predicting equipment demand.
- To improve EMSL's inventory management by reducing overstocking and stockouts.
- To minimize lead times and optimize order placements based on accurate demand forecasts.
- To assess the forecasting accuracy using error measurement techniques such as MAD, MAPE, and MASE.

3.1.3. Significance of the objectives

Effective demand forecasting is crucial for EMSL's operational efficiency and business sustainability. This study provides significant insights into:

- Enhancing decision-making processes in procurement and inventory management.
- Reducing unnecessary inventory costs and improving cash flow.
- Strengthening EMSL's competitive position in the construction equipment industry.

- Contributing to overall business growth by ensuring timely availability of equipment to customers.

3.1.4. Limitations of the study

- The study is based on historical data, which may not fully capture sudden market changes or disruptions.
- External economic factors such as inflation, currency fluctuation, and global supply chain issues are not explicitly modeled.
- The accuracy of the chosen forecasting method depends on data availability and quality.
- The research focuses primarily on XCMG equipment sales, limiting its generalizability to other product lines.

3.2. Literature Review

A well-structured demand forecasting system plays a crucial role in ensuring the efficient management of sales and inventory. Various studies have highlighted the importance of forecasting methods in improving operational efficiency in industries reliant on heavy machinery and construction equipment.

Demand forecasting is essential for companies operating in capital-intensive industries like construction equipment. According to Chopra & Meindl (2019), accurate demand forecasting reduces inventory costs, improves cash flow, and enhances customer satisfaction. Traditional methods such as moving averages and exponential smoothing have been widely used due to their simplicity and effectiveness in short-term forecasting (Makridakis et al., 2020).

Forecasting techniques vary in accuracy depending on market conditions and data availability. The moving average method is widely used for smoothing fluctuations, but it does not react well to trends or seasonal variations (Hyndman & Athanasopoulos, 2018). On the other hand, exponential smoothing assigns greater weight to recent data points, making it more adaptive to market shifts (Armstrong, 2017). To evaluate forecasting accuracy, researchers emphasize

using Mean Absolute Deviation (MAD), Mean Absolute Percentage Error (MAPE), and Mean Absolute Scaled Error (MASE) (Silver et al., 2016).

The construction equipment market in Bangladesh faces unique challenges, including supply chain disruptions, regulatory constraints, and currency fluctuations. A study by Rahman & Hossain (2021) highlights that businesses in Bangladesh often struggle with inconsistent demand forecasting due to limited data availability and economic instability. Furthermore, Islam et al. (2022) found that firms relying on traditional forecasting methods without integrating real-time market intelligence experience inefficiencies in procurement and inventory management.

Research in operations management suggests that businesses like EMSL can optimize their forecasting by integrating data-driven models and machine learning techniques (Choi et al., 2021). Studies emphasize the importance of incorporating both quantitative and qualitative factors in forecasting to account for macroeconomic trends, customer preferences, and supplier constraints (Slack et al., 2020).

This literature review establishes the theoretical foundation for the forecasting analysis conducted in this report and underscores the relevance of applying robust forecasting techniques to EMSL's sales and inventory management.

3.3. Methodology

3.3.1. Forecasting methods:

I have used 03 (Three) different forecasting method to calculate the forecasting of EMSL.

- **Moving Average Method (3-period)**
 - The 3-period moving average method smooths out short-term fluctuations by averaging sales data from the last three periods to forecast the next period.
- **Weighted Moving Average Method (3-period)**
 - The weighted moving average method assigns different weights to the sales data from the last three periods, giving more importance to recent periods.

- **Exponential Smoothing Method**

- The exponential smoothing method applies decreasing weights to past sales data, placing more emphasis on recent observations.

To identify the forecasting method that provides the most accurate and least biased results, we calculated the following error metrics for each method:

- Mean Absolute Deviation (MAD)
- Mean Absolute Scaled Error (MASE)
- Mean Absolute Percentage Error (MAPE)

Additionally, we assessed the bias in each forecasting method using metrics such as the tracking signal and control charts to determine whether errors were within acceptable limits and to identify any trends or cyclic patterns.

