

**Modernizing Traditional Shipbuilding Through Vendor Managed Inventory:
A Study on M/S Brothers Water Navigation Co in Bangladesh**

Internship Organization
M/S Brothers Water Navigation Co

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Internship Report Approval Form

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Letter of Transmittal

December, 2025

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Subject: Submission of Project report on “**Modernizing Traditional Shipbuilding Through Vendor Managed Inventory: A Study on M/S Brothers Water Navigation Co in Bangladesh.**”

Dear Sir,

With due respect, I would like to inform you that I have completed report paper titled “Modernizing Traditional Shipbuilding Through Vendor Managed Inventory: A Study on M/S Brothers Water Navigation Co in Bangladesh” has been prepared for the fulfillment of my Project according to the prerequisites of my undergraduate program Bachelor of Business Administration (BBA) in 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 some experience gathered from the internet for taking relevant information regarding the Project. I hope that it will find your acknowledgement. I am looking forward to your valuable feedback.

Sincerely,

Sazzadul Haque Jony

ID: 182011111

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List of Abbreviations

Abbreviation	Full From
BBA	Bachelor Of Business Administration
ERP	Enterprise Resource Planning
GPS	Global Positioning System
SCM	Supply Chain Management
SKU	Stock Keeping Unit
ULAB	University Of Liberal Arts Bangladesh
USB	ULAB School Of Business
VMI	Vendor Managed Inventory
SLA	Service Level Agreement

PART A

Chapter 1: Internship Preparation

1.1 Motivation and Learning Expectations

As a Supply Chain Management student, I have always been eager to learn and understand the dynamic of supply chain. My studies have guided and provided me with knowledge of logistics, procurement, and modern supply chain management and analysis. Bangladesh has many traditional businesses that are still rooted with traditional processes, among them the shipbuilding process provides me with a unique chance to develop and renowned large scale shipbuilding industry here.

Joining **M/S Brothers Water Navigation Co** was driven by my desire to gain hands-on experience on inventory management, vendor coordination, procurement and logistics in the shipping industry. Furthermore, I wanted to explore how the traditional business operated and how modern practices on supply chain management could be applied to bring efficiency and profitability to this traditional business.

1.2 Internship Search Process

Before starting my internship at M/S Brothers Water Navigation Co, I explored other internships for supply chain management within other traditional manufacturing industries. My goal was to learn the basic foundations of supply chain management in a company with large scale manufacturing operations, where I could observe and analyze how modern management practices could be tailored for that industry.

Using personal contacts and advice from professors, I came across M/S Brothers Water Navigation, located at Janata dockyard in Rupganj, Narayanganj. After expressing my interest and discussing possible responsibilities with the management team, I found their support for applying supply chain modernization research aligned well with my academic goals. This led to my appointment as a Logistics and Vendor Management Intern.

1.3 Internship Interview Experience

The interview with M/S Brothers Water Navigation was informal but informative. The management emphasized my interest in applying theory to real-world problems and my academic experience in supply chain management. The owner and procurement supervisor were particularly curious about how I could assist in finding ways to improve cost control, material sourcing, inventory management and real-time data representation.

The interview focused on practical exposure rather than a technical exam. The organization agreed to grant me access to operational data and staff interviews. This encouraging exchange gave me confidence that the internship would provide worthwhile practical experience.

1.4 About the Organization

M/S Brothers Water Navigation is a traditional shipbuilding and water transport company located at Janata Dock Yard, Dakkinpara, Rupganj, Narayanganj. The company specializes in building vessels that are about 35,000 feet in size, which it either sells to customers or utilizes for local waterway cargo transportation.

Depending on the design, the cost of materials and the availability of resources, the shipbuilding process usually takes 3-4 months. Purchasing raw materials (mostly steel and welding components), managing inventory, negotiating with vendors, and coordinating with experienced workers in the shipyard as a part of operations.

The company has built its reputation on dependability and practical experience rather than relying on digital tools or automation. However, the absence of modern management systems and structured documentation presents challenges in improving efficiency and scaling up. This makes the organization an ideal case to study how supply chain innovations and technology can enhance performance, reduce waste, and increase profitability.

Mission: To contribute to Bangladesh's inland shipbuilding sector by producing reliable and quality vessels for trade and transport.

Vision: To evolve gradually from a traditional shipyard into a semi-modern, process-oriented marine manufacturer through improved supply chain management and sustainable practices.

Core Values: Commitment to quality and timely delivery, fostering long-term relationships with clients and suppliers, and maintaining transparency, safety, and teamwork.

Chapter 2: About the Internship

2.1 Department Activities

During my time at M/S Brothers Water Navigation Co, I was assigned to the Procurement and Operations Department. This team takes care of sourcing materials, handling vendor relationships, managing inventory, and supporting shipbuilding operations at the dockyard.

Their main tasks include:

- Procuring large quantities of steel materials such as steel plates, angle bars, T-guards, L-guards, flat bars, pipes and welding components essential for ship construction.
- Keeping track of local metal price trends to prepare estimated project budgets.
- Coordinating shipments with transporters and logistics partners to ensure timely delivery to the dockyard.
- Recording and managing the flow of inventory through the entire shipbuilding cycle.
- Communicating and maintaining relationships with the different vendors in Narayanganj, Dhaka, and Chittagong.

A significant amount of procurement is required on a weekly basis. For example, a 40,000 ft ship requires approximately 330 tons of steel, while a 30,000 ft ship uses about 230 tons. Each ship requires various different materials such as steel plates, T guards, L guards, L guards and wiolding components such as acetylene gas and Vortic marine welding rods. Effective coordination to make sure materials are available is essential to prevent delays, control budget and project timeline.

Observing these processes gave me valuable insights into large-scale procurement logistics and how raw material management impacts production efficiency.

2.2 Work Environment

The Janata Dock Yard offers a blend of traditional shipbuilding craftsmanship and hands-on logistics operations. The dockyard environment is physically intense but teamwork-oriented. Communication happens mostly in person or by phone, and records are usually handwritten. Although the system is simple, the workers are highly experienced and follow their routines with discipline. Employees take pride in their craft and work closely to meet tight deadlines.

This experience helped me understand how large-scale projects are run without significant automation, relying instead on coordination, skills, and managing resources effectively.

