A Case Study of Ghanaian Manufacturing Industry

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Abstract – The manufacturing industry has come to regard logistics to enhance their product or service rather than a place to save costs in recent years. It is also well acknowledged that logistics and supply chain management impact firm performance. Despite the expanding importance of logistics, little work has been done to create a theory of logistics' role in the manufacturing industry, and further research into this area is certainly needed. The first part of the literature review presents an empirical review of the concept of the supply chain and logistics in the Ghanaian context. The section touches in the ideologies of both the inbound and outbound logistics. The literature review provides an assessment from performance measurement before presenting an empirical review of what this paper presents. Following that, this paper reviews earlier studies that have thoroughly analyzed supply networks. The data analysis is reported in the results and discussion sections included in this research. Lastly, we conclude with some recommendations after this section.

Keywords – Outbound Logistics, Inbound Logistics, Supply Chain, Supply Chain Management, Performance Measurement.

I. INTRODUCTION

Most logistics strategy studies have neglected logistics' strategic implications in favor of investigating logistics in isolation. These studies identify three distinct logistics strategies, each requiring a different level of operational integration, i.e., 1) integration in the movement of products within the company; 2) integration in information transfer within the company; and 3) integration with upstream and downstream supply chain partners. Logistics studies may develop by combining ideas from other operational domains. If certain ideas are taken from the subject of strategic management, a better understanding of logistics' role in the firm's overall strategy may be obtained. Authors' resource-based view on logistics are crucial to this goal's foundations for a unified theory of logistics [1]. This advancement in logistics strategy research enables a value-based view on logistics, which includes logistics as a stage and resource-based supportive organization's plan. Once logistics is value-based, it helps not just to boost productivity (through, for example, more efficient operations), but also to support growth (through, for example, the ability to adapt to new business models and raise the value of the physical goods being delivered).

Certain firms are said to compete well with plans that involve considerable logistical content, and these corporations pursue value-based rather than transaction-based logistics [2]. Dell, H&M, and Inditex, the latter of which is most known for its subsidiary Zara, are examples of such firms. Because of its clear methods and consistent delivery dates, Dell is able to maintain its competitiveness in sales and marketing. H&M's approach prioritizes taking advantage of economies of scale. Logistics is critical in this method since it enables for economies of scale to be obtained. While expanding, H&M often picks nearby locations to those where the company is already entrenched. Until the new area achieves economies of scale, it may rely on the neighboring areas' current logistical operations. Inditex, the Spanish clothes retailer, is able to adjust to changes in customer demand faster than its competitors due to a transparent supply chain that allows for quicker delivery times—measured in days rather than months.

Dell, H&M, and Inditex all depend significantly on operations, particularly logistics, to carry out their business strategy. Because of its low stock levels and high degree of transparency in its processes, Dell is able to offer new items, such as a new kind of CPU, relatively quickly, while its rivals must first sell off their previously manufactured PCs holding stock of obsolete CPUs [3]. H&M can compete on price because of the magnitude of its logistics operations, which allows for economies of scale. Inditex uses its logistics capabilities to expand into new global markets. With the advent of the Zara Home idea, the Spanish corporation has extended from its beginnings in the clothes sector into the furniture market, using the same quick response

logistics model that it used in the clothing market. Of course, logistics aren't the only reason these businesses have thrived. However, as seen by their performance, logistics serves as a driver and facilitator of their strategy.

Despite the fact that logistics is important to the success of firms such as Dell, H&M, and Inditex, little is known about the role logistics plays in these companies' strategies [4]. In the idea, there seems to be a tipping point between logistics and strategy. As a consequence, strategic logistics functions have gotten less attention than logistics operations itself. Strategic management, on the other hand, tends to address logistics and operations in a manner that overlooks the particular features of logistics in compared to other forms of operations. Businesses often simplify operations to a set of generic activities that may be performed at any time by any company. Unless this is the case, operations will be seen as being aided by a generic set of resources, and they will be addressed with insufficient attention.

Due to the rapid increment in new competitors throughout the globe, logistics businesses have been able to improve their storage and delivery options. Most businesses have made it clear that they recognize the value of a specialized storage and distribution business, and they run one that offers several benefits. The necessity of establishing operational excellence, which includes offering high-quality service in all aspects of your organization, has grown. As a result, several firms are increasingly outsourcing their international logistics services. These firms began engaging outside specialists to perform jobs that were not critical to their organization. With the assistance of an experienced logistics provider such as DHL global, warehouse and distribution processes may be optimized and supply costs minimized. Businesses may also reduce their inventories while maintaining the agility required to react rapidly to change market requirements. Incoming, operating, and departing processes are all part of the logistical procedures involved in a brewery's supply chain. Warehouse and distribution services are the basis for Republic of Ghana third-party logistics enterprises.

The research is motivated by the need to comprehend how a third-party logistics company manages the increasing demand for their services in Republic of Ghana and throughout the world. The logistics provider reorganizes its warehouse operations and distribution network to better serve both itself and its outsourced customer. Some firms, notably brewers, have proved challenging to handle warehousing and delivery services for third-party logistics companies such as DHL. Problems that develop in a manufacturer's outbound logistics must be studied and remedies implemented. In terms of export logistics, most plants are not operating at full capacity in terms of storage and distribution. They have not done a thorough evaluation of the efficacy of their outward logistics. Scientific research must be conducted in command to comprehend how loading and delivery are achieved, as well as the problems that develop and their remedies. The degree to which industrial businesses may benefit from using third-party logistics for storage and shipment is an important topic to address.

