Report on

Ensuring stock availability of raw material in inventory so that production process do not face any disruption at ANWAR GROUP OF INDUSTRIES

By

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A report submitted to the BRAC Institute of Governance & Development in partial fulfilment of the requirements for the degree of Masters in Procurement & Supply Chain Management

BRAC Institute of Governance & Development (BIGD)

BRAC University

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Declaration

It is hereby declared that-

1. This report is an authentic piece of work completed during my Master's degree program at BRAC University.
2. The content of this report doesn't include any material published before or written by any third party, without where proper citation and referencing have been applied to acknowledge the original source accurately.
3. The report does not include any content that has been approved or is currently under consideration for another academic degree or diploma at any university or educational institution.
4. I have appropriately acknowledged all significant sources of assistance and support throughout the completion of this report.

I affirm the honesty and integrity of this work and take responsibility for its originality and adherence to academic standards.

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Supervisor's Name with Signature

Mr. Mahbub Ahmed Chowdhury, FCIPS
Senior Vice President & Head of Procurement
The City Bank Limited

Letter of Transmittal

To,
Mr. Mahbub Ahmed Chowdhury, FCIPS
Senior Vice President & Head of Procurement
The City Bank Ltd.
Subject: Submission of the Report on 'Ensuring stock availability of raw material in inventory so that production process do not face any disruption'.

Dear Sir,

This is my pleasure to display my report on '**Ensuring stock availability of raw material in inventory so that production process do not face any disruption at Anwar Group of Industries.'** Which I was appointed by your direction.

I have made every effort to complete the report with the required information and proposed recommendations in a concise and thorough manner to the best of my ability.

Sincerely yours,

……..

Md. Abdur Rouf
ID: 22282026
BRAC Institute of Governance &
Development, BRAC University
Date: September, 2024

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Executive Summary

Anwar Group of Industries, a pioneer in building materials manufacturing in Bangladesh, has diversified its product offerings to target consumers across various segments of society. This requires solid demand forecasting, as effective forecasting will facilitate better product allocation.

This paper aims to identify an effective process for ensuring raw materials in inventory so that production does not face disruptions, considering factors such as product proliferation, volatility, customer demand, and stockout/overstock situations. A mock simulation and analysis will determine the effectiveness of the suggested approach.

The report addresses several aspects of ensuring raw materials in inventory and preventing production disruptions, highlighting some challenges and best practices. It outlines optimization problems and simulation approaches, emphasizing the importance of forecasting for those in charge of supply chain management. This relates to the notion that "Anwar Group is now in a strong position to allocate products more effectively" due to the availability of more reliable demand data and the absence of inventory issues.

To improve processes, better collaboration with the production department is needed to ensure wider access to production volume data. Additionally, establishing a forecasting department and enhancing the quality control over the availability of historical data may be beneficial. Most importantly, this paper demonstrates that certain systems can be utilized to make the forecasting process as effective as possible when managing inventory allocation in relation to demand and supply chains.

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COMPANY OVERVIEW

ANWAR GROUP of industries is a prominent business conglomerate in various sector like as steel, cement, pvc pipe, corrugated sheet, dying, spinning etc. This group has been established strong market leader in the industry through innovation, better quality and superior focus on meeting customer needs. Anwar Group has kept excellence contribution in nation's growth and development.

Anwar Group focus mainly in quality management. The company adheres ultimate quality control process from sourcing raw materials to each stage of final production. This steady commitment ensures customer satisfaction with highest standards, durability, reliability and safety.

Anwar Group's market leadership is captured by its strategic investment in excellent manufacturing facilities, continuous innovation and strong distribution network that ensures product availability overall the country.

This Group's invest enormous sound technology in research and development for manufacturing to improve product quality, reduce costs, and enhance efficiency.

Customer satisfaction is the base of Anwar Group's philosophy. As a leader in the steel, cement, and PVC pipe industries etc, the groups not only meet but often exceeds industry standards, setting benchmarks that others strive to achieve. By continually investing in its people, processes, and products, Anwar Group is poised to maintain its leadership position while contributing to the nation's economic development.

Chapter – 1: Introduction

Ensuring the availability of raw materials in inventory is crucial for maintaining an uninterrupted production process in any factory. Effective inventory management has a significant impact and provides several key benefits to the production process. The availability of raw materials prevents production halts, facilitates a smooth production process, and helps meet production schedules.