2.3 Intern Duties and Responsibilities

Working as a Logistics and Vendor Management Intern, I supported the Procurement and Logistics team by managing records of material movements for shipbuilding and operational projects. My responsibilities included:

- Monitoring material and inventory inflows and outflows by tracking incoming shipments and recording usage for ongoing builds.
- Comparing material consumption recording it against projected requirements.
- Observing how materials were allocated between new ship builds and repair work of existing ships.
- Coordinating with vendors by requesting quotations and preparing comparative cost analysis.
- Assisting in evaluating supplier reliability and on-time delivery.
- Documenting transportation logistics, including scheduling for loading and unloading heavy materials.
- Observing the company's fleet operations, which involve transporting river sand between Chandpur and Bosila, and recording maintenance activities.
- Collecting secondary data on procurement timelines, vendor performance, and price fluctuations through interviews and records.

These tasks gave me hands-on experience in managing logistics flow, supplier relations, and material planning all key areas to understand supply chain management.

2.4 Connecting Academic Learning with Internship

The internship helped me apply academic concepts, knowledge and theories to practical challenges in a traditional industry such as:

- Procurement and sourcing concepts helped me analyze supplier costs and relationships.
- Inventory management principles such as Economic Order Quantity (EOQ) and reorder points enabled me to study how procurement timing affected project budgets.
- Logistics optimization theories helped me learn and execute transporting heavy materials through local supply chains and waterways.
- Risk and cost analysis frameworks guided my understanding of how metal price changes impact profitability.

Overall, this hands-on experience gave me a better perspective on how modern supply chain methods could help improve productivity and profitability in Bangladesh's traditional shipbuilding sector.

Chapter 3: Self-Reflection

3.1 Feedback on Internship

The internship offered valuable exposure to supply chain tasks. During my internship at M/S Brothers Water Navigation Co, I had the valuable chance to put my knowledge and understanding of supply chain management to use in practical scenarios. I worked in procurement, coordination, inventory management and tracking, vendor management, communication, and logistical support as an intern in Logistics and Vendor Management.

To ensure efficient shipbuilding progress , I took part in the purchase of raw materials and made sure that necessary production supplies including steel plates, angles, pipes, flat bars, welding rods, and cutting gas were delivered on schedule. Along with keeping track of supplies and daily usage, I also assisted in organizing the dockyard's inventory receipt and recording.

Additionally, I also created a structured documentation procedure and kept track of daily wages and procurement transactions. Using my Excel skills, I created a monthly cost-tracking dashboard, which helped visualize procurement expenses, material usage, and supplier performance.

Logistics routing across rivers was another important subject I learned. I observed how the company's ships move goods and river sand from Chandpur to Bosila, understanding how weather, water levels, and navigation schedules impact supply timetables. This provided me with useful insight into the difficulties of inter waterway logistics in Bangladesh and helped me understand the coordination between suppliers, buyers, and transport routes and gave me practical insight into the challenges of waterway logistics in Bangladesh.

Overall, I learned how traditional shipyards rely heavily on experience, coordination, and manual methods. It also made me realize how structured documentation and basic digital tools could significantly improve accuracy,efficiency and profitability, while providing more insight data for the management to strategize growth accordingly.

3.2 How I Could Do Better and How the Organization Could Utilize Me Better

I believe I could have focused more on data analysis and cost forecasting to perform better, to provide deeper insights into procurement and logistical efficiency. While I successfully built the cost dashboard, developing automated reports and predictive summaries would have added more value to decision-making.

Additionally, I would have liked to design and develop a basic inventory tracking model using Excel or Power Query to automate updates and flag shortages early. This could have helped develop a real-time tracking system plus act as an alert system to automatically create new purchase orders.

From the company standpoint, my function may have been better utilized with more exposure to supplier negotiations, project budgeting, and logistical planning. Access to such discussions would have helped me improve my grasp of cost management and control, risk management, and operational decision making.

The organization provided an outstanding learning atmosphere that encouraged and facilitated my observation and participation, considerably improving my understanding of supply chain coordination in traditional industries.

3.3 Recommendations

To further improve operations and intern engagement, the following recommendations can be implemented:

3.3.1 Process Improvement

- The company would greatly benefit from using a digital inventory system to track and maintain material inflows and outflows more accurately and effectively.
- Using monthly procurement and dashboards for management to review costs and material utilization, while utilizing modern resources to speed up manual and hectic processes.
- Establishing a standard documentation process for wage payments and supplier transactions to ensure transparency and financial accuracy.

3.3.2 Training and Collaboration

- It would greatly increase technical literacy by short training on data management tools like Excel or Google Sheets for employees, helping bridge the digital knowledge gap and execution.
- Ensuring cross-departmental communication between departments such as procurement, operations, and finance to improve project planning and reduce material delays while shipbuilding.

3.3.3 Logistics Optimization

- Using and implementing modern waterway routing tools or GPS-based tracking for the company's transport ships to enhance scheduling and real-time delivery tracking.

- Keeping and maintaining supplier performance and tracking records to help evaluate consistency, pricing, and delivery timelines to ensure proper supplier evaluation.

Chapter 4: Personal Development Plan

4.1 Technical Skills

Through my internship at M/S Brothers Water Navigation Co, I was able to develop my technical and analytical skills, especially in the areas of data management, inventory tracking, and cost analysis.

1. Advanced Excel Proficiency

I used Microsoft Excel to document procurement transactions, daily wage payments, and material inflows and outflows. I also designed a monthly cost dashboard that summarized total procurement expenses, vendor costs, material cost tracking and shipbuilding material usage. This greatly enhanced my ability to apply formulas and data visualization techniques to real-world supply chain data.

2. Inventory Control and Documentation

Managing shipbuilding materials such as steel plates, angles, and pipes. This improved my understanding of inventory categorization and material flow management. I learned to record and update material use, and maintain clear records for ongoing projects.

3. Procurement and Vendor Coordination

I gained real world experience in communicating with suppliers, comparing quotation prices with different vendors, verifying and receiving deliveries. This strengthened my understanding of procurement cycle stages, cost negotiation, and local sourcing practices.

4. Cost Tracking and Budget Monitoring

By creating and maintaining a monthly expense report taught me how to understand and analyze the spending patterns. This enhanced my ability to interpret real-time financial data and assess operational efficiency.

5. Waterway Logistics and Transport Coordination

My time at M/S Water Navigation Co provided me with valuable technical insight into waterway logistics. I learnt essential parts of logistical challenges such as route planning, fuel management, and coordination between suppliers and buyers in between transport. This gave me a clear understanding of Bangladesh's inland water transport system and its role in supply chain efficiency.