This research contribution examines DHL's logistics management for breweries such as Guinness Breweries. GGB collaborated with DHL in May 2011 to manage its worldwide shipping and logistics requirements. The impact of these activities on the financial outcomes of GGB is critical knowledge to have. The outstanding part of this research is prearranged as follows: Section II presents a detailed review of the relevant literature texts, with major focus on the present empirical review as well as the empirical review of this study. Section III focuses on a review of the data and research methodology employed in this paper. Section IV critically analyses the logistics and supply chain management. Section V presents an analysis of the data results and discusses key aspects of the research. Lastly, Section VI concludes the research and recommended directions for further research.

II. LITERATURE REVIEW

Present Empirical Review

Logistics, outbound and inbound logistics, and performance measurement are all covered in depth in this literature study. Books, websites, magazines, newspapers, and theses from the past are all cited.

Concept of logistics

Its primary goal is to meet the needs of its customers, which it does by facilitating the smooth exchange and storing of possessions, facilities, and connected data among different locations, such as those of individual customers and businesses. Logistics property can be both tangible (food, materials, animals, equipment, fluids) and intangible (time, data, particles, energy). Addition of material flow, material behavior, invention, bundling, stock, transport, wareh4ousing, and, in most cases, safety is typically at the heart of physical matter's logistics. A well-thought-out plan of action can show the challenges of logistics, allow for their analysis and visualization, and lead to better solutions. Reducing resource consumption as much as possible is a common logistical suggestion for both storage and transport. Logistics is the process of managing the inbound, outbound, indoor, outdoor expansion of things, amenities, and connected statistics from their fact of source to their point of ingesting in accordance with client demands.

Concept Inbound of logistics

According to Buffa, "inbound logistics" refers to the process of receiving and overseeing the delivery of raw materials and semi-finished products [5]. The inbound logistics plan will include all the components needed to receive, stock, and deliver products

from your suppliers to the company. To put it simply, inbound logistics is everything that has to be transported to the assembly line in order to guarantee the finished product will be ready for sale.

The intricacies and importance of inbound logistics vary widely from one internal operation to the next, depending on factors like the specifics of incoming shipments and external conditions that may impact the efficiency of outbound processes [6]. Certain aspects of incoming logistics need special attention during implementation if logistics success is to be guaranteed for the operation. If your industry requires raw materials for the production of certain goods, you will want to make sure you have a steady supply on hand to keep production on schedule. Every business needs to work and tailor the inbound logistics to meet and satisfy the needs of their customers through the use of warehouses and other internal operations to ensure the timely delivery of their orders if they want to increase efficiency and profitability.

In order to achieve the organization's overarching logistics goal, it is essential that all inbound logistics activities, including receiving packages from suppliers, transporting them to the manufacturing facility, receiving them by verifying with requirement, and delivering the shipment to the spot where require to convert to output, be optimized. In addition, partnering with a Third-Party Logistics (3PL) provider is crucial to improving the incoming logistics process [7]. Shipments in and out of the firm may be optimized, improved, and sped up with the aid of these partners because of the extensive knowledge they have garnered from working in a variety of settings.

Concept of Out Bound logistics

Demand-side issues in the supply-demand relationship are the primary focus of outbound logistics. The procedure includes warehousing and transporting products to the final consumer. Warehouse and storage management/Order processing, packaging/inventory management, transportation, delivery, and delivery-related customer support are all part of the process as illustrated in **Fig. 1**.

Fig 1. Outbound Logistics Activities

Outbound logistics is the shipment or transportation of raw resources, semi-finished items, and complete goods to the ultimate customer or client required, as well as the route that takes the output to their destination [8]. However, some organizations utilize third-party logistics providers to manage incoming and outgoing shipments on their behalf, expediting the process of delivering raw materials to the plant and completed items to consumers. Businesses prioritize the movement of their products from raw materials to completed items and subsequently to distribution centers or retail locations as a critical competency or to stay competitive.

Lerner Outbound logistics is essential for a company to create the whole link between the supplier and the client. Outbound logistics has been defined as "the movement and storage of finished items required by users from the producing area to the end user's location." Data analysis has shown a correlation between a company's financial performance and its logistical skills. For example, using a profit model method, many researchers demonstrated the influence of logistics on organizational efficiency and financial success. Furthermore, many authors used a survey to support this theory that logistics planning has a substantial effect on organizational competency and competitiveness in the sector.

Performance Measurement

The basic goal of logistics is to ensure that all shipment operations go smoothly. Authors in [9] concurs that encouraging innovation and continually upgrading operational processes would increase a country's competitiveness. Measuring performance is critical for continuous improvement, therefore logistics efficiency has come to the top of the list of concerns. The LP posed considerable challenges, making it impossible to assess logistics performance; the solution came in the form of a model of performance indicators produced by the Netherlands Association for Logistics Management, which was effectively employed by a number of enterprises. Logistics has a significant impact on organizational effectiveness.

The findings in [10] revealed that the effectiveness of logistics operations has an impact on the organization's overall performance. Multiple studies support top managers' comments that they attribute improved customer service, inventory levels, and cost to better logistics, indicating that this is a fair generalization. Performance metrics are very beneficial for logistics managers and are required for the management team to make educated choices. Managers in the logistics business acknowledge the importance of performance evaluation as a method of gaining a long-term competitive advantage. Numerous studies in a variety of fields, including those devoted to logistics performance measurement, provide strong empirical support for the practice of performance evaluation, and studies also show that effective logistics performance evaluation is positively correlated with improved organizational performance.

Logistics Performance Assessment

A functional viewpoint is the primary need for assessing the overall performance of a logistics system. From one business to the next, the emphasis has shifted toward establishing more efficient techniques for supporting greater end-users. Several academics have advocated dividing logistics performance assessments into five main areas throughout many years, employing cutting-edge research management: (1) cost; (2) client service; (3) excellence; (4) efficiency; and (5) asset administration. Logistics, as focal point, is accountable for the whole company's quality, timeliness, cost, value, and productivity in terms of economic performance. Logistics includes a scorecard to assess the proposed best approach for operating on top form, since this has a positive influence on organizational productivity. This is because the greatest operations help you succeed, survive, and profit in the market. Most businesses use a variety of metrics to gauge how they compare to the competition, including financial performance across all departments, including logistics; productivity across all departments, including logistics; quality across all departments, including logistics; and cycle time across all departments, including logistics.