3.3.2. Evaluation Criteria

- **Mean Absolute Deviation (MAD):** Measures the average magnitude of the forecast errors, regardless of direction.
- **Mean Absolute Scaled Error (MASE):** Scales the error based on a benchmark method, helping to compare different forecasting methods.
- **Mean Absolute Percentage Error (MAPE):** Represents the size of the error in percentage terms relative to the actual sales.

3.3.3. Bias Assessment

- **Tracking Signal:** Indicates the presence of bias in the forecast. A tracking signal within the range of ± 4 suggests an unbiased forecast.
- **Control Chart:** Helps identify whether the forecast errors are within control limits, indicating the stability and reliability of the forecasting process.

3.4. Data collection, analysis and findings

Table 5: Three Period Moving Average forecast and forecasting error for sales

Quarter	Sales	3 period Moving Average Forecast	Error	Error	Error ²	(Error /Actual) X100
Q1	61,928,800					
Q2	41,755,000					
Q3	107,900,893					
Q4	178,803,064	70,528,231	108,274,833	108,274,833	11,723,439,461,177,900	60.6%
Q5	192,132,236	109,486,319	82,645,917	82,645,917	6,830,347,596,770,890	43.0%
Q6	378,593,973	159,612,064	218,981,909	218,981,909	47,953,076,323,296,300	57.8%
Q7	149,905,855	249,843,091	-99,937,236	99,937,236	9,987,451,219,269,490	66.7%
Q8	192,168,550	240,210,688	-48,042,138	48,042,138	2,308,046,982,615,090	25.0%
			261,923,285	557,882,033	78,802,361,583,129,700	253%

We know that,

$$MAD = \frac{\sum |e|}{n}$$

$$MAD = \frac{557,882,033}{5}$$

$$MAD = 111,576,407$$

$$MASE = \frac{\sum |e|^2}{n - 1}$$

$$MASE = \frac{78,802,361,583,129,700}{4}$$

$$MASE = 19,700,590,395,782,400$$

$$MAPE = \frac{\left[\frac{|e|}{Actual} * 100 \right]}{n}$$

$$MASE = \frac{253\%}{5}$$

$$MAPE = 51\%$$

$$Tracking\ Signal = \frac{\Sigma(Actual - Forecast)}{MAD}$$

$$Tracking\ Signal = \frac{261,923,285}{111,576,407}$$

$$Tracking\ Signal = 2.3474$$

Let's check the control chart for Three Period Moving Average Forecasting.

Table 6: Control Chart of Three period moving average forecasting

Control Charts				
Quarter	Error	MAD	UCL	LCL
Q4	108,274,833	111,576,407	280,717,583	-280,717,583
Q5	82,645,917	111,576,407	280,717,583	-280,717,583
Q6	218,981,909	111,576,407	280,717,583	-280,717,583
Q7	-99,937,236	111,576,407	280,717,583	-280,717,583
Q8	-48,042,138	111,576,407	280,717,583	-280,717,583