Safety stock maintains customer satisfaction by ensuring timely delivery of finished goods. Consistent availability of materials enables efficient use of resources, as machines and labor are not idling due to material shortages. This increases overall productivity and lowers operational costs. Purchasing raw materials in bulk and keeping adequate stock protects against price fluctuations and saves costs from urgent or last-minute purchases.

Maintaining raw material stock ensures a factory can respond quickly to changes in market demand, avoiding significant delays. There is no alternative to maintaining production consistency and leading the market with quality products. As a result, this approach saves costs and enhances brand reputation.

In summary, ensuring the availability of raw materials significantly impacts a factory's ability to maintain uninterrupted production, optimize costs, and enhance overall operational efficiency. Therefore, effective inventory management is critical to a factory's success.

Chapter 2. Literature review on Ensuring Stock availability for maintaining smooth production process

2.0. Introduction.

Maintaining adequate stock of raw materials is essential for ensuring a smooth production process. Any scarcity in raw materials, for whatever reason, can severely disrupt production, causing potential delays and loss of market leadership. Even if a company manages to recover by replenishing its inventory later, recapturing market position and regaining customer trust may be challenging.

2.0.1. Purpose

The purpose of this study is to explore effective methods for ensuring stock availability in the production process. This will involve discussions with production management, supervisors, stock controllers, and warehouse staff. Issues identified will be analyzed using cause-and-effect diagrams to identify root causes. A common issue found is that incorrect stock quantities or misplaced items often result from last-minute stock movements due to sudden changes in the production plan.

2.0.2. Scope

This study focuses on finding efficient, cost-effective strategies to maintain stock availability throughout the production process. This involves planning from the acquisition of materials, determining how much to dispatch to production, and maintaining adequate stock levels to meet future production needs until the next lot arrives.

2.1. Importance of stock availability

Efficient inventory management is crucial for balancing supply and demand. When businesses overstock, it leads to overproduction and high waste levels. By using historical data to predict trends, manufacturers can schedule production in a way that prevents both excess and shortage.

2.1.1. Minimizing disruptions

Disruptions due to insufficient stock are most common when launching a new product. To avoid this, it's essential to accurately assess the consumption rate of the new product and ensure that enough stock is ordered to meet demand.

2.1.2 Meeting production demand

Meeting production demand requires maintaining sufficient stock levels to ensure a smooth production flow. Any delays due to stock shortages can lead to inefficient processes and the need for unscheduled overtime to meet deadlines, ultimately increasing operational costs. The production of certain products may have to be delayed if the required raw materials are not available. However, any disruptions to the production process will still cause lengthy delays as the missed production will have to be made up at a later date.

2.2. Assessing raw materials requirement

Material Requirement Planning (MRP) is a widely used approach for managing inventory. Problems typically arise due to ineffective MRP systems. Clear production planning is necessary to avoid both surplus and scarcity in inventory. Variations in production levels caused by an increase in customer orders or a new product introduction, for example, are situations where additional raw materials stock must be available. The aim of ensuring stock availability can be most easily achieved with the use of one of the many methods of material requirements planning (MRP). The function of an MRP system is to determine when and how much material is required so that it is possible to fulfill the delivery of a product on time.

2.2.1. Analyzing production needs

Production needs vary due to factors like schedule changes, temperature, humidity, equipment wear, and production methods. The production plan is derived from demand and capacity planning, and assigning work time to operations is called load planning, which impacts inventory and stock availability. Key to stock requirements is determining if the plan is level, chase, or hybrid. A level plan maintains a steady production rate, using inventory to meet demand, while a chase plan produces only as needed. Mixed strategies require responsive scheduling. High variation complicates stock management, and models can be used to simulate changes and assess impact on stock needs.

2.2.2. Determining lead time

Lead time significantly impacts determining the level of safety inventory in Supply Chain Management (SCM). Safety inventory is maintained to buffer against uncertainties in demand and supply during the replenishment period. Longer lead times increase exposure to these uncertainties, leading to higher safety stock requirements. Production forecast and market demand can take a strong rule maintaining lead time so that customer become satisfaction getting their required product by on time.

2.3. Considering seasonal variations

Seasonality has a direct impact on stock levels. In common practice, stock should be maintained according to demand during the off-season, while in peak season, stock levels should be increased based on market demand. Additionally, the price of raw materials may also vary depending on the season, and stock levels should be adjusted accordingly.