Empirical Review for this Study

In this case study, we will be focusing on GGB, a company that operates out of three different locations. These include the Achimota site in Accra and the Kaasi and Ahinsan sites in Kumasi. Outbound logistics at all three locations are the primary focus of this research. In each of Ghana's 10 regions, you may find a GGB distribution center. Brewery warehouses are used to distribute finished goods to numerous strategic places. Due to its present partnership with DHL as third-party Logistics Corporation to handle its superficial logistics operations, GGB remained a suitable candidate for this study's primary purpose. As a management technique, a growing number of manufacturers are hiring external logistics providers to oversee their logistics operations and are also using supply chain performance assessment to boost productivity. Since GGB has contracted DHL as an external logistics provider, it is wise to evaluate the firm's performance in this area. Because of their essential roles in GGB's outbound logistics operations with DHL, bosses, associate managers, and personnel from the construction, logistics, backing, and obtaining departments make up the target audience. These groups were selected because they were assumed to have the necessary background information on the logistical performance tasks that formed the basis of the study.

III. DATA AND METHODOLOGY

Managers, supervisors, and employees from GGB's production, logistics, finance, and purchasing divisions were polled for this study. Both convenience and purposive selection methods were used to pick the sample population, with the only criterion being that participants be managers, assistant managers, or junior staff members of the organization, with department heads also being included. Primary materials were GGB reports, journals, books, and the internet; secondary sources included interviews, surveys, and the internet. Data was gathered mostly via questionnaires and interviews that were designed with the stated goals in mind. Primary data was collected via surveys, in-person observations, and interviews with GGB department heads and the company's

third-party logistics supplier. A self-administered questionnaire was used to compile the data. When GGB hired a third-party logistics service, this compiled data on how well that service performed in terms of outbound logistics. Both closed and open questions were included in the survey's design.

The next section evaluates GGB's outbound logistics and offers suggestions for improvement. Outbound logistics at GGB were evaluated using a five-point likert scale, with responses ranging from "worse than previous," "worse than previous," "same as previous," "better than previous," and "much better than previous." All measurement components of stock chain presentation were implemented from the Supply Chain Operations Reference (SCOR) Model (see **Fig. 2**). After piloting and refining the survey instrument, they were sent to collect the information. All GGB sites had data collected on them. Ten full days were devoted to collecting the cross-sectional data.

Stakeholders in an organization's supply chain may utilize the SCOR as a communication and decision-making tool to address and enhance the quality of the company's supply chain. In order to meet a customer's needs, the model lays out the steps a company must take. Additionally, it offers a foundation for enhancing processes all throughout the supply chain by better explaining them. With input from 70 of the world's most successful manufacturers, the SCOR framework was created by the Supply Chain Board.