These skills helped me connect my theoretical knowledge with practical, data-driven supply chain management experience and helped me hone my skills as a supply chain graduate.

4.2 Interpersonal Skills

My internship also allowed me to grow essential interpersonal and professional skills that are crucial for a successful career in supply chain and operations management.

1. Communication and Coordination

By working closely with the dockyard supervisors, procurement team, and suppliers I gained experienced insight into shipbuilding, team communication and coordination. This greatly helped me improve my communication clarity and negotiation skills. Regular coordination between multiple parties taught me professionalism and to manage time effectively under pressure.

2. Adaptability and Problem Solving

The harsh shipyard environment required working under the sun in tight and narrow spaces. More often sudden problems require fast responses to unexpected delays or shortages. These experiences helped me develop my adaptability, decision-making, and problem-solving capabilities, especially in managing logistical disruptions.

3. Leadership and Initiative

This active contribution was appreciated by the management team and showed me the value of taking ownership within a team-oriented work environment.

By taking initiative to develop the monthly cost and inventory dashboard, I independently recorded and managed data documentation and contributed to enhancing the ease of manual process and automating the need to manually calculate the cost and inventory information. This earned the appreciation of the management showing me the value of taking ownership with my working environment.

4. Teamwork and Collaboration

I assisted and coordinated daily with administrative and technical staff such as day laborers, welders, and fitters, which helped me understand the importance of team cooperation in achieving production timelines. Learning from experienced workers also deepened my appreciation for the value of experience-based knowledge in traditional industries.

5. Professional Ethics and Responsibility

I learned the importance of confidentiality, accuracy, and accountability in managing procurement and financial records. Maintaining accuracy in cost documentation and vendor coordination strengthened my understanding of ethical practices in supply chain operations.

4.3 Future Development Goals

In the future I aim to keep improving on both my personal and technical skills so that I can build a strong foundation in Supply Chain Management. I aim to do that by:

- Learning advanced Data Analytics and Dashboard tools such as Power BI, Looker Studio and SQL.
- Gaining more knowledge on marine transportation and shipping. While gathering greater knowledge of import and export documentation and Incoterms to develop better as a supply chain professional.
- Developing an expertise in procurement and vendor through ERP management systems (ERP) to handle complex supply networks.
- Achieving professional certification in Supply Chain Management and Project Management.
- Improving negotiation and leadership skills through practical project management experiences.

These goals will support my long-term aspiration to become a Supply Chain Analyst, contributing to the modernization of Bangladesh's traditional industries through process improvement and data-driven thinking.

Part B

Executive Summary

The study has explored how Vendor-Managed Inventory (VMI) can be integrated into the traditional shipbuilding industry in Bangladesh for better efficiency in procurement, cost reduction, and improvement in vendor collaboration. Shipbuilding in Bangladesh is highly material-intensive, with a weekly requirement for the purchase of building materials. The current practices are manually intensive. This research work is using observations, informal interviews with shop floor personnel, their supervisors, procurement personnel, as well as secondary data to understand the current practices of procurement and inventory, to identify the current operational and technological gaps, as well as their readiness levels for VMI implementation. It is found that current practices are experience-based and are no strangers to the shop floor personnel, but they lack real-time visibility, which is critical for inventory management practices as well as VMI implementation. A step-by-step process for VMI implementation is discussed below, which is applicable to conventional shipyards. These practices include collaboration between suppliers, information-based inventory visibility, vendor-controlled inventory replenishment, and monitoring.

Furthermore, it is discovered that both employees and managers exhibit a positive attitude with regard to improvement if digital systems are easy to use. Concerns regarding digital literacy and resistance to change highlight the need for customized, gradual implementation supported by basic training. The steps to integrate and create concludes with testing for the pilot VMI program on selected materials, digitizing inventory records, and formalizing vendor agreements to modernize Bangladesh's shipbuilding supply chain while respecting its traditional foundations.

Chapter 1: Introduction

1.1 Background of Study

The shipbuilding and inland waterway logistics of Bangladesh have always been an important part of its economy, as a country in a river delta waterway transport has been an essential part of its history. The industry has become an important contributor to regional maritime logistics and shipbuilding hubs. However, in the modern era the industry still relies on traditional operational methods especially in procurement, inventory management, planning and vendor management.

As global practice in shipbuilding moves towards leaner and more efficient methods such as Vendor Managed Inventory (VMI), Digital Procurement and Management systems (ERP) for real-time visibility and ease of management and planning. These traditional businesses lack transitions to modern and more effective systems. These lead to inefficient practices that lead to materials storages, overstocking errors, delay in production times, and more volatility to fluctuating steel prices, manual recording and documentation error and limited forecasting capability that affect production and cost efficiency.

Vendor Managed Inventory (VMI) is a supply chain collaboration technique in which the supplier or vendor takes full responsibility for managing and replenishing inventory at the buyer's location. The buyer provides data, but the vendor makes replenishment decisions. Introducing Supply Chain Management (SCM) models can help revolutionize planning, information sharing, vendor management and easier documentation by using digital inventory systems that track, visualize and communicate inventory real-time thus automating procurement and inventory management. These systems can improve operational efficiency for a resource intensive industry such as shipbuilding.

This study therefore examines how the VMI framework can be integrated into the shipbuilding industry to improve procurement, inventory management, logistics and vendor management. Using the operational realities of M/S Brothers Water Navigation Co and the insights obtained from workers, procurement staff, and field observations to explore potential improvement and practical pathways to modernization.

1.2 Research Questions

This study is guided by the following research questions, developed based on the operational realities of M/S Brothers Water Navigation Co and the insights obtained from workers, procurement staff, and field observations:

1. How is buying materials (procurement) and keeping stock handled in the shipyard right now, based on what workers and staff do every day?
2. What are the operational and technological bottlenecks in the existing processes that limit VMI implementation?
3. How do workers and supervisors perceive the use of digital systems and VMI?
4. What are the customizations suited to their skill levels, work culture and operational needs that can make the adoption of digital systems and VMI easier for them?
5. Do you think that the improved process will make work easier and make work convenient ?
6. What improvements are expected from VMI adoption in regards to inventory management and production efficiency?

