

# Challenges of Warehouse Operations: A Case Study in Retail Supermarket

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## Abstract

The research represents a case study on Bangladesh retail supermarket. The study demonstrates the intricacies of warehouse management practice. It elaborates the dynamics of retail supply chain and the spiral affects how warehouse can play a significant role. In addition to this, the study identifies external factors, market trends, and possible barriers which influence the overall performance of warehouse operation. The paper is based on secondary data that encompassed three major retail chains in Bangladesh. The paper also reveals opportunities to improve warehouse performances in terms of planning, design and operation. The authors demonstrate some recommendations for industry practitioners to achieve a higher level of productivity in warehouse management

**Key Words:** Retail Supermarket, Stock Keeping Units (SKU), Enterprise Resource Planning (ERP), Warehouse Management System, Responsive or Efficient Supply Chain, Purchasing Power Parity, FMCG

## 1. Introduction

The concept of retail supermarket does not even span a decade and the industry has uphill challenges. It causes due to many factors such as political unrest, government legislations, import barriers, purchase power parity (PPP) and skilled resources etc. On top of that, implementation of modern IT infrastructure, Enterprise Resource Planning (ERP) and Warehouse Management System (WMS) etc. were major obstacles. In recent trends with a rapid change of consumer buying preferences, retail supermarket is growing very fast. The sustainability of this industry depends on the performance of its supply chain and a balance between responsive and efficient warehouse operation. To gain a competitive edge, such as fast market penetration, product availability at a right

price and at a right place, warehouse productivity and cost competency have no alternatives. Warehouse operations have a fundamental set of activities in common which are (i) Product receiving, (ii) Put away, (iii) Storage, (iv) Order picking, (v) Packaging, (vi) Sortation & Accumulation and (vii) Unitizing & Shipping [1]. To execute more smaller transactions, handle and store more items, provide more product and service customization, offer more value added services, process more returns, receive and ship more international orders, Less time to process an order, less margin for error, and finally warehouse management system capabilities are the major roles of warehouse management.

## 2. Literature Review

When a consumer walks into a supermarket, it is taken almost granted that right products will be available at a right place. Sometimes they expect premium quality products at par to wet market price, adequate cold chain shall be maintained for fish, chicken, vegetable, and dairy & cheese products to ensure food safety. These days online shopping gets much popularity among dual income household groups to avoid hassle, save time and greater convenience. To support online customer service, a robust logistics infrastructure with advanced IT platform is necessary which is connected with warehouse product availability and quick replenishment. In retail operation, performance measurement parameters are considered in terms of time, cost, reliability, flexibility and speed. And the ultimate player in this logistics game is warehouse efficiency in real time environment. Integrated supply chain encompasses all the activities from suppliers, manufacturers, distributors and retailers [2]. And the interdepartmental functional role involves sourcing of raw materials, conversion of raw materials into final output and distribution of products to end consumers. Supply chain is the process of effectively managing the flow of materials and finished goods from retailers to customers using the manufacturing facilities and warehouse as potential intermediate steps [3].

There are six drivers in SCM. These are (1) Facility, (2) Inventory, (3) Transportation, (4) Information, (5) Sourcing and (6) Pricing [4]. Among these, facility consists of places where inventory is stored, assembled, or fabricated. World class warehouse management should include performance, practice and objective for warehouse operation [5]. The efficiency level of warehouse operation can be measured through productivity, shipping accuracy, inventory accuracy, dock-to-stock time, warehouse order cycle time and storage density.

### 3. Methodology

The research represents based on the secondary data, includes interview with retail industry experts, online database, books, journals, conference papers etc. Widespread research papers and conference papers have been appraised from International Journals such as PROQUEST, EMERALD, EBSCO, IEEE, ACM, JSTOR etc.

### 4. Discussions

#### 4.1 Supermarket Warehousing

In a fast paced competitive environment warehouse requires continuous improvement in design; particularly facilities in layout planning and distribution network design to bring higher efficiency in performance [6]. To incorporate modern concepts such as Just-In-Time (JIT) or lean management brings new challenges to industry experts to rethink on several issues such as reduce inventory level, reduce lead time, minimize response time, and increase higher level of productivity. In less than a decade, the global retail industry has witnessed a significant achievements such as bar coding, Radio Frequency Identification (RFID), Enterprise Resource Planning (ERP) and Warehouse Management System (WMS) etc. Implementation of all these technologies contributes a real time environment of warehouse operation and faster communication with other supply chain partners. Many resources are involved in planning and operating of such warehouse like space, labor, and equipment in order to achieve capacity, throughput and service at a minimum cost. Grocery supermarket warehouse operation is complex. And it operates in an extreme uncertain environment. In terms of stock keeping unit (SKU), on an average a supermarket warehouse carries (8,000-10,000) products. However, for a hypermarket the numbers can be two to three times higher. Currently there are three major supermarket players in Bangladesh (i) Agora, (ii) MeenaBazar and (iii) Shwapno. In general supermarkets carry (8-10) categories of products such as (i) Grocery