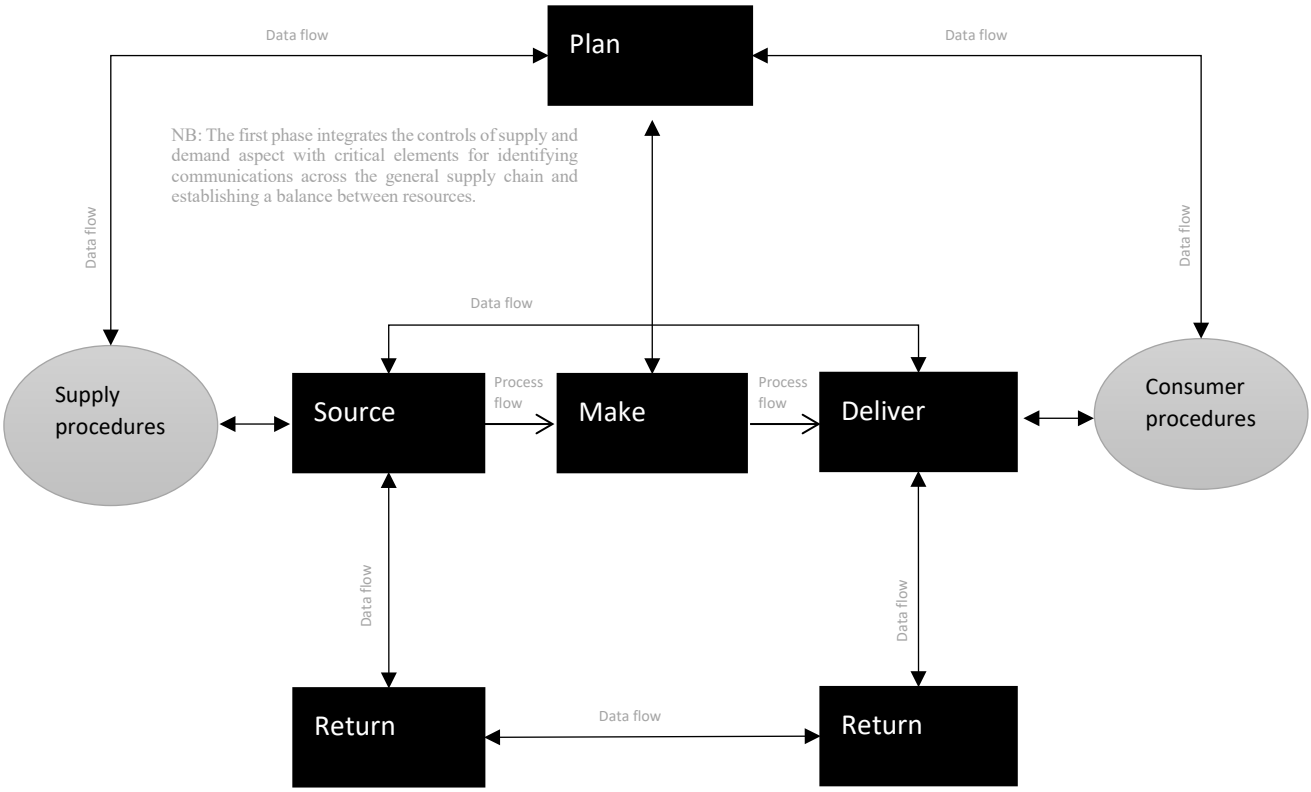

Fig 2. Process and data flow illustrating the SCOR

The "most promising approach for supply chain strategic decision making". Aspects of process re-engineering, standardization, and evaluation are included into the model as well. This model focuses on the five stages (planning, sourcing, manufacturing, transporting, and collecting) that make up the supply chain (see **Fig. 3**). All throughout the supply chain, these same locations keep cropping up. According to many supply chain experts, "the supplier's supplier and the customer's customer" are all included in this process. The SCOR technique may support a firm to examine its stock chain at various levels of procedure aspect. It allows industries to measure the adulthood of their stock chains. The technique imparts businesses to know the five phases of collaboration that occur frequently amongst their stock chain, their group, and their clients. Stock chains involve of unified processes, each of which is essential to the overall success of the process. Companies who use the SCOR framework to identify issues in their stock chains have had optimistic results. Capital savings can be completely leveraged using this method, a stock cable road map can be industrialised, corporate processes can be streamlined, and returns on investment may be anywhere from 2-6 times what was initially invested.

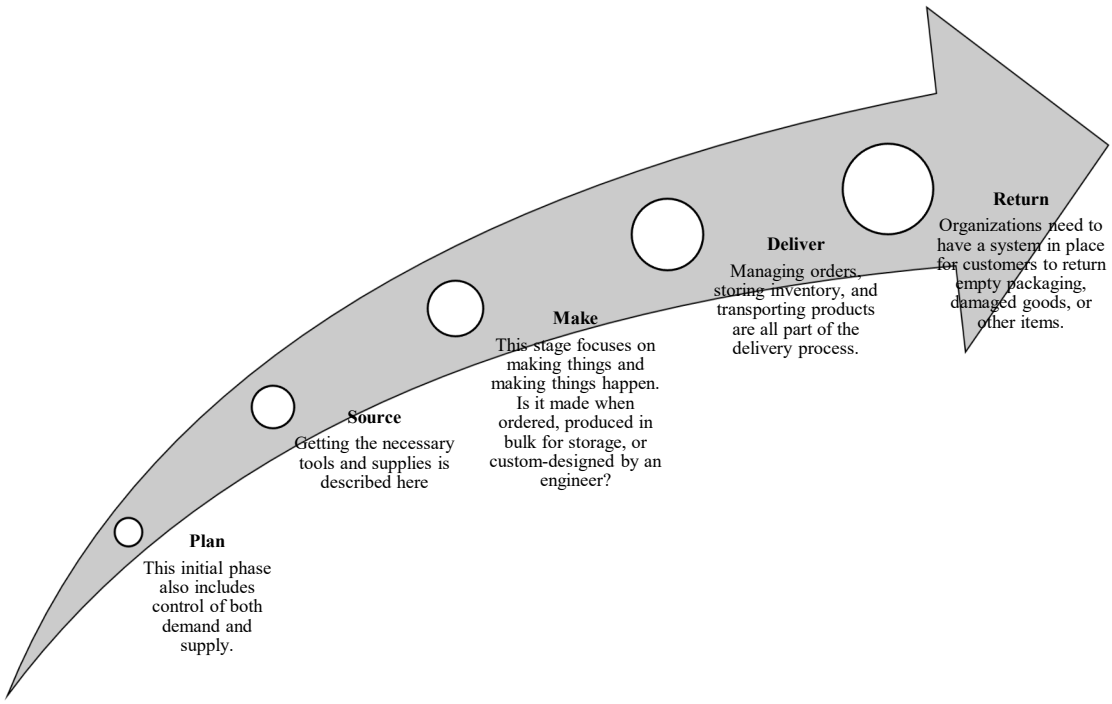

Fig 3. SCOR's five stages

IV. LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Overview of Logistics and Supply Chain Management

"Logistics is a supply process component that organizes, executes, and controls the efficient, effective transportation and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet the demands of customers" [11]. Despite substantial research, there is no universally accepted definition of LM. In the literature, Logistics Management (LM) is often used interchangeably with Supply Chain Management (SCM), with many authors characterizing LM as logistics that extends beyond organizational borders. "Supply Chain Management is a set of methodologies used to effectively integrate distributors, manufacturers, fulfillment centers, and stores, so that products are manufactured and distributed at the correct amounts, to the correct places, and at the right time to minimize system level costs while fulfilling service level requirements."

Schoenherr in [12] proposed the following definitions in addition to these. They insisted on "The full process of commodities and products moving into, within, and out of a firm is referred to as logistics. The supply chain function is mentioned to as "The term "inbound logistics" refers to coordination of arrival and distribution of products from suppliers. The material management system of a corporation organizes the movement of raw materials, completed items, and components across the organization. Physical distribution is the process of transporting completed goods from the producer to the ultimate user. Finally, SCM is a larger concept than logistics since it includes not only the movement of commodities but also the interactions between channel intermediaries ranging from raw-materials producers to end-users. However, there is a growing understanding that SCM involves more than merely logistics management. Delivery Chain Management (DCM), according to Zhang and Qin [13], is the activity of coordinating the actions of several organizations to guarantee a continuous supply of products and services to clients. Logistics management is a significant component of SCM, along with customer relationship management and new product development and marketing.