1.3 Research Objectives

1. To understand how VMI can be applied to the shipbuilding industry.
2. To identify bottlenecks to VMI integration including technology, skills and vendor willingness.
3. To explore how VMI can be adopted and using digital systems can be applied to improve processes.
4. To assess how the VMI concept is viewed by the staff , and how its acceptance can be increased by customized it to their familiarity.
5. To develop and implement a run and a practical pilot version of the model to combine traditional process familiarity with VMI concept for easier transition and acceptance.

Chapter 2: Literature Review

2.1 Shipbuilding Process in Bangladesh

Shipbuilding is a resource intensive industry that requires continuous coordination of labour, equipment, material and a great amount of coordination with suppliers. Compared to global shipyards that practice modern SCM models to ensure planned and timely procurement with demand forecasting and market data to ensure cost reduction through structured contracted vendors that ensure real-time inventory tracking.. However, in Bangladesh traditional shipyards rely mostly on manual coordination, verbal communication and experienced workers.

The introduction of VMI enable improvements such as -

- Reducing Stockouts
- Reducing Inventory Costs
- Inventory Management
- Improving Service Levels
- Strengthen supplier and buyer relationships

Vendor Managed Inventory (VMI) can help strengthen the supply chain by shifting inventory responsibility on suppliers and vendors. This improves visibility and reduces delays (Pol & Inamdar, 2012). Literature review shows that integrated supply chains reduce material shortage, logistical disruptions and improve plan against key challenges faced in traditional practices.

2.2 Traditional Procurement and Vendor Management

In Bangladesh the traditional shipyards run procurement on need based purchasing. Orders are placed when stock runs out or is near depletion. Inventory is recorded manually and needs to be checked physically to be updated thus much of the procurement decisions are based on past experience and personal judgement.

Study shows that these systems lead to various inefficiencies such as :

- Overstocking, which can lead to extensive holding costs and cause cashflow to be withheld (Mittal et al., 2012).
- Understocking, resulting in project delay and volatility to price fluctuations.
- Lack of forecasting causing project cost overruns and loss of productivity

Supplier communication is informal, lacking proper communication standards or structured contracts to ensure efficiency for both parties. As stated by Zachariassen et al. (2014), who explain that weak information flow limits collaboration and reduces supply chain efficiency. These highlight the need for implementation of better communication and process to align suppliers and buyers to increase supply chain efficiency.

2.3 Technological Barriers

Despite the potential for modernization, Bangladeshi shipyards face several technological barriers that restrict advancement in supply chain practices.

1. Absence of Digital Management Systems

Data is maintained through hand written records making coordination difficult and time consuming, this lack of real time data sharing limits visibility of material usage and stock levels. This bottlenecks decision making and creates difficulty in coordination between buyers and suppliers to ensure proper transparency and increase adaptation. As Pol & Inamdar, 2012 emphasize, The presence of structured information systems can help create better and accurate sharing of data to implement VMI. In absence of such systems, suppliers are unable to monitor inventory levels and planned inventory needs. As a result this serves as a major bottleneck to VMI adaptation in traditional shipyards

2. Limited Digital Literacy Among Workers

Workers and supervisors often do not have formal training in digital tools, making it difficult to adopt even basic inventory systems. As stated by Watson et al. (2012), training and capacity building are essential before implementing VMI or digitized systems in developing sectors.

3. Cultural Resistance to Change

Since traditional methods have been used for decades, introducing digital processes is often met with resistance. Suppliers in VMI networks also resist change when trust and familiarity outweigh structured systems (Bogaert & Jaarsveld, 2021). Adaption is key to modernization of existing systems in order to create improvements for existing challenges and increase efficiency.

These barriers demonstrate that modernization requires not only technology but also cultural acceptance, training, and planned implementation.

2.4 Integration of Digital Recording Systems

Digital systems can significantly improve shipyard procurement and inventory processes. Based on VMI and SCM models, the following improvements

1. Real-Time Stock Visibility

Digitizing logs with daily updates can allow supervisors and managers to get an exact visualization of inventory usage and stock patterns. Real-time tracking is essential to VMI model integration.

2. Automated Alerts and Reordering

Automating stock reorder by placing re-order levels and minimum buffer and safety stock levels can help ensure that alerts are shared with supervisors and procurement staff in time with the VMI integration, further also helping supplier alert suppliers to deliver stock and record usage patterns while reducing stockouts.

3. Improved Forecasting and Demand Planning

Digital data supports forecasting models that reduce overstocking and minimize emergency purchases. According to Bani-Asadi & Zanjani (2017), forecasting becomes significantly more accurate when data-sharing tools are present.

4. Foundational Support for VMI Implementation

Digital systems would allow suppliers to access real-time inventory data without physically visiting the site. This is essential as VMI is built on information transparency and automated procurement and inventory cycles (Bogaert & Jaarsveld, 2021).

5. Reduced Manual Errors

Digital systems eliminate losses, duplications, and errors common in handwritten logs. Studies show that poor documentation is a major cause of process delays in traditional industries (Watson et al., 2012).

Thus, introducing digital recording systems is the first step toward modernizing Bangladesh's traditional shipyards.

2.5 VMI Integration Steps

Step 1: Partnership Agreement & Contract Setup

A formal agreement is established that outlines:

- Products/SKUs included - ABC Category
- Minimum and maximum stock levels - Quantity
- Service level expectations - Z (95% or 99%)
- Frequency of replenishment - (daily Or weekly or Monthly)
- KPIs such as fill rate, OTIF (On-Time In-Full), Stock-out rate and inventory turnover

Step 2: Data Sharing and Visibility

The buyer gives the supplier continuous access to:

- Inventory levels
- Sales/POS data
- Planned promotions
- Forecasted demand
- Lead times and delivery constraint

Examples:

- Walmart shares real-time POS data with suppliers (a benchmark global practice).
- Toyota shares consumption data with Denso (global tier-1 supplier).

Step 3: Vendor Reviews Data and Performs Demand Planning

The vendor uses:

- Historical sales - weeks, months or years
- Seasonality patterns - like ice creams, winter coats
- Stock levels - average stocks to hold
- Forecast models - WAM or Exponential Smoothing
- Lead time data - Days between Order to Delivery

They then calculate:

- Quantity to replenish
- When to replenish
- Safety stock needed

Step 4: Vendor Creates Replenishment Orders

- Instead of the retailer placing an order, the supplier automatically generates a replenishment order.
- This order is then shared with the buyer for visibility.