(Food and Non Food), (ii) House Hold, (iii) Apparel & Linen, (iv) General Merchandise (including Personal Care), (v) Dairy & Frozen, (vi) Produce (Fish, Meat, and Vegetable), (vii) Stationary & Toys, (viii) Tobacco and others. A huge quantity of imported products enters Bangladesh territory either through land boarder in illegal ways or through luggage parties. In the "produce" category fish, meat, vegetable, and fruit are included. In the sub-categories of "meat" includes beef, chicken and mutton. All these products require a different set of warehousing, processing centers, grading and sorting facilities which are also part of warehouse operation. A cold chain facility in different temperature is a pre-requisite for these products. In the "grocery" category there are two sub-categories, one is food and the other is nonfood. In the food category "Bulk Commodity" is also a sub-sub-category which includes pulse, rice, salt, bulk oil, spices etc. In the "Dairy & Frozen" category includes cheese, butter, frozen food, chocolate, liquid milk in poly pack and tetra pack etc.

#### 4.1.1 Warehouse design

*Warehouse Structure [7]:* To ensure the highest level of operational efficiency, conceptual design and facility layout planning are crucial. Facility layout planning deals with functional issues such as storage capacities in particular departments, technological facilities which are required to deliver an optimal level of service on how orders shall be placed and executed. At this level, throughput requirement is one of the main concerns to serve storage facilities and future operating cost. *Size and Dimension:* Considers the construction cost of a warehouse, inventory holding policy, auto replenishment process and overall material handling procedures. To be specific, idea formulation is required on storage capacity of a warehouse under two circumstances (i) to determine inventory levels externally as the warehouse has no direct control of inbound shipments and (ii) under the circumstances when a warehouse can directly control the inventory policy. The objective of planning and process is to ensure the best system performance by allocating the appropriate space and achieve an optimum level of efficiency.

#### 4.2 External Factors in Warehouse Operations

##### 4.2.1 Handle multiple batch of production, suppliers and origin

Approximately 40% SKU's sold in the grocery category are imported. Same products imported by multiple suppliers with different pack size cause

different purchasing cost and selling price. Renowned companies such as Unilever, Nestle or Reckitt Benckiser etc. operate all across the world and certainly they don't market all products in one particular territory. Due to that, there is a gray market. Products sold in Unilever, India or in Unilever, Dubai are not always available in Unilever, Bangladesh. However, those products are widely available in Bangladesh imported through wholesalers or other intermediaries. As such product tractability is very crucial and individual barcode ensures tractability in terms of multiple batches, product origin or even pack size. These products require careful monitoring while receiving, storage and shelving.

#### **4.2.2 Fake and tampered products**

One of the biggest challenges in retail warehouse operation is to handle fake and tampered products. As previously mentioned, many products are imported through gray channel and due to customer demand retailers need to carry those products. Once a product is imported through Chittagong port, it travels through a lot of itineraries inside the customs authority at Chittagong port terminal. Due to bureaucracy and unethical practice by some of the custom officials, the process of releasing an imported container sometimes gets delayed. In many cases it can take up to two to three months. This delay also affects the shelf lifetime of the goods and once a supplier fails to sell goods in time, sometimes they do unethical practice and tamper the expiry dates and put a fake long expiry date. From outside, the product looks good but once consumed it can cause serious health issues. Identification of a genuine product is most difficult. Therefore, whenever any product is bought from wholesaler, each and every piece is checked with utmost attention and skilled hands.

#### **4.2.3 Comply with government rules and policies**

Though retail supermarket is one of the fastest growing industries, but there is a dual practice in the government policies between retail supermarkets vs. street shops. Retail supermarket owners need to comply so many rules and procedures. However the same product when it is sold in street shops does not require to comply many things. At supermarket the warehouse receiving personnel needs to go through all the papers such as BSTI (Bangladesh Standard Testing Institute) approval papers, BSTI dates, Importers sticker, proper address, body MRP and TP etc. Failure to comply any of these can have severe penalty by the law enforcing authorities to the supermarket owners. In most cases, importers and

wholesalers don't have proper documents while delivering goods. This causes severe hiccups as well as shortage of product availability in the outlet.

#### **4.2.4 Tractability of suppliers cold chain**

Products like dairy & cheese, frozen food, liquid milk, juice and beverage require absolute zero tolerance in cold chain maintenance. The whole process requires from the point of origin to the point of delivery. Any deviation of temperature control within the process gets rejected while receiving. Warehouse receiving team needs compliance of written standard operating procedures. Apart from this, fish, chicken, vegetable and liquid milk receiving and distribution also requires cold chain preparations. Frozen items are kept from (-4 degree C to -20 degree C) temperature. For Chocolate, juice, tetra pack milk and other dairy products require (18 degree C to 20 degree C).