2.3.1 Establishing effecting inventory management

Establishing an effective inventory management system allows stock to be continuously available for production without excessive oversupply and incurring high holding costs. The key to successful inventory management is to have a continuous and stable approach towards suppliers and tight process control.

2.3.2. Setting reorder points (ROP)

When the current inventory level meets the ROP, it will be time to order more stock. If the ROP is correct the new stock should arrive just as the last unit of stock has been used, resulting in no stockouts and no overstock. A stockout refers to an event that depletes a stock of inventory to zero. This can be very costly in terms of customer satisfaction and potential sales lost if the item is a finished product. The reorder point could be calculated in the following formula: Reorder Point = (Average Daily Usage x Lead Time in Days) + Safety Stock.

2.4. Implementing forecast technics

Demand and sales forecasting, though still an imperfect science, are essential to all effective inventory management systems. Forecasting has two components - demand forecasting, in which the asset's computer predicts the future demand for an item, and sales forecasting in which the user informs the system of a known future event that is expected to generate a known increase in demand for an item. When a product has a reasonably stable rate of demand and the time periods over which future demand can be predicted are relatively stable, forecasting can add significant value.

2.4.1. Monitoring Stock Levels

Analysis consumption patterns can be used to predict future stock demands based on a systematic analysis of past consumption. Various statistical algorithms and data mining techniques can be applied to find patterns in consumption that can be used to build models for future consumption. This type of system is best used in a repeat type production environment where there is a high chance of obtaining accurate predictions based on stable production and consumption environments. Models can be used to produce schedules for manufacturing and resourcing in line with projected demand. Through inventory tracking systems, accurate stock status information can be made instantly available to relevant personnel. This can provide a vital tool to help management make informed decisions as to the status of stock availability and whether action needs to be taken to increase or decrease stock levels.

2.4.2. Regular Stock Checks

Checking stock regularly is too much vital issue to ensuring stock availability whenever required. This can be done in a variety of ways and can depend on the value of the item to the company. Different kinds of check list can be imposed regularly so that don't skip any crucial information/data in stock management.

2.5. Utilizing inventory tracking system

Two different technologies, portable data terminals (PDT) and radio frequency (RF) equipment, can be used to conduct periodic or cycle counting via an inventory tracking system. A PDT is a handheld computer that has a built-in or attached barcode scanner and can be used in place of regular inventory and stock checks. A firm using PDTs can schedule cycle counts throughout the year so that each item is counted at least once. RF equipment allows warehouse personnel to collect data in real-time, meaning that as soon as an item is scanned, database records are instantly updated. This makes it possible for employees to identify and investigate inventory discrepancies as they arise. Using these two technologies, a firm can eventually achieve real-time inventory accuracy and essentially eliminate the need for large scheduled stock checks at specific points in the year.

Traditional inventory control systems allow for the regular performance of stock checks. However, recent developments in computing and barcoding technology have made it possible to integrate more sophisticated systems. These include continuous automatic or periodic data capture using barcoding, radio frequency identification (RFID), and two-dimensional barcodes.

2.5.1. Effective Inventory control measures

One of the key factors in ensuring stock availability for uninterrupted production process is having effective inventory control. This is because having just enough stock is of no use if the stock is not available when it is needed. This can happen if there is a stock out due to a high inventory turnover rate that companies are experiencing in today's business environment. Management of inventory, which is an idle resource, has a direct impact on maintaining the necessary stock levels throughout the production process because inventory management provides an answer to two important questions: when to order and how much to order.

2.5.2. Regular Inventory Audits

Inventory auditing is a way of checking that the current stock level matches the reported stock level. There are several different methods of audit that can be employed for different materials. The first one is called a cycle count. This involves breaking the inventory down into smaller categories and counting at a regular interval. This is beneficial for raw materials that are fast moving.

2.5.3. Implementing First-In, First-out (FIFO) method

The first-in, first-out (FIFO) method has been a widely used technical tool for a long time. It is very effective in reducing backlogs. During times of rising prices, FIFO results in a lower cost of goods sold and higher profits because older, cheaper inventory is used first. FIFO promotes accurate inventory valuation and efficient stock rotation, benefiting cost control and financial reporting.

2.6. Implementing Material Requirement Planning (MRP)

Implementing Material Requirements Planning (MRP) in inventory management helps businesses plan and control manufacturing processes by ensuring that the right materials are available at the right time. MRP streamlines inventory management, reduces costs, and enhances operational efficiency, leading to a more responsive and cost-effective production process.