Examples:

- P&G automatically dispatches Tide detergents to Walmart warehouses.
- Marico Bangladesh replenishes Parachute oil at retailers without waiting for an order request.

Step 5: Inventory Replenishment & Delivery

The vendor produces or picks goods and delivers them based on agreed lead times.

Delivery may be:

- Direct-to-store (DTS)
- Warehouse replenishment
- Cross-docking

Examples:

- Unilever delivers replenishment stock to Shwapno distribution centers every two days.

Step 6: Continuous Monitoring, Review, and Performance Tracking

Both parties monitor and review:

- Service levels
- Stock accuracy
- Shrinkage and wastage
- Replenishment cycle time
- Regular meetings are held to refine the process.

Examples:

- Amazon tracks vendor performance through Vendor Central dashboards.
- Rahimafrooz (Bangladesh) periodically reviews distribution inventory for battery products.

Chapter 3: Research Methodology

3.1 Research Design

This study follows a qualitative case study research design to examine the adoption potential of Vendor Managed Inventory (VMI) in a traditional shipbuilding environment. A qualitative approach was taken into the study to understand existing practices and operational challenges from the perspectives of workers, supervisors, procurement staff, and vendors.

Rather than measuring variables numerically, this study focuses on in-depth understanding through direct field engagement, making interviews and observations methods. Through a real-world insight into how traditional shipyards operate and how modern supply chain concepts such as VMI can be practically introduced.

3.2 Sampling Technique and Sample Size Determination

A purposive sampling technique was used to select participants who are directly involved in procurement, inventory handling, supervision, and vendor coordination. The aim was to gather insights from individuals with hands-on experience in daily shipyard operations. A total of 15 participants were interviewed, ensuring representation across operational and managerial roles relevant to VMI adoption.

3.3 Interview Design

Data was collected through open ended interviews rather than structured questionnaires. This method allowed participants to explain their experiences freely while still focusing on key research themes.

The interviews were designed to explore:

- Current procurement and inventory practices
- Challenges and delays in material availability
- Use of manual and digital record-keeping
- Perceptions of digital systems and VMI
- Willingness to adopt new processes

- Expectations from improved inventory management

Simple and clear language was used during interviews to match the educational background of participants. Interviews were conducted in Bangla, with responses later translated and summarized for analysis.

3.4 Data Recording and Interpretation Method

Interview responses were recorded through:

- Written notes taken during conversations
- Follow-up clarification discussions when necessary

The collected data was analyzed using thematic analysis, where recurring patterns and themes were identified across interviews. Observations from the dockyard were used to support and validate interview responses, ensuring consistency between what participants reported and what was observed in practice.

3.5 Pre-Interview Pretesting

Before conducting the full interviews, informal trial discussions were held with two staff members to ensure that:

- Questions were easy to understand
- Terminology was familiar to participants
- Interview flow felt natural and conversational

Minor adjustments were made to simplify wording and improve clarity.

3.6 Data Collection

Data was collected over the internship period through:

- Direct observation of procurement and inventory handling
- Informal and open ended interviews with staff and vendors
- Review of secondary documents such as handwritten inventory logs, purchase records, and material usage notes

This combination of sources helped improve the reliability of findings.

3.7 Ethical Consideration

Ethical guidelines were followed throughout the study. Participants were informed that:

- The study was conducted for academic purposes
- Participation was voluntary
- Individual identities would remain confidential

No personal names or sensitive information were recorded. All collected information was used only for research analysis.

Chapter 4: Data Analysis and Interpretation

The findings from the interview, observations and study have been outlined and detailed below, including the interview overview and the findings from the study.

4.1 Interview Overview

Question 1: Current Procurement and Stock Handling Practices

Interviews revealed that the procurement decisions are mainly made when materials appear to be low during work, Workers inform supervisors verbally and then supervisors inform and coordinate with the procurement department. Inventory levels are checked with physical inspection.

Observation shows that stock records maintained using handwritten ledgers are updated weekly, as material usage is recorded after work has been completed.

Question 2: Operational and Technological Challenges

Participants explained that they are well versed in manual record keeping and not used to digital tools for record keeping as such a shift to digital tools may help but fear lack of technical skills may cause them to become redundant. While all vendor communication is done verbally there are no structured methods to share information with suppliers and coordination depends on personal communication rather than data.

Observations show lack of real time inventory visibility to take planned decisions. These reliance on manual processes are identified as major barriers to adopting VMI.

Question 3: Perceptions of Digital Systems and VMI

Most interviewees expressed the need for digital systems to improve processes, however they shared their openness to adopt these systems if they were simple and easy to use. They also expressed that digital systems could reduce time consuming processes and repeated checking of inventory.

Question 4: Required Customizations for Adoption

Participants emphasized the want for systems with simple language, preferred in Bangla, with minimal and simple data entry processes that are easy to understand and input. Supervisors suggested that mobile based systems could make work more easy and convenient.

Observations showed that staff preferred systems that support their workflow rather than changing it. Gradual implementation and training were suggested to make adoption easier.

Question 5: Perceived Ease and Convenience of Improved

Interviewees believe that a simplified digital system combined with VMI would reduce repeated work and improve coordination. Procurement personnel expressed that VMI could reduce their workload and allow them to focus on planned purchasing rather than urgent purchases.

Question 6: Expected Improvements from VMI Adoption

Participants expected better inventory management and availability, minimizing stockouts while reducing inventory costs. Overall, interviews responses suggested that VMI could improve both process efficiency and productivity.

4.2 VMI Integration Steps**Step 1 - Partnership Agreement & Contract Setup.**

The initial to VMI involves establishing a basic agreement between buyers and suppliers. The agreement defines the materials outlining the minimum and maximum inventory levels in the VMI program, such as steel plates and welding rods, expectations and frequency of deliveries.

Step 2 - Data Sharing and Visibility

The buyers provide the suppliers with information of inventory usage and stock level data. In the context of this study, data can be shared using digital records such as excel based dashboards for simple use and sharing.

Step 3 - Vendor Reviews Data and Performs Demand Planning

Once data is available, suppliers can use historical data to detect consumption patterns and current stock levels to plan replenishment. In traditional shipyards, planning can be based on experience rather than data driven planning.

Step 4 - Vendor Creates Replenishment Order

Vendors use shared data to plan replenishment orders based on agreed stock levels. The buyer maintains usage and stock level transparency to ensure order trigger at proper intervals.