#### **4.2.5 Crosscheck approved sample vs. actual receiving**

Supply relationships between supermarket chains and suppliers in the developing world have an integral chain and a level of economic theory [8]. And products must match all specifications every time with approved sample while receiving the actual products at warehouse. As such different parameters are used for receiving different categories such as (FMCG grocery, imported item, bulk commodity, perishable, cattle etc.) For companies like Unilever, Proctor & Gamble, Nestle, Reckitt Benckiser etc. requires to check body TP (Trade Price) and MRP (Maximum Retail Price) where the PO (Purchase Order) and actual GRN (Goods Receipt Number) copy shows the same. Simultaneously, date of expiry embossed in the body, size and quantity which have previously agreed, while negotiating products with price should match at receiving time. These massive operations require robust automated tracking and visibility. Enterprise Resource Planning (ERP) is widely used for retail operations. Therefore there are many transaction codes (T-code) which are universally practiced either the retail is running through a platform in SAP or JDE etc. On the other side, for vegetables and cattle's, while receiving every lot must match with the parameters benchmarked. In an ideal environment a cattle has three varieties (Local Ox, Indian Origin or Hybrid). When it arrives in the Central Processing Unit (CPU) which is inside the warehouse are inspected through veterinary doctors and QC (Quality Control) personnel. The size of the cattle should be from (80 kg to 100 kg), preferably with (2 to 4) teeth, and a minimum 48 hours of health diagnosis

is mandatory. The Fat level of the cattle depends on the originality (Local Ox, Indian Origin or Hybrid) is also considered.

#### **4.2.6 Grading & Sorting**

Vegetable, cattle and fish are processed in a Central Processing Unit (CPU), a part of central warehouse operations. Potato and onion requires extensive level of sorting and grading before products are sent to outlet. Grading and sorting of potato and onion are done based on the size; shape, free from any scratch, and spot on their skin.

#### **4.2.7 Formalin, Ethylene and Carbide test**

Food safety is one of the major concerns among the Dhaka city dwellers at this moment. Different types of local and imported fruit, vegetable, and fish contains chemicals such as Formalin, Ethylene or even Carbide. These chemicals are put in wrong proportions by the unscrupulous traders to avoid any wastage or shrinkage as well as to artificially increase the shelf life of the products. Therefore, in every stage of the receiving process, comprehensive tests are done with the compliances of the respective certified authorities.

#### **4.2.8 Performance evaluation & benchmark**

Performance evaluation provides a feedback of the warehouse performance on several KPI's (Key Performance Indicators) and GAP analysis [9]. This also talks about more on a proposed design or operational policy and possibilities to improve it. Different approaches are practiced for performance evaluations such as: benchmarking, analytic models, and simulations

### **5. Warehouse Health, Safety and Environment**

One of the most important compliances in warehouse operations is Health, Safety and Environment [10]. The United States Department of Labor states, OSHA (Occupational Safety & Health Administration) The Occupational Safety and Health Act of 1970 (OSH Act) was created to avert employees from serious injury at work or even unnatural death. This law enforces, safe work environment and conducts training and helps employees to know about their rights and responsibilities. In addition to these, employers should also have ethical practice and must have certain compliances. Retail warehouse operation is mostly labor intensive. Therefore, a company must maintain all code of conducts imposed by the international and national bodies such as (ILO) International Labor Standards and others.

### **6. Administrative and Other Factors**

There are many administrative factors which should be handled with high level of efficiency and management skills. These also require extensive knowledge in Industrial Relations such as labor unrest, grievance, working at late hour, productivity of an employee, salary and wages, multitasking ability, theft and pilferage, collective bargaining, ability to meet emergency support with limited resource; a pre-requisite for smooth warehouse operation

### **7. Conclusions**

In summary, this research represents a case study which investigates the current major challenges the supermarket industry face. An extensive interview with industry experts, practitioners, consultants along with international journal review and online database reveal warehouse operational complications that affect lower warehouse performance. The goal of warehouse management is to ensure operational efficiency while focusing on cost reduction. Performance measurement benchmark at warehouse operation comprises of Quality, Speed, Dependability, Flexibility, Reliability and Time linked with few internal as well as external factors. Warehouse design, facility layout and capacity assessment can synchronize the demand and supply gaps and ensures the smooth flow of operation. Simultaneously government should provide a common platform to all retail players irrespective of size and volume. In addition to this, collaborative planning and supplier relationship with retailers can help to fight against uncertainty and risk mitigation. This can also increase chances for supply chain surplus and overall value creation to end consumers. To get the optimum consumer satisfaction, government has to ensure reliability and visibility to all possible supply chain intermediaries and drivers. Last but not least, ethical business practice is a prerequisite for a country as well as a nation to sustain continuous positive growth. Though operational efficiency and good warehouse management practice along with government interventions on few legislative issues; the industry can be greatly benefitted. Therefore, the ultimate beneficiary will be the end consumers on "food safety"; a journey for a convenient shopping experience and a healthy lifestyle.

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