The idea of SCM gained popularity after its debut in the early 1980s. The Council of SCM Specialists outlines stock chain managing as the strategic control of the whole logistical process, from product creation through final delivery. According to Matthew and Othman [14], stock chain managing is a key element of viable plans aimed at increasing organizational efficiency and profitability. Dealers, mediators, third-party facility breadwinners, and clients are examples of channel partners. Supply chain management encompasses a wide range of internal corporate procedures. The SCM process includes transportation (both arriving and leaving), storage (both temporary and permanent), and stock management. Activities like as obtaining, obtaining, and stock managing are likewise part of the stock chain. Furthermore, prediction, manufacture scheduling and preparation, command dispensation, and client service are all portion of the process. It also includes the data infrastructure essential to keep

track of what's going on. The supply chain comprises everything involved in obtaining a product from its genesis as raw materials to the hands of the customer.

Brewery supply chains usually start with the sourcing, procurement, and reception of raw materials into warehouses from suppliers. The components are then transported to the brew house to be employed in the brewing process. Following the completion of the brewing process, the final commodities are carried to a packing facility where they are readied for shipping to the various storage facilities. DHL serves as a third-party logistics provider, delivering and distributing completed products to a large number of key distributors under its control. The supply chain tasks include order processing, purchasing management, information systems, creation planning and arrangement, client service managing, excellence managing, upkeep managing, inventory management, and inventory control (using ERP as SAP & Granary managing systems). The whole stock chain, from raw resources to ended product and delivery to key suppliers, may be controlled effectively using SAP. Logistics management comprises managing the procedures involved in a supply chain.

Inward and outbound transport managing, swift running, warehousing, material management, order contentment, logistics net design, inventory managing, supply/request planning, and management of third-party logistics facility providers are all included in logistics management but are not exclusively so. Client service, obtaining and buying, production planning and preparation, packaging, and assembly are all included in logistics in varying degrees. Strategic, operational, and tactical planning and execution all include the incorporation of logistics management. It is a method of coordination that ensures all logistical tasks are finished simultaneously. It connects logistics to other fields including finance and information technology, as well as sales and marketing. The industrial and service sectors are covered by this definition's description of material and service flows.

Outward logistics, which includes bodily delivery, are our primary concern. In command to safeguard the effectiveness of the delivery of complete belongings to customers, physical distribution management is an effort to methodically manage a set of interrelated activities such as transport, delivery, warehousing, ended goods, list heights, wrapping, and resources treatment. Bodily delivery administration's goal is to accomplish the flow of ended goods in a way that satisfies consumer demands while requiring the least amount of financial outlay. Collaboration across a variety of tasks, including order processing, purchasing, production planning, material control, and storage, is required for physical distribution management. To provide clients with the degree of service they desire at a cost they can afford, all of these factors must be integrated.

Transportation

Commodities are moved by transportation from point of manufacture to the idea of ingesting. When items are moved across continents or over long distances, their value rises. The term "place utility" is occasionally used to describe this value. Transportation, which determines the dependability and speed of product delivery from one location to another, can affect time value. A transportation network may be imagined as a collection of arrows and ties, claim Shen and Gong [15] Movement is carried out by connections and begins and terminates at nodes. For the majority of forms of transportation around the world, ports, highways, canals, and airports are all examples of key infrastructure. Investment is required for infrastructure expansion and upkeep, which must be supported.

The most important aspect of logistics is transportation because it affects both the client experience and the bottom line. Transportation is defined broadly, or in the context of a specific industry, as the transfer of goods or commodities from one place to another. It is important to distinguish between internal and external transportation inside an organization. Internal transportation might take place within a warehouse between various sections or within a factory during various production stages. On the other side, external transport describes shipments that are made between external entities, like the facilities or warehouses of a business. Cargo, conveyance, and the act of transferring it are the three components of external transport.

Warehousing

Storage facilities are an essential feature of any logistics network. Worldwide, there are roughly a million warehouse facilities, including high-tech, workwise achieved granaries, commercial storerooms, garages, self-storage amenities, and even garden sheds. When it comes to offering excellent customer service while keeping overhead costs to a minimum, warehouses are important. The warehouse acts as a vital connection between the manufacturer and the end user. As time has passed, warehousing has gone from being a relatively small aspect of a company's logistics system to becoming one of the most vital activities involved in the process

Warehouses hold objects (raw materials, components, things-in-progress, and ended commodities) at and amongst the location of source and the site of feasting, and offer status data to managing. Without storing anything, a granary, for instance, might be used to reroute items to other ways in the system. Storage facilities catering to these needs have been developed in a number of different ways. A warehouse's primary purpose is to facilitate the flow of goods and data. Supplying warehouses in strategic areas with varying inventory levels depending on local demand helps ensure a smooth flow of goods from manufacturer to consumer.

A warehouse is a central node in a supply chain where commodities are held temporarily or redirected to another distribution point. There is a fundamental difference between storage facilities used for supplies, those used for processing orders, and those used for distributing finished goods. However, hybrids are acceptable as well. Raw resources, supplementary supplies, and other resources required in manufacturing, as well as semi-finished and final products, are often stored in supply warehouses, which are an integral element of the production process. Goods are temporarily stored in a transshipment warehouse before being transferred to another mode of transport. Logistics firms and stores often share the responsibility of running them. Using cross-docking, manufacturers deliver items to retailers' warehouses that have been specifically selected for that retailer. Here, goods from diverse manufacturers are batched together before being distributed to the appropriate retail shop. This eliminates the requirement for the retailer's main warehouse to do separate picks of products destined for each of its stores.

In the distribution center, the make-up of the product stream is shifted. Depending on the geographic region it serves, a distribution center may be characterized as central, regional, or local. Distribution centers are also known as central warehouses, whereas their decentralized counterparts in smaller regions are termed supply or delivery centers. Goods from several vendors are consolidated in supply warehouses before being sent to different manufacturing and retail facilities. Products are held in delivery warehouses before being sent out to clients. Thousands of items of varying shapes and sizes might be housed in the same facility. Storage space is expensive, so it makes sense to organize it in a way that makes it easy to find what you need fast. The only way to run a warehouse profitably and efficiently is like this. There are two main strategies to arrange storage space: allocating space in advance and allocating space on an as-needed basis.