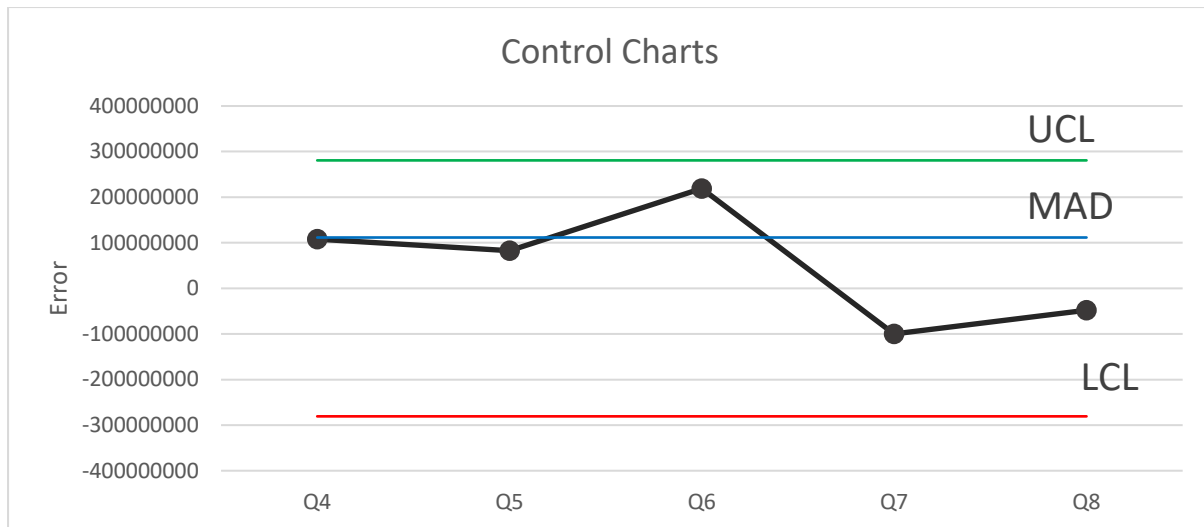


Figure 6: Control chart of three period moving average forecasting

Now, Let's check the Three Period Weighted Average Forecasting and Forecasting Error.

Table 7: Three period weighted moving average forecasting and forecasting error

Quarter	Sales	3 period weighted Average Forecast	Error	Error	Error ²	(Error /Actual) X100
Q1	61,928,800					
Q2	41,755,000					
Q3	107,900,893					
Q4	178,803,064	75,555,412	103,247,652	103,247,652	10,660,077,674,487,400	57.7%
Q5	192,132,236	126,577,691	65,554,545	65,554,545	4,297,398,324,268,840	34.1%
Q6	378,593,973	170,620,757	207,973,216	207,973,216	43,252,858,490,193,400	54.9%
Q7	164,024,510	273,374,183	-109,349,673	109,349,673	11,957,351,050,816,700	66.7%
Q8	195,796,294	244,745,367	-48,949,073	48,949,073	2,396,011,791,172,950	25.0%
			218,476,666	535,074,159	72,563,697,330,939,300	238%

We know that,

$$MAD = \frac{\Sigma|e|}{n}$$

$$MAD = \frac{535,074,159}{5}$$

$$MAD = 107,014,832$$

$$MASE = \frac{\Sigma|e|^2}{n-1}$$

$$MASE = \frac{72,563,697,330,939,300}{4}$$

$$MASE = 18,140,924,332,734,800$$

$$MAPE = \frac{\left[\frac{|e|}{Actual} * 100 \right]}{n}$$

$$MAPE = \frac{[238\%]}{5}$$

$$MAPE = 48\%$$

$$Tracking\ Signal = \frac{\Sigma(Actual - Forecast)}{MAD}$$

$$Tracking\ Signal = \frac{218,476,666}{107,014,832}$$

$$Tracking\ Signal = 2.0416$$

Let's check the control chart for Three Period Weighted Average Forecasting.

Table 8: Control chart of three period weighted moving average forecasting

Control Charts				
Quarter	Error	MAD	UCL	LCL
Q4	103,247,652	107,014,832	269,376,497	-269,376,497
Q5	65,554,545	107,014,832	269,376,497	-269,376,497
Q6	207,973,216	107,014,832	269,376,497	-269,376,497
Q7	-109,349,673	107,014,832	269,376,497	-269,376,497
Q8	-48,949,073	107,014,832	269,376,497	-269,376,497