2.6.1. Collaboration with Production Department

The production department is an important source of information for material requirements, inventory movement, and control. It follows the routing sequence, prepares the bill of materials, estimates the time required to complete each operation, prepares the operation and process sheets, and helps set production standards. Together, these activities are essential for effective materials planning and control.

2.6.2. Sharing Production Forecasts

The first step in collaborating with the production department is sharing the production forecasts. These forecasts provide long-term projections and specific details of what is planned to be achieved in product manufacturing. The forecast usually includes a time dimension, often in the form of a production schedule, the volume of products to be produced at specific times, and the resources required for production. By sharing the forecasted demand for the near future using a forecasting model, the inventory control department can better estimate future stock requirements.

2.6.3. Coordinating Production Schedules

Both marketing and production schedules must be carefully aligned. For many companies, marketing serves as a tool to influence demand to match production capabilities. However, companies should also consider alternative strategies for adjusting production, such as subcontracting or maintaining idle capacity in anticipation of future demand increases. Continuous reassessment of actual demand against forecasts is essential. If a significant deviation is observed, the causes should be investigated, especially if it results from changes in the market environment due to competitor activity.

2.7. Mitigating Risk Strategies

Diversifying the supplier base is a strategy that organizations should adopt to increase them

chances of securing the necessary resources to maintain production at a reasonable cost, even during supply shortages or price increases. Relying on a single supplier for a critical component often means that production may need to be halted if that part becomes unavailable or is only available at a significantly higher price. Therefore, having a contingency plan is essential—an alternative plan ready to implement if the primary plan fails. This is especially relevant in supply chain risk management, where disruptions are often caused by unforeseen events.

2.7.1. Implementing contingency plans

A key approach to developing a contingency plan is to establish a 'backup' for the primary supply chain. This involves sourcing an alternative supplier for a specific component. When allowing dual sourcing or sourcing interchangeable parts, the organization must clearly specify which supplier is considered the primary source and which is the secondary source.

2.7.2. Monitoring Market trends and Supply Chain Risks

A risk monitoring and management system is one of the key strategies for managing supply chain risks. This system consists of a series of procedures designed to detect potential risks early, monitor the development of recognized risks over time, and minimize their impact. The goal of this strategy is to ensure that actual realized risks do not exceed the threshold of acceptable risks. Risk management involves detecting and predicting potential risks, as well as assessing the possible positive and negative effects caused by these risks.

2.8. Conclusion

The conclusion drawn from the analysis of stock allocation for a typical process industry is that it is critical to ensure the availability of stock at all times for uninterrupted production activities. Building a large inventory of finished goods is not always the right strategy to address stockout situations. Data collection, assignment, and maintenance are key activities for ensuring the right level of stock at the right time.

Chapter-3: What factors happened in our company (ANWAR GROUPS) practically

Introduction: We cannot implement all effective global strategies in our company due to certain limitations. Factors such as national economic policy, natural disasters, unskilled manpower, and corruption act as barriers to adopting better practices. To ensure improved business practices and increased productivity, these barriers need to be identified and addressed. Below are some of the common barriers faced by our company.

3.1. Lack of inventory management skill

Sometimes, a shortage of raw materials causes panic in inventory management due to a lack of proper inventory management skills. The team is not familiar with contingency plans and does not know how to respond effectively in case of disruptions. Due to limited knowledge about smart inventory management, they are unable to maintain the usual production flow during material shortages in the market.

3.2. Unskilled manpower in inventory

In most cases, it is not possible to measure realistic data or information in inventory using tools such as projected sales volume or production volume. The team is often unwilling to update themselves with the latest technology or processes that could help address any issues. As a result, they are unable to prevent production interruptions during a crisis.

3.3. Natural disaster

Sudden floods or other natural disasters impact the collection of raw materials, which, in turn, affects inventory levels. Suppliers are unable to deliver materials within the declared lead time, resulting in raw material shortages in stock.

3.4. Insufficient implement of technology

Old or outdated software is used in inventory tracking systems. Most employees do not feel comfortable using software-based inventory systems, which makes it difficult to organize data and accurately realize forecasts, leading to disruptions in managing raw materials.

3.5. Not proper build up relationship with suppliers

Identifying reliable suppliers is a vital task. Building strong relationships with suppliers can help ensure the availability of raw materials during volatile situations. Proper relationship management and supplier development are essential to maintaining safety inventory and ensuring timely deliveries. We have observed a lack of monitoring in supplier relationships, which sometimes leads to raw material shortages and production interruptions.