Logistics Outsourcing

Many firms understood in the 1980s that they required outside assistance to attain their objectives and remain competitive. As a consequence, they began to contemplate employing outside specialists to perform jobs that were unimportant to their company. When a corporation contracts with another company to undertake an in-house activity because the external firm is better capable of supplying the desired service effectively and efficiently, this is referred to as outsourcing. The process of delegating to an outside entity responsibility that are not fundamental to the running of a corporation is referred to as "outsourcing." It is often done by at least two persons. Both the client company that outsources logistics and the service provider that actually performs them. One typical reason for outsourcing is to conserve money and concentrate on the company's core capabilities by depending on a third party to supply some or all of the required labor, capital, technology, and resources.

Outsourcing has been a successful sector with growing levels of attention and investment since primary 1990s. It frequently requires the use of public or contractual transportation providers, as well as third-party warehousing. Businesses that choose for outsourcing might engage the most qualified 3PLs (third-party logistics providers) to manage their processes. The profit of outsourcing becomes obvious when organizations critically analyze their internal structure and resources.

Outsourcing allows organizations to be more agile in the acquisition of rapidly emerging new technologies. By reducing the requirement for in-house infrastructure, logistics outsourcing allows organizations to save money and reduce financial risks. Because of the extent of the initial investment needed, logistics assets like as warehouses and computer networks are costly and risky risks. Corporations are more willing to develop long-term alliances with their suppliers, customers, and other service providers.

Outbound Logistics Opportunities and Challenges: Case Study of GGB

Authors in [16] claim that distributors may use cutting-edge technology to solve even the most difficult logistical problems. Daily operations become less efficient as industrial districts increase as a result of consolidation and distribution networks fill up with an increasing amount of goods. There are numerous issues that have arisen in various domains. The majority of distributor businesses are largely unaware of how to use knowledge to give their auctions and delivery systems a modest edge. Fourth, delivery routes are getting longer, increasing drive time and reducing driver capacity. First, many businesses struggle to load all of their vans on time each day. Second, finding motorists eager to switch creation and contract with clients is becoming progressively difficult. To accommodate the growing distances between their warehouses and consumers, a number of distributors have built new routes.

Breweries could gain insight from the successes and failures of other nourishment and brew straight store distribution productions that have now practiced geographic growth, SKU explosions, and consolidation and have believed out how to efficiently deliver goods to retail across vast lands while maintaining high service and product quality. The standard Monday through Friday auctions and distribution schedule is being phased out in service of more accommodating schedules that could enhance customer service, save down on distribution expenses, and boost logistics effectiveness overall. Utilizing merchandisers to achieve stocks and write guidelines in large batches (even on Sundays to increase Monday delivery volumes) are two recent advances. Another is the extension of "next day/24-hour" order cycles to encompass anything from "same day" to "next scheduled delivery day."

Distributors must reflect implementing route-management knowledge carefully in command to regulate the dependability of contacts between drivers and retailers, decrease inefficiencies in the route distribution system, and guarantee that sales reps adhere to efficient customer-service plans. Consolidation allows each distribution center in the network to extend its reach. Breweries may save money on logistics by consolidating stock in fewer warehouses by minimizing 1.) inventory investment, 2.) stock-outs, and 3.) freshness quality problems. Two, reducing the amount of time delivery drivers spend "long-haul." As a result, a driver may spend more time on the road and make more deliveries. Cross-docking pro-picked side bay tons from a central granary and distributing "double-bottom" side-bay previews to motorists allows for more deliveries with the same number of vehicles.

The Key Indicators of Efficient Warehousing Management

In order to assess the efficacy and efficiency of a warehouse, operational metrics are required. It is necessary to employ quantitative indicators of capacity utilization and movement processes throughout this procedure. All warehouse expenses, such as rent, utilities, and salaries, must be accounted for. Warehouse work may be broken down into two categories: (1) time-bridging procedures that occur while products are being stored, and (2) storage-related movement processes. To gauge efficiency and effectiveness, they must be represented by a set of essential indicators. Capacity, available storage spaces, and stock turnover are the resultant efficiency metrics. Performance indicators of warehouse expenses, broken down into personnel and operational costs, are a good fit for these inputs.

Supply Chain Operations Reference (SCOR) Model

With partner corporations' performance needs in mind, the Supply Cable Assembly recognized the Supply Chain Operations Reference (SCOR) framework. The SCOR model was created to outline the many facets of a company's operations that go into meeting a customer's needs. Each of the five main organization processes Plan, Source, Make, Deliver, and Arrival provides the framework for the model's many components. There are many standards for evaluating: 1) Dependability 2) Adaptability/reactivity Expenses (3) and assets (4). Successfully describing and providing a platform for supply chain optimization for both global and site-specific projects, the model has shown its worth. The SCOR model, on the other hand, was built with factories in mind. When applied to outward logistics services like storage and shipping, the model has a long way to go before it can accurately assess how well the supply chain is functioning. The measuring of logistics performance is also an area that has not been studied. This paper focuses on this topic by detailing the findings of an investigation on the sector-wide impacts of outbound logistics.