Step 5 - Inventory Replenishment & Delivery

Supplier delivers materials according to the agreed SLA of replenishment. Deliveries are aligned with buyer schedules to increase coordination.

Step 6 - Continuous Monitoring, Review, and Performance

The final step involves regular review of inventory accuracy, delivery performance, and system usability. In traditional settings, this review can be informal initially and gradually formalized as confidence in the system grows.

4.3 Customization for Easier Input, Management, and Adoption

Adopting VMI in a traditional shipyard must be adapted to local workforce capabilities, and operational realities. Literature emphasizes the importance of customized, user-friendly systems to ensure adoption (Zachariassen et al., 2014).

1. Simple Interfaces in Bangla and English

Most workers prefer Bangla, while supervisors sometimes use English. Using local language, bilingual interfaces improve usability and reduce training needs (Watson et al., 2012).

2. Mobile-Based Input

Nowadays as most workers use smartphones, mobile-based inventory entry can simplify real-time updates. This aligns with VMI principles that encourage decentralized, easy data collection (Pol & Inamdar, 2012).

3. Integration With Supplier Dashboards

For VMI implementation, suppliers need access to inventory data. Supplier dashboards allow them to execute:

- Monitoring Real-time Stock Update
- Planned Procurement
- Reduce need for Emergency Deliveries

4. Training Programs to Build Confidence

Successful implementation of collaborative systems requires training. Studies emphasize that skills development is just as important as the technology itself (Watson et al., 2012).

5. Gradual Implementation

Starting with a few SKUs can help easier adaptation to the process and slowly integrate more and more buyers and suppliers into using VMI models across the supply chain.

The overall finding shows that current practices rely heavily on manual processes, experience and verbal communication. This limits visibility and efficiency. These conditions are not directly suitable for direct VMI implementation.

However, the qualitative evidence from interviews and observations indicates that staff and supervisors are willing to adapt for improvement, provided that the systems are simple and easy to use. Thus adoption of VMI can be a practical solution to increase efficiency while reducing cost and ensuring more effective supply chain processes.

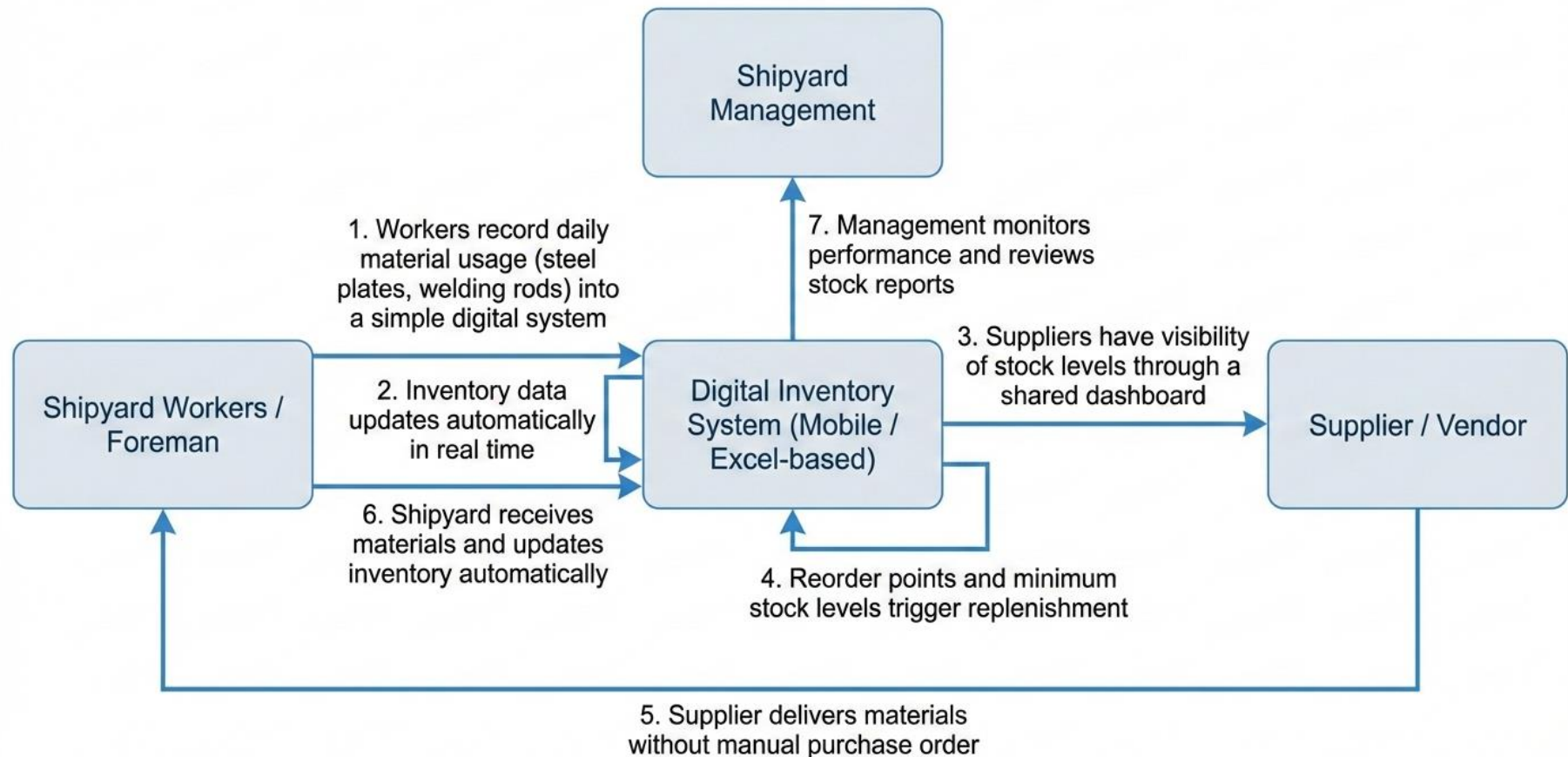
The study finds that VMI in traditional shipbuilding can be adopted when:

- Simple and easy to use tools are adopted
- Systems that are customized to local work culture and skill
- Training and support is provided
- Supplier information sharing is improved

In conclusion, a question-based qualitative analysis demonstrates that Vendor Managed Inventory, supported by basic digital systems, can serve as a practical pathway for modernizing traditional shipbuilding operations in Bangladesh.

