Chapter 1: LITERATURE REVIEW

1.1. Logistics Concepts

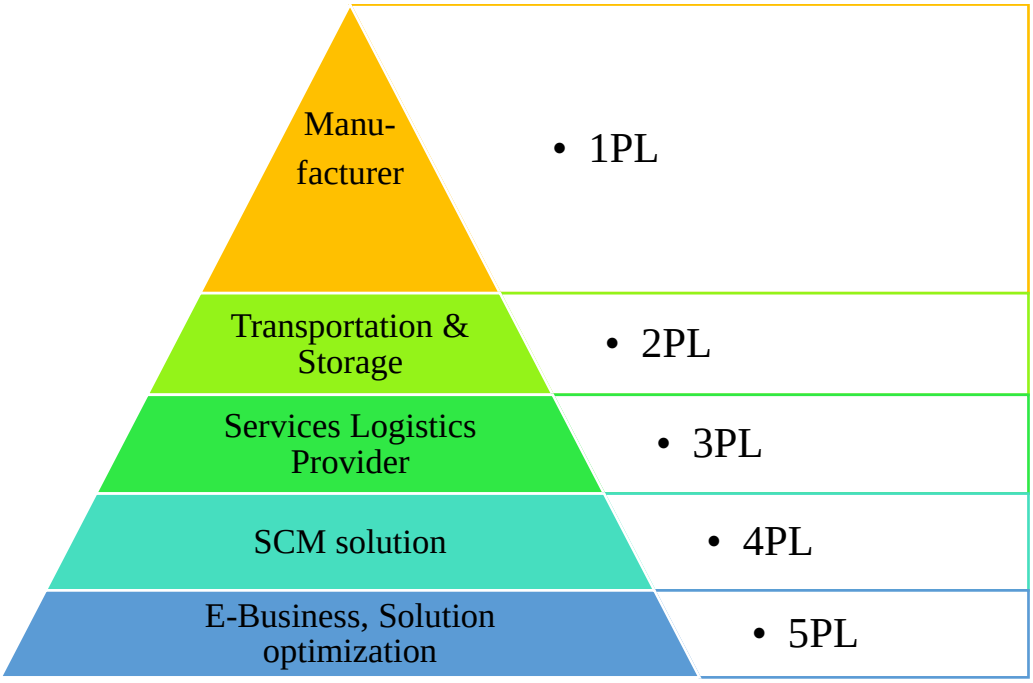


Figure 1.1. Logistics Models

1PL to 5PL is a notion that describes the type of logistics outsourcing, the more numbers before the letters PL, the greater the amount of outsourcing. Party logistics is referred to by the acronym PL, which is also a classification system for logistics service providers. The following is a description of the many PL kinds and their benefits:

First Party Logistics, or 1PL, refers to a person or business that warehouses and delivers its own products to the final consumer. The majority of 1PL applications are found in small production firms that distribute locally.

Second Party Logistics, or 2PL: Businesses that provide 2PL services are categorized as logistics operators since they handle both the transportation and storage of products.

Third Party logistics, or 3PL, is the term for a business that offers logistical support to other businesses. A variety of services, such as distribution, warehousing, and shipping, are provided by 3PL companies.

Fourth Party Logistics, or 4PL, is an independent business that manages a customer's supply chain by combining its own organization's resources and

technology with those of other businesses, like 3PLs, to provide the best possible outcome.

A logistics service provider that plans, coordinates, and executes logistics solutions on behalf of other business organizations is known as a 5PL, or fifth party logistics provider. The 5PL operator bargains prices with other service providers and manages a client's whole network of supply chains.

1.2. Concepts and Roles of Warehouse Management

1.2.1. Warehouse Management

Craft stores transformed into factories throughout the Industrial Revolution. Consequently, manufacturing and mass production facilities were finished, from receipt to shipping. In turn, mass production gave rise to novel storage concepts. Originally, when mass production started, most products were made based on sales projections. Typically, the manufacturing warehouse holds the finished items and raw materials needed to satisfy the prediction. However, businesses relocated warehouses closer to their intended market locations as distribution patterns started to take shape. Customer service standards rose with the usage of both public and private warehouses, both in the marketplace and near the plant (Tompkins, 1998).