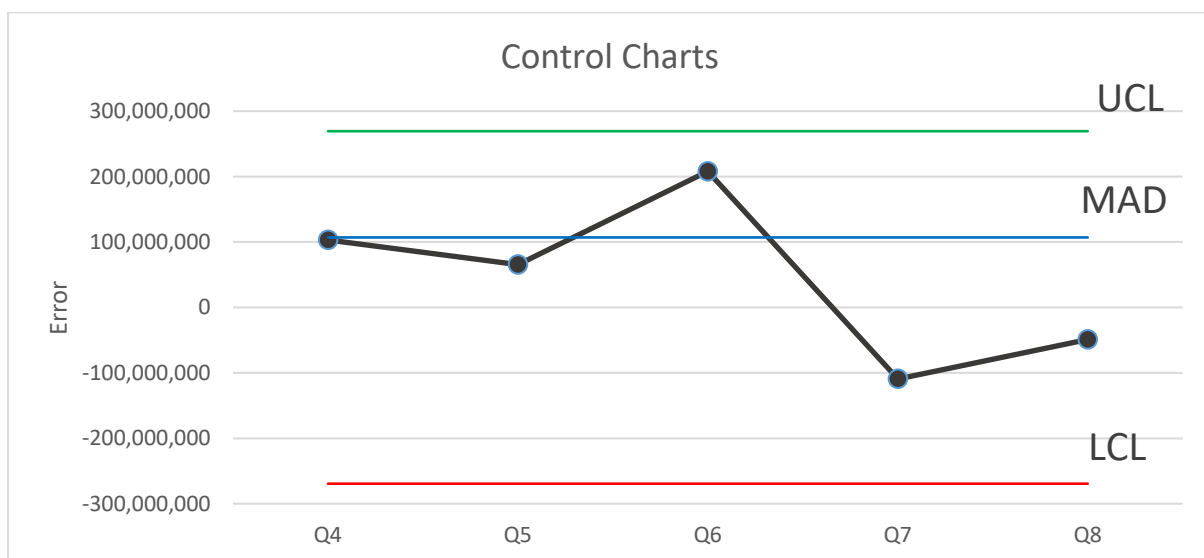


Figure 7: Control chart of three period weighted moving average forecasting

Now, Let's check the Exponential Smoothing Method Forecasting and Forecasting Error.

Table 9: Exponential Smoothing method forecasting and forecasting error

Quarter	Sales	Exponential Smoothing method ($\alpha=.9$)	Error	Error	Error2	(Error /Actual) X100
Q1	61,928,800					
Q2	41,755,000					
Q3	107,900,893					
Q4	178,803,064	107,900,893	70,902,171	70,902,171	5,027,117,852,513,240	39.7%
Q5	192,132,236	171,712,847	20,419,389	20,419,389	416,951,451,217,199	10.6%
Q6	378,593,973	190,090,297	188,503,676	188,503,676	35,533,635,831,582,300	49.8%
Q7	215,846,163	359,743,605	-143,897,442	143,897,442	20,706,473,861,226,600	66.7%
Q8	184,188,726	230,235,907	-46,047,181	46,047,181	2,120,342,923,389,600	25.0%
			89,880,612	469,769,860	63,804,521,919,929,000	192%

We know that,

$$MAD = \frac{\sum |e|}{n}$$

$$MAD = \frac{469,769,860}{5}$$

$$MAD = 93,953,972$$

$$MASE = \frac{\sum |e|^2}{n - 1}$$

$$MASE = \frac{63,804,521,919,929,000}{4}$$

$$MASE = 15,951,130,479,982,200$$

$$MAPE = \frac{\left[\frac{|e|}{Actual} * 100 \right]}{n}$$

$$MAPE = \frac{192\%}{5}$$

$$MAPE = 38\%$$

$$Tracking\ Signal = \frac{\Sigma(Actual - Forecast)}{MAD}$$

$$Tracking\ Signal = \frac{89,880,612}{93,953,972}$$

$$Tracking\ Signal = 0.9566$$

Let's check the control chart for Exponential Smoothing Method Forecasting.

Table 10: Control chart of exponential smoothing method forecasting

Control Charts				
Quarter	Error	MAD	UCL	LCL
Q4	70,902,171	93,953,972	252,595,570	-252,595,570
Q5	20,419,389	93,953,972	252,595,570	-252,595,570
Q6	188,503,676	93,953,972	252,595,570	-252,595,570
Q7	-143,897,442	93,953,972	252,595,570	-252,595,570
Q8	-46,047,181	93,953,972	252,595,570	-252,595,570