3.6. Don’t properly collaborate with Production dept.

The production department is an important source of information for material requirements, inventory movement, and control. The department provides accurate forecasts of the quantities to be produced. However, due to a lack of sincere collaboration, we do not receive accurate forecasts from them, making it difficult to determine the exact quantity of materials needed to maintain stock levels. As a result of this poor collaboration, we are unable to maintain adequate safety stock.

3.7. Having not contingency plan

Contingency is essentially having an alternate plan ready to go if the primary plan fails. This is

especially relevant in supply chain risk management where supply chains are often disrupted by events that were not anticipated. In these cases, the ability to quickly enact an alternate plan may mean the difference between operational success and failure.

3.8. R& D team not existence

R&D team works making growth company's prosperity, quality, brand value etc developing internal barrier. They find out all of lacking and try to remove barriers continuously. But in our company, there are no R&D team, that's why any kind of barriers like as inventory shortage are not find out and production face interruption sometimes.

3.9. Fund availability

The R&D team contributes to the company's growth by enhancing its prosperity, quality, and brand value while addressing internal barriers. They identify shortcomings and work continuously to remove these obstacles. However, in our company, there is no R&D team, which is why barriers such as inventory shortages are not identified, leading to occasional production interruptions.

Chapter -4: What's the gap between literature review and Practical scenario in ANWAR GROUPS; how to minimize this gap

4. Introduction

Strategies for our company's growth should be developed based on our economic, social, educational, and cultural environment. The ultimate outcome will be achieved when the business strategy aligns global standards with local practices. The following steps can be taken to ensure raw material availability and uninterrupted production by aligning global standards with local practices.

4.1. Making skill to manpower

We could not implement world-standard technology in our workplace due to various limitations. Therefore, we need to focus on training our employees to the highest level possible, despite our limited resources. Skilled manpower can deliver the best outcomes. Without trained personnel, it is not possible to prevent disruptions in inventory and production.

4.2. Supplier development and making collaborative relationship

To not only secure safety stock in inventory but also complete projected production volumes,

we should build collaborative relationships with our suppliers. We must support suppliers whenever they face challenges by providing technological assistance, financial support, and employee training. Only well-developed suppliers can supply raw materials while minimizing barriers and preventing disruptions.

4.3. Sourcing ability

Better sourcing skills directly impact inventory management. When we have reliable sourcing information for our required products from multiple suppliers, we can arrange safety stock that meets lead times. Therefore, sourcing is a vital key to inventory management and can help prevent disruptions in production.

4.4. Proper fund management

As we have limited resources and funds, we need to ensure proper utilization of our funds to avoid any difficulties in purchasing raw materials. Unplanned expenditures can lead to inventory shortages; therefore, effective fund management must be implemented to prevent disruptions in production.

4.5. Liaison with internal stakeholder

Strong collaboration among internal stakeholders can create an information bank where everyone can share their difficulties and troubleshoot the problems they face. The manufacturing process is a group effort, so without effective communication with internal stakeholders, it is not possible to prevent disruptions in production.

Chapter -5: Conclusion

As a part of our practical-oriented project in our MPSM program, we have tried to have a clear understanding of the present supply chain process in Bangladesh. After a clear understanding of the present process, we have evaluated the ensuring stock availability of raw material in inventory and disruption process in the supply chain. We have developed a clear understanding of this process with a project in ANWAR GROUP OF INDUSTRIES. We have given a brief of the existing process of the supply chain at ANWAR GROUP OF INDUSTRIES and looked into the ensuring the raw materials in inventory and disruption in production process. We have collected data, analyzed and evaluated the data to get an overall detailed understanding of the forecasting and product allocation process at ANWAR GROUP OF INDUSTRIES. We have looked into the ways through which ANWAR GROUP OF INDUSTRIES can increase their forecast of ensuring raw materials in inventory accuracy. We have identified the factors that affect the forecast accuracy and have made an in-depth study of these factors to get a clear understanding regarding the ensuring raw materials in inventory accuracy. In the ensuring raw materials in inventory and disruption in production process, we have seen the existing process of ensuring raw materials in inventory at ANWAR GROUP OF INDUSTRIES. Then we have tried to compare between standard process and existence process in ANWAR GROUP. Eventually we find out the key point and has been described briefly how to implement practically for ensuring raw materials in inventory and protect disruption in production.