Warehouse management refers to the process of executing, monitoring, and optimizing warehouse operations. It involves overseeing all activities in a business's warehouse, including inventory reception and storage, order fulfillment, and shipping, with the goal of ensuring efficient and effective monitoring of a company's goods and products (Richards, 2014)

Warehouse management in 3PL refers to the administration of warehouses run and controlled by outside logistics companies. Managing the inbound receiving of items, inventory control, outbound order fulfillment, and shipping are all included in 3PL warehouse management. Now, additionally, 3PL warehouse management is also responsible for reverse logistics. In order to accomplish this, third-party logistics service providers require a warehouse management system (WMS) that has all the features and capabilities required to guarantee the seamless and effective operation of warehouse management procedures.

A warehouse management system (WMS) is a set of policies and processes intended to organize the work of a warehouse or distribution center, ensuring that such a facility can operate efficiently and meet its objectives. WMS software is designed to optimize operational processes in a warehouse, providing full visibility into real-time inventory levels and storage, staff productivity, demand forecasting, and order fulfillment workflows within a warehouse.

1.2.2. Roles of Warehouse Management

A Warehouse building has functions are:

1. Receiving the good from a source
2. Storing the goods until they are required
3. Picking the goods when they are required
4. Shipping the goods to the appropriate user

(Tompkins, 1998)

Warehouse plays a major role within supply chains and will continue to do so for the foreseeable future, although these warehouses will appear in different guises (Richards, 2018). A warehouse is a component of a logistics system in which materials, semi-finished products, and finished products are rotated from the beginning to the conclusion of the supply chain while providing information about the status, store condition, and location of commodities stored.

Due to the widespread practices of downsizing and/or rightsizing that are currently occurring in many businesses, these organizations are looking for alternate ways to deliver the services that they were previously providing internally. Third parties have grown as a result of this and the growing competition to offer services that are focused on the needs of the consumer. Particularly in warehousing, there is a shortage of labor and growing expenses associated with modern IT. The third-party warehousing sector is expanding because of these problems (Thomas L.Freese, 1998).

Indeed, 3PL (Third-Party Logistics) warehouse management plays a crucial role, particularly for companies, SMEs, and MSMEs (Micro, Small, and Medium Enterprises) that face budget constraints when it comes to investing in their own warehousing facilities.

The growth of technology nowadays is the profound contributor into the modernization of warehouse operations. Technology has advanced quickly, and as a result, new opportunities to boost effectiveness and efficiency in the warehouse are constantly being developed. For warehouse and logistics managers worldwide, this can present a significant challenge along with rising customer expectations and internal pressures to cut costs while enhancing service levels.

1.2.3. Warehousing Operation

1.2.3.1. Warehousing Operation

Products are rearranged and repackaged at a warehouse. Larger-scale packaging is usually used for product arrival and smaller-scale packaging for product leaving. Put differently, this warehouse plays a crucial role in breaking down and redistributing enormous pieces of merchandise in lesser amounts (John J. Bartholdi III & Steven T. Hackman, 2014).

Despite the fact that warehouses can be used for a variety of purposes, most follow the same fundamental material flow pattern. In essence, they accept large shipments, stage them for speedy retrieval, and then, in response to requests from consumers, recover and sort SKUs before sending them to their destinations (John J. Bartholdi III & Steven T. Hackman, 2014).

The physical processes are used to reorganize the product including Receiving, Put-away, Order-picking, Checking/Packaging, and Shipping (John J. Bartholdi III & Steven T. Hackman, 2014).