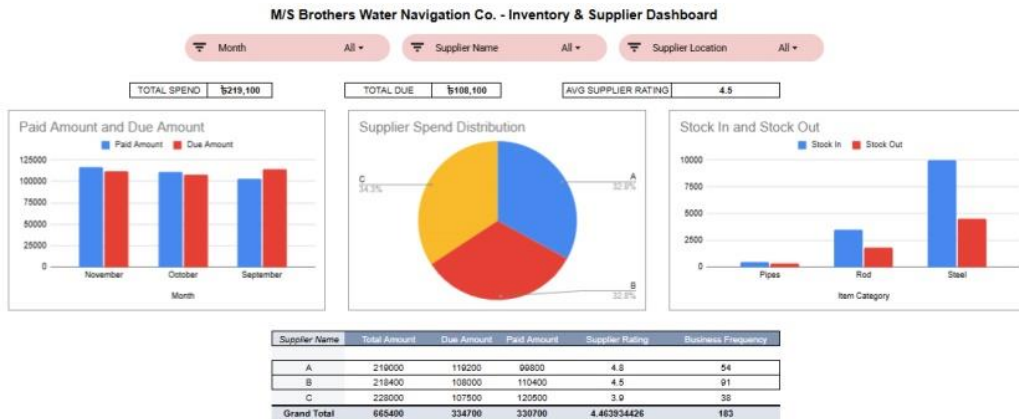
VMI Model

Vendor Managed Inventory (VMI) Process Model for Traditional Shipbuilding

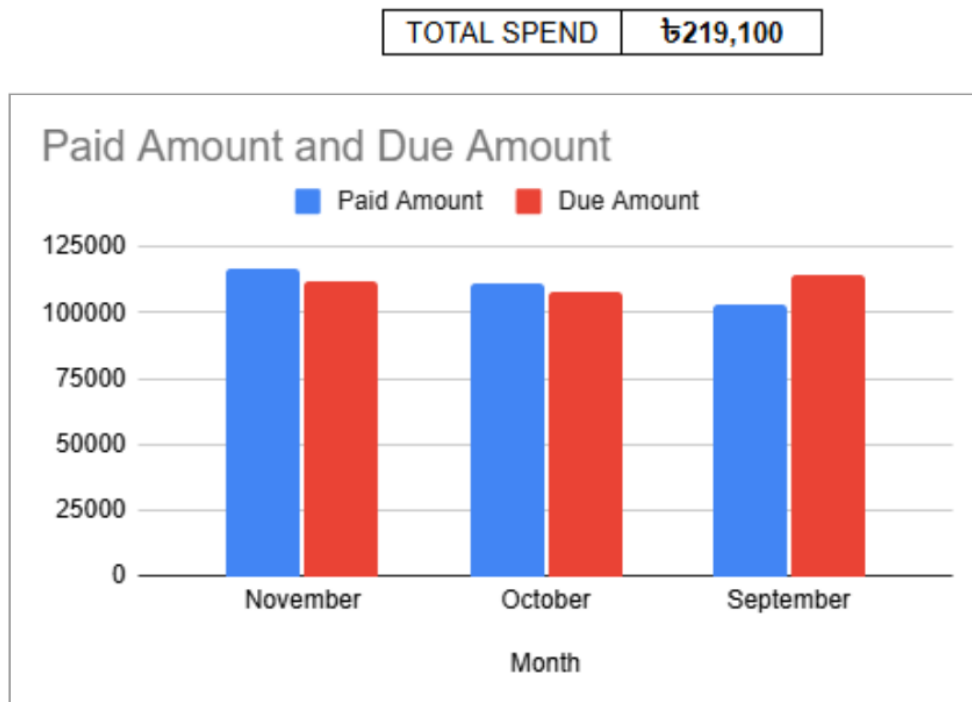


Information Sharing Dashboard

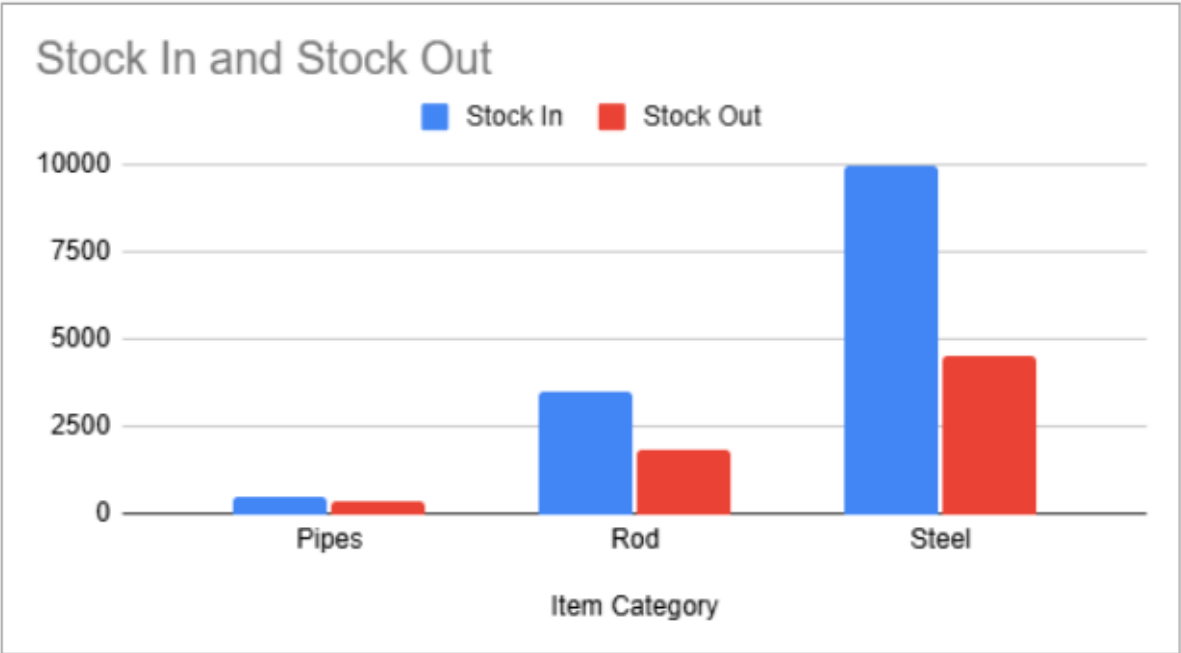
The Dashboard focuses on the key elements that would be needed to track and monitor internally and in the VMI program on a day to day basis. The visualization is broken down into various categories and charts for easy view and monitoring. The dashboard graphs are presented below.