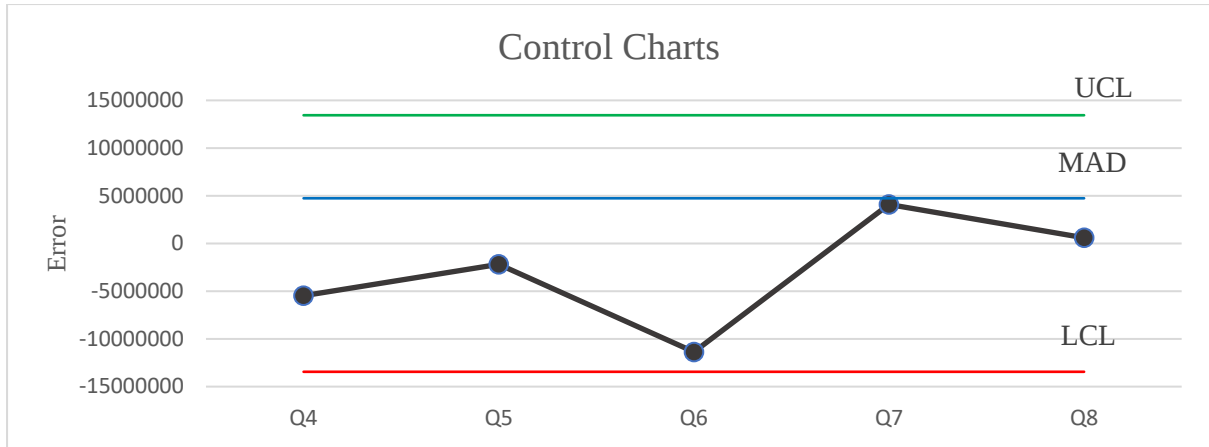


Figure 8: Control chart of exponential smoothing method forecasting

3.5. Analysis:

Table 11: Comparison of MAD, MAPE, Tracking Signal and Standard Deviation of Different Forecasting Method

Method/Metrics	MAD	MAPE	Tracking Signal	Standard Deviation
3-Period Moving Average	111,576,407	51%	2.3475	140,358,791.658
3- period weighted Moving Average	107,014,832	48%	2.0416	134,688,248.681
Exponential Smoothing Method	93,953,972	38%	0.9566	126,297,784.937

1. **Mean Absolute Deviation (MAD):**

- The Exponential Smoothing method has the lowest MAD (93,953,972), indicating it has the smallest average error magnitude.

2. **Mean Absolute Percentage Error (MAPE):**

- The Exponential Smoothing method also has the lowest MAPE (38%), indicating it has the smallest average error relative to actual sales.

3. **Tracking Signal:**

- All methods show a positive tracking signal, indicating a tendency to overestimate sales or underestimate the forecasting. However, the Exponential Smoothing method has the smallest absolute tracking signal (0.9566), suggesting it is the least biased.

4. **Standard Deviation:**

- The Exponential Smoothing method has the lowest standard deviation (126,297,784.937), indicating the least variability in forecasting errors.

3.6. **Recommendation:**

Based on the analysis of these metrics, the **Exponential Smoothing method** is recommended as the best forecasting method. It consistently shows the lowest error magnitudes (MAD and MAPE), the least bias (tracking signal), and the lowest variability in errors (standard deviation). This method provides more accurate and reliable forecasts compared to the other methods evaluated.

Conclusion

EMSL's operational strategies play a pivotal role in maintaining its market leadership. By addressing challenges such as supply chain disruptions, high operational costs, and inventory optimization, EMSL can enhance efficiency and maintain a competitive edge. The integration of advanced forecasting techniques, automation, and sustainability practices will further strengthen the company's position in the industry.

Through this internship, I have gained a practical understanding of how strategic management principles apply in a corporate setting. The insights and experiences acquired during this period will be invaluable as I continue my career in operations and sales management. Overall, EMSL serves as a strong example of how effective operations management can drive growth and success in a competitive market.

Overall, the report will be a valuable resource for understanding the current condition of Earthmoving Solution Limited. It provides an insightful commendation for future growth and success. By maintaining a focus on veracity, affiliation, collaboration and strategic foresight, the business has poised to continue delivering value to its clients and achieved sustainable growth in this fast-changing industry.

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