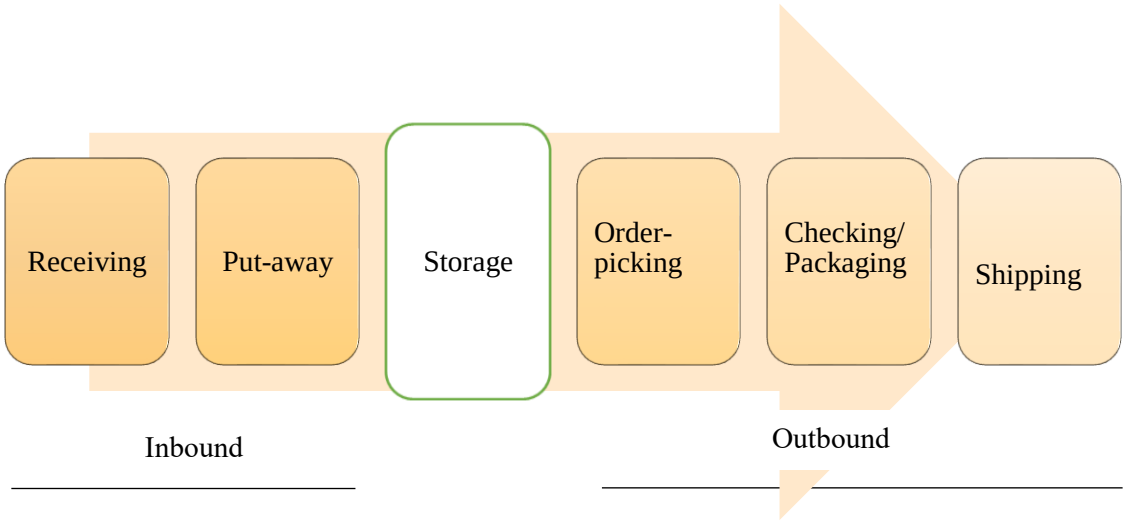


Figure 1.2. An overview of the warehouse operations

Receiving refers to starting with informed in advance when the products will arrive. After delivery, the goods are unloaded and may be prepared for put-away. (John J. Bartholdi III & Steven T. Hackman, 2014). One of the most important aspects of overseeing a warehouse is making sure the proper goods have been received in the right amount and condition at the right time (Richards, 2018).

Put-away: The right place for storage must be chosen before the product may be placed. It is important to scan the storage location once the goods are put away in order to keep track of their placement. After that, this data will be utilized to create effective pick lists that will direct order pickers to locate the merchandise for clients (John J. Bartholdi III & Steven T. Hackman, 2014).

Order-picking: After receiving an order from a client, the warehouse needs to make certain checks, such as making sure the inventory is ready for shipping. Pick lists are then required from the warehouse to direct order picking. Lastly, it has to arrange for order picking and delivery and provide any shipping documents that are required (John J. Bartholdi III & Steven T. Hackman, 2014). Additionally, one costly and labor-intensive part of a warehouse and distribution center is ordering picking (Michael ten Hompel & Thorsten Schmidt, 2007).

Checking/Packaging orders that involve handling each item in a customer's purchase might be labor-intensive. There isn't as much movement, though. This is an ideal moment to confirm that the customer's order is accurate and comprehensive. For most firms, order accuracy is a competitive advantage and an essential indicator of customer service. Not only can inaccurate orders cause inconvenience to consumers by interfering with their business operations, but they also lead to returns, which may be expensive to process (up to 10 times the cost of shipping) (John J. Bartholdi III & Steven T. Hackman, 2014).

Shipping involves organizing and supervising the delivery of products from the warehouse to the client's location, which includes figuring out the fastest and most economical shipping options and keeping track of the shipment's advancement all along the way (Richards, 2014).

1.2.3.2. Reverse Logistics

There are various references from books and reports that provide definitions of reverse logistics. For instance, in a 2002 report called "Reverse Logistics - a framework" by Dennis W. Krumwiede and Chwen Sheu, reverse logistics is described as "the efficient and cost-effective management of the flow of raw materials, in-process inventory, finished goods, and associated information from the point of consumption back to the point of origin, with the aim of recapturing value or ensuring proper disposal.

Another reference is a chapter on reverse logistics in the book "APICS Dictionary" published in 2008 by John H. Blackstone Jr. which defines reverse logistics as "a comprehensive supply chain process specifically designed for the reverse flow of products and materials, encompassing activities such as returns, repairs, remanufacturing, and recycling."