Amount Payable and Amount Paid Tracking Graph



Stock In and Stock Out graph

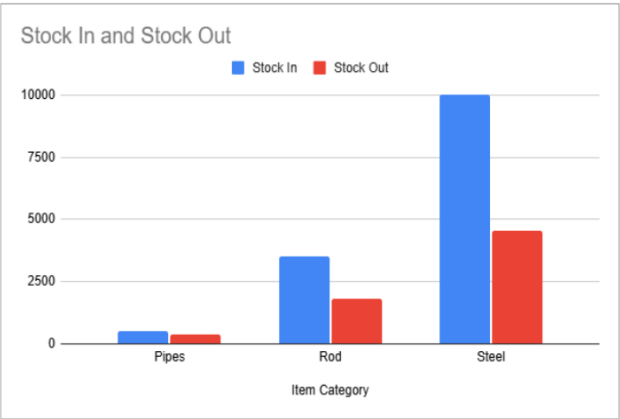


Monthly Data based on Stock, Supplier and Listed Items

Month	Total Amount	Paid Amount	Due Amount
November	229100	116800	112300
October	219100	111000	108100
September	217200	102900	114300
Grand Total	665400	330700	334700

Supplier Name	Total Amount	Due Amount	Paid Amount	Supplier Rating	business Frequency
A	219000	119200	99800	4.8	54
B	218400	108000	110400	4.5	91
C	228000	107500	120500	3.9	38
Grand Total	665400	334700	330700	4.5	183

Item Category	Stock In	Stock Out
Pipes	500	360
Rod	3500	1820
Steel	10000	4560
Grand Total	14000	6740



Supplier Rating and Overview Dashboard

Supplier Name	Total Amount	Due Amount	Paid Amount	Supplier Rating	Business Frequency
A	219000	119200	99800	4.8	54
B	218400	108000	110400	4.5	91
C	228000	107500	120500	3.9	38
Grand Total	665400	334700	330700	4.463934426	183

Chapter 5: Recommendation and Conclusion

5.1 Recommendations

Based on the findings from the interview, observations and literature review, the following recommendations are proposed to support the adoption of Vendor Managed Inventory.

- **Adaptation of Step-by-Step Vendor Management Approach**

Rather than implementing VMI at once, a gradual approach should be taken to initially focus with a few SKUs to start and later as more understanding about the process is built among the workforce and suppliers more materials can be incorporated into the program

Strengthening Supplier Coordination and Information Sharing

Basic agreements need to be established to set service level agreements between parties to ensure quality of service and ensure proper collaboration. Sharing inventory usage and stock-level information through simple digital records will enable suppliers to plan replenishment more effectively and reduce emergency procurement.

- **Customize Systems to Match Worker Skills and Work Culture**

Digital systems should be designed with bilingual interfaces using both English and Bangla, simple data entry requirements, and mobile-based access to make the system more accessible and affordable. The system should support existing workflows instead of forcing major changes to daily routines.

- **Provide Basic Training and Ongoing Support**

Practical training sessions can be conducted to gain the workers' and supervisors' confidence. Continuous support in the early stages of implementation would lower resistance and improve the long-term acceptance of VMI and digital tools.

5.2 Conclusion

Modernization of the shipyard industry in Bangladesh is about to occur. Traditional procurement systems breed inefficiencies; however, VMI could be a viable solution. Integration of computer systems that can be tailored to meet regional needs would make the following possible:

- Reduced procurement workload.
- Improved demand visibility.
- Lower inventory costs.
- Enhanced supplier collaboration.

The qualitative results reveal that there is a good response from both the workforce and management for the implementation of better systems, provided that these systems are kept simple, are what they are familiar with, or meet their current work processes. Digital inventory systems, with a step-by-step VMI approach, can help improve the availability of inventory, minimize delays, and increase the efficiency of operations of the conventional shipyard.

Ultimately, VMI provides a real-world tool that helps fill the gap between the classic process of shipbuilding and more modern approaches to managing the supply chain. VMI can then be utilized with a phased approach that takes into consideration local factors in order to empower the sustainability of the Bangladeshi shipbuilding industries.

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Appendices

Interview Question

1. How is buying materials (procurement) and keeping stock handled in the shipyard right now, based on what workers and staff do every day?
2. What are the operational and technological bottlenecks in the existing processes that limit VMI implementation?
3. How do workers and supervisors perceive the use of digital systems and VMI?
4. What are the customizations suited to their skill levels, work culture and operational needs that can make the adoption of digital systems and VMI easier for them?
5. Do you think that the improved process will make work easier and make work convenient ?
6. What improvements are expected from VMI adoption in regards to inventory management and production efficiency?

Copy of Internship Acceptance Letter



MS BROTHERS WATER NAVIGATION CO

Dawdkandi Municipality, Dawdkandi, Comilla.

To
Sazzadul Haque Jony
14, R.K Mission Road, Motijheel
Dhaka, Bangladesh - 1203
Email - sazzadulhaquejony@gmail.com

Subject: Appointment Letter for Internship as Logistics and Vendor Management Intern

Dear Sazzadul Haque Jony,

We are pleased to inform you that you have been selected for the position of Logistics and Vendor Management Intern at M/S Brothers Water Navigation Co.

During the internship period, you will be primarily responsible for assisting with inventory management, handling customer orders, coordinating with vendors and suppliers, and supporting procurement and logistics operations as assigned by your supervisor.

Your internship will commence on **01/09/2025** and continue until **30/11/2025**, unless extended or terminated earlier by mutual agreement. This internship is intended to provide you with practical experience in the supply chain and shipbuilding operations of our company.

You are expected to maintain confidentiality of company information and adhere to the professional standards and policies of M/S Brothers Water Navigation throughout your internship period.

Please sign and return a copy of this letter as a token of your acceptance of the above terms and conditions.

We welcome you to our team and look forward to your valuable contribution.

Yours sincerely,

Redwan Ahmed Munna
Head of Business
M/S Brothers Water Navigation Co
Cell - 01866785428

M/S Brothers Water Navigation Co
Shagpo, Dawadkandi, Cumilla. Cell - 01866785428
Site Office - Janata Dock Yard, Dakkinpara, Rupganj, Narayanganj, Dhaka Division, Bangladesh.

Internship Report - Sazzadul Haque Jony -V.21.pdf

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