V. RESULTS AND DISCUSSION

It was found that GGB's outbound logistics is superior than those of earlier projects. This reveals that, in compared to DHL, GGB does not deliver the ideal order fulfillment experience. The analysis indicated that GGB has maintained its service efficiency in terms of entire order delivery. In addition, an outer logistics operation had no influence on service efficiency as evaluated by delivery performance to customer commit dates. The majority of respondents who were questioned claimed that delivery under ideal conditions was the same as it had been before the implementation. Although some consumers have complained about damaged items, others have remarked an improvement in the quality of delivery. It was determined that the paperwork accuracy rate from GGB to DHL is more trustworthy than in prior operations. Therefore, it is safe to conclude that GGB's outbound collaboration with DHL is defined by a remarkable degree of service effectiveness reliability. Yet, establishing solid lines of communication is essential for improving the quality, efficiency, and dependability of their operations.

The data reveal that GGB's deployment of responsive facility efficiency in relations of delivery completion sequence time occasioned in the similar outbound logistics as earlier. When comparing the loading truck cycle time at GGB with the response time of the service, both are equivalent. When given the same question about responsive service efficacy in determining product cycle time, they offered the same response. Once again, service efficiency did not prove useful in terms of cutting down on order management charges, as most respondents claimed that their experience with GGB and DHL had deteriorated over the course of prior operations. It was also explored whether or not GGB's outbound logistics operations with DHL would be more efficient by minimizing the cost of order delivery.

The data reveal that, in compared to earlier practices, cutting the cost of handling orders has negative implications. The price of delivering orders was decreased in the same manner it has done in the past. In a similar line, GGB has been successful in decreasing the expenses of its infrastructure and labor force. Most respondents felt that the warehouse cost reduction was substantially worse than their past operations. However, there are those who say it's an improvement over what came before. As can be observed from the study, outbound logistics operations cost the same as in past contracts despite the drop in logistics management charges. The transportation cost reduction promise was kept.

Cash to cash cycle time improvement was found to be consistent with prior agreements with DHL. This indicates that there has been little change in the cash-to-cash series time in GGB's outbound logistics through DHL, and that efforts may be taken to

improve performance. The research showed that there had been no significant change in the efficiency with which resources were being put to use. The analysis also found that GGB's efforts to cut down on costs related to its infrastructure and personnel were consistent with those of similar projects. Development on remaining strength revenues did not alteration as stated by most of the accused. It is apparent that there has not stayed any big increase on net advantage revenues. Inquiry regarding upgrading on record days of stock for ended goods exposed that outbound logistics operations have either been the similar or has remained healthier than prior processes. With respect to development on extra record, the defendants answered that it was moreover similar as or inferior than the prior condition.

Lastly, asset measurement working competence of important suppliers of GGB to DHL in footings of development on faulty record remained mainly the same as the earlier as designated by a substantial percentage of the defendants. Customer feedback indicates that third-party logistics providers are continuing to provide the same level of service as in past projects. This demonstrates that GGB has work to do in optimizing its relationships with third-party logistics providers in order to boost customer satisfaction. In addition, there was a split in view on overall satisfaction with third party logistics businesses, with some respondents claiming it is about the same as in the past and others claiming it has increased. This highlights the importance of GGB in promoting a healthy partnership between DHL and other 3PLs.

Assessment and evaluation methodologies that demonstrate opportunities to improve an organization's performance are required to assess not just outbound logistics performance but also additional types of presentation in stock chain operations. The goal of this study was to figure out how a third-party logistics business might best help an industrial producer with outbound logistics. We examine how a third-party logistics provider may help a manufacturer save money and establish if the approach is backed by proof of cost reductions. Our analysis concludes with a series of recommendations on how the industrial sector should go about choosing a third-party logistics provider. A self-administered questionnaire was used to collect data.

Research was conducted using data from SCOR model. Because majority respondents said that GGB's relationship with DHL had worsened, service efficiency did not seem to be particularly beneficial in terms of reducing order management expenditures. It was also looked at whether GGB's outbound logistics operations with DHL may become more effective in terms of responsive service by lowering the cost of order delivery. The findings exposed that it was much less successful than earlier techniques. It also revealed that cash-to-cash sequence period improvement said to be equivalent to earlier DHL transactions. This displays the cash-to-cash cycle time in GGB's outbound logistics with DHL has altered little, and that measures to increase performance may be made.

When questioned about their level of satisfaction, the majority of respondents claimed their experiences working with third-party logistics providers were comparable to previous engagements. This illustrates that GGB still has a lot of work to do to improve the efficacy of its collaboration with third-party logistics providers for the benefit of all parties. According to the results, GGB's outbound logistics are clearly better to those of their previous contracts. This reveals that GGB's DHL link does not provide the best order fulfillment experience. According to this research, GGB's service efficiency in terms of entire order delivery is comparable with previous operations. We were able to develop and validate the factors necessary to the SCOR model's assessment of GGB's employment of DHL as its third-party logistics supplier for its outbound logistics operations using this study.

VI. CONCLUSION AND RECOMMENDATION

The results in this research contribution will serve as a starting point and benchmark against which any manufacturing organization may assess its export logistics operations and, ultimately, the efficacy of its stock chain. The paper reveals a number of challenges encountered by the third-party logistics provider, which have an impact on GGB's outward logistics activities. Among these challenges are the following: 1) Occasional issues with forklift accessibility for outbound logistics procedures, affecting truck loading and resulting in production downtimes. 2) There were clear issues with worker competency owing to their unfamiliarity with GGB processes and work standards. 3) Outbound logistics operations have sporadic vehicle availability issues, which reduces turnaround times. 4) It is been tough to obtain adequate warehouse space during sluggish periods, and it is been much more difficult to keep products outside. 5) Traceability challenges made it difficult to detect and correct quality faults. The third-party logistics provider also cited theft as a concern, and 6) Management at GGB must be aware of these factors in order to display and amount the presentation of stock chain processes, which will advance the corporation's presentation and success irrespective of whether third-party logistics breadwinners accept the test to advance outbound logistics presentation.