1.2.4. Warehousing's cost structure

The typical cost of managing a warehouse varies from 1 to 5 percent of the cost of items sold, depending on the kind of business and the commodities' worth. Additionally, 20–30% of a business's overall logistics expenses are attributed to warehousing, with an additional 20–25% coming from inventory carrying costs (Richards, 2018).

The type of costs typically associated with a warehouse operation are shown below (Richards, 2018).

Table 1.1. Type of costs in warehouse

Types of costs	Details
Space costs:	- Rent/leasing costs on building/land and building depreciation (depending on how the building and land has been acquired). - Insurance. - Rates or local government taxes. - Utility and telecoms costs. - Fixtures and fittings depreciation. - Racking depreciation.

	- Refrigeration plant depreciation (if applicable). - Repairs and maintenance. - Cleaning, security, and other building equipment depreciation. - Waste disposal.
Direct labour costs (fixed): warehouse operators:	- Wages including on-costs. - Personnel insurance. - Safety wear (PPE). - Welfare; training.
Indirect labour costs (fixed): warehouse management including supervisors and administrators:	- Wages including on-costs. - Insurance. - Safety wear (PPE); - Welfare. - Training.
Labour costs (variable):	- Overtime, bonuses, agency labour.
Equipment costs (fixed):	- Depreciation/lease costs/rental costs.
Equipment costs (variable):	- Running costs, eg fuel, tires, lubricants, batteries. - Packaging, pallets, stretch wrap.
Overhead costs (management, finance, human resources, IT, and administration):	- Salaries and on-costs plus benefits in kind such as mobile phones, accommodation, etc. - Company cars and running costs. - Office equipment and furniture depreciation/lease/rental costs. - Information technology costs (hardware and software).
Overhead costs (sales and marketing in 3PLs):	- Salaries and on-costs plus benefits in kind such as mobile phones, accommodation, etc. - Company cars and running costs.

	- Marketing spends, eg advertising, exhibitions, brochures, etc.
Miscellaneous costs:	- Communication costs; postage. - Bank charges and interest payments. - Funding costs/cost of finance. - Insurance. - Legal and professional fees. - Audit fees.

Moreover, each main activity in the warehouse takes into account a percentage of the cost. It underlines the importance of the pick, pack, and dispatch operation (Richards, 2018).

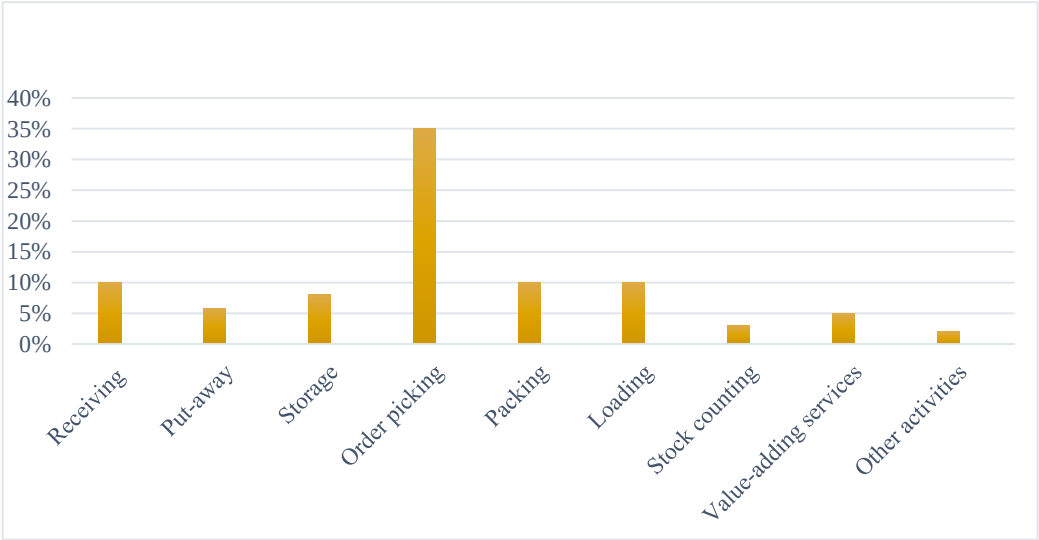


Figure 1.3. Warehouse activities as a percentage of total cost

1.3. Inventory

1.3.1. Inventory Management

Due to its high capital requirements and impact on the delivery of goods to clients, inventory management is one of the most significant operations management activities. All aspects of a corporation are impacted by inventory management, but operations, marketing, accounting, and finance are the areas most affected (Schroeder, 2007).