The performance measurement methodology developed in the research may be used by GGB management in their continual endeavor towards display analyze and improve efficacy of business’s stock chain. If the third-party logistics provider is serious about increasing loading and storage efficiency, it must address the shortage of available forklifts. Third-party logistics suppliers must have enough replacement parts on hand to repair any forklifts that break down. Furthermore, forklift technicians should be on call at all times to solve any issues that arise. To avoid needless wait periods, there should be a plenty of forklifts accessible. There were also concerns regarding the competency of the third-party logistics provider's workers, which should be addressed. All workers need structured protocols for onboarding and training. To achieve this alignment, you must first learn about GGB's

procedures and methodologies. In order to increase productivity, the third-party logistics provider may recruit talented personnel who were previously employed by GGB but were laid off. Truck turnaround time, as evaluated by responsiveness, has been impacted by intermittent difficulties with vehicle availability and delays, which must be investigated. A robust strategy is required to manage vehicle maintenance and upgrades. Furthermore, there must be enough trucks to avoid holdups. During the lean season, finding adequate storage space or moving things from the warehouse to an outside area has always been problematic.

Since there is already enough of land and space at the Ahinsan brewery site, GGB must build more warehouses there. When there were problems with the product's quality, it was difficult to pinpoint the source. This is due to the increasing chain length in the SAP system. When discussing batches, GGB must ensure that the shipping note is always included. The GGB quality assurance team must train the work of the third-party logistics benefactor on the fundamentals of product tracking and tracing. Theft prevention was also critical to the effectiveness of the outbound logistics strategy. This is usual procedure when commodities are loaded into trucks and delivered to big wholesalers. To deter theft, every loading docks should have visible CCTV cameras installed. Supervisors must be on high alert to ensure effective truck loading. It will be simpler to monitor automobiles if they all have Vehicle Telematrics Systems (VTS).

Data Availability

No data were used to support this study.

Conflicts of Interest

The author(s) declare(s) that they have no conflicts of interest

References

[1]. J. Mentzer, S. Min and L. Michelle Bobbitt, "Toward a unified theory of logistics", International Journal of Physical Distribution & Logistics Management, vol. 34, no. 8, pp. 606-627, 2004. Doi : 10.1108/09600030410557758.

[2]. J. Wei and G. Ou, "Logistics Organization Mode Boundary Definition on the Basis of Transaction Cost Theory", Contemporary Logistics, pp. 8-12, 2011. Doi : 10.5503/j.cl.2011.02.002.

[3]. Diva-portal.org, 2022. [Online]. Doi : http://www.diva-portal.org/smash/get/diva2:230949/FULLTEXT01.pdf. [Accessed: 23- Sep- 2022].

[4]. M. Kamariotou, F. Kitsios and M. Madas, "E-Business Strategy for Logistics Companies: Achieving Success through Information Systems Planning", Logistics, vol. 5, no. 4, p. 73, 2021. Doi : 10.3390/logistics5040073.

[5]. F. Buffa, "Inbound Logistics: Analysing Inbound Consolidation Opportunities", International Journal of Physical Distribution & Materials Management, vol. 16, no. 4, pp. 3-32, 1986. Doi : 10.1108/eb014635.

[6]. G. Svensson, "The Impact of Outsourcing on Inbound Logistics Flows", The International Journal of Logistics Management, vol. 12, no. 1, pp. 21-35, 2001. Doi : 10.1108/09574090110806208.

[7]. E. Anderson, T. Coltman, T. Devinney And B. Keating, "What Drives The Choice Of A Third-Party Logistics Provider?", Journal of Supply Chain Management, vol. 47, no. 2, pp. 97-115, 2011. Doi : 10.1111/j.1745-493x.2011.03223.x.

[8]. F. Bernardi de Souza and S. Pires, "Theory of constraints contributions to outbound logistics", Management Research Review, vol. 33, no. 7, pp. 683-700, 2010. Doi : 10.1108/01409171011055780.

[9]. "McDonald's in Dubai: Operational processes andperformance", Webology, 2021. Doi : 10.29121/web/v18i2/40.

[10]. A. Graeml and J. Peinado, "Measuring Logistics Performance: the Effectiveness of Mmog/Le as Perceived by Suppliers in the Automotive Industry", Journal of Operations and Supply Chain Management, vol. 4, no. 1, p. 1, 2011. Doi : 10.12660/joscmv4n1p1-12.

[11]. E. Demiralay and T. Paksoy, "Strategy development for supplier selection process with smart and sustainable criteria in fuzzy environment", Cleaner Logistics and Supply Chain, vol. 5, p. 100076, 2022. Doi : 10.1016/j.clscn.2022.100076.

[12]. T. Schoenherr, "LOGISTICS AND SUPPLY CHAIN MANAGEMENT APPLICATIONS WITHIN A GLOBAL CONTEXT: AN OVERVIEW", Journal of Business Logistics, vol. 30, no. 2, pp. 1-25, 2009. Doi : 10.1002/j.2158-1592.2009.tb00109.x.

[13]. M. Zhang and J. Qin, "Coordinate the Express Delivery Supply Chain with Option Contracts", International Journal of Information Systems and Supply Chain Management, vol. 9, no. 4, pp. 1-21, 2016. Doi : 10.4018/ijisscm.2016100101.

[14]. J. Matthew and N. Othman, "Supply Chain Management (SCM) Utilisation Based on SCM Drivers in Manufacturing Industry", Jurnal Pengurusan, vol. 50, pp. 123-132, 2017. Doi : 10.17576/pengurusan-2017-50-11.

[15]. C. Shen and H. Gong, "Personal ties, group ties and latent ties: connecting network size to diversity and trust in the mobile social network WeChat", Asian Journal of Communication, vol. 29, no. 1, pp. 18-34, 2018. Doi : 10.1080/01292986.2018.1504976.

[16]. S. N.I, "The Expansions of Vehicle Routing Problems: A Logistical Overview", *International Journal of Psychosocial Rehabilitation*, vol. 24, no. 02, pp. 395