In other words, inventory management refers to the process of efficiently overseeing and controlling the flow of goods, materials, and products within a

business. It involves managing the acquisition, storage, and utilization of inventory to meet customer demand while minimizing costs and maximizing profitability. Effective inventory management ensures that the right quantity of inventory is available at the right time, in the right place, and in the right condition.

In a 3PL (third-party logistics) warehouse, inventory management refers to the effective administration and supervision of inventory on behalf of customers that contract out their distribution and storage needs to a third-party logistics company. The 3PL warehouse serves as a central location for organizing, distributing, and keeping material for several customers.

1.3.2. Purpose of Inventories

To protect against uncertainties: There are uncertainties in lead time, demand, and supply in inventory systems. Safety stocks are maintained in inventory to protect against those uncertainties (Schroeder, 2007).

To allow economic production and purchase: The cost of producing materials in bulk is frequently low. A comparable circumstance applies to the acquisition of raw materials. Large purchases can occasionally be more cost-effective due to ordering fees, quantity discounts, and shipping expenses, even when the portion of the lot is then kept in stock for future use (Schroeder, 2007).

Moreover, the purpose of inventory management in 3PL warehouses is to ensure that the right products are available at the right time and place to meet customer demands. Rising inventory levels are a response to supply chain uncertainties and changes in consumer spending, and finding a 3PL partner that can manage inventory effectively is crucial for multi-channel distribution and reducing the need to account for inventory surprises in stock volumes. Additionally, real-time inventory tracking, demand planning, and advanced inventory management systems play a critical role in optimizing inventory efficiency and ensuring accurate inventory control.

1.3.3. Types of Inventories

Types of Inventories are basically defined by three categories (Muller, 2011):

Raw materials: Used to produce finished or partially completed goods.

Work-in-process (WIP): The inventory of items that are not yet finished commodities but are in different phases of manufacturing and are partially completed. In a production system, it stands for the items that are being worked on or going through manufacturing procedures currently. WIP ought to be maintained to a minimum. Work delays, long transition periods between processes, and bottlenecks in the queue are some of the reasons why WIP happens.

Finshed-goods: This product is ready for sale to customers currently. Additionally, it can be utilized as a bridge between manufacturing and either predictable or unpredictable market demand. To put it another way, a manufacturing business can create the toys available throughout the year to ensure yearly sales growth throughout the Christmas season.

1.3.4. Dependent versus Independent Demand

1.3.4.1. Dependent Demand

Dependent-demand is not set by the market on its own; rather, it is correlated with the demand for higher-level parts. The demand for the individual parts and assemblies that make up a product is based on the demand for the finished good. On the other hand, raw-materials and work-in-process (WIP) inventories used in manufacturing companies to support the manufacturing activities itself are examples of dependent-demand inventories (Schroeder, 2007). In this environment, the right items in the right quantities at the time are required to complete a finished product (Muller, 2011).

For instance, the need for wheels, motors, brake systems, and other elements during the car-making process is contingent upon the demand for the completed vehicle. The demand for the related parts and components rises in tandem with the demand for automobiles.

Diverse demand patterns necessitate distinct approaches to inventory management. There is a requirements philosophy applied to dependent-demand objects. The quantity of stock ordered is determined by the specifications for products at a higher-level. Extra raw material or work-in-process inventory is not ordered when one starts to run low. Only when additional material is needed for other end or higher-level items is more material ordered (Schroeder, 2007).

1.3.4.2. Independent Demand

Independent-demand is determined by market condition beyond the control of your company's operations, it is unaffected by operational factors. The demand for a finished-good or item that is not influenced by the demand for any other related products (Schroeder, 2007). Independent demand is driven by customer preferences, market trends, and other external factors that are beyond the control of the organization. Managing independent demand effectively involves forecasting and planning to ensure that the right quantity of the product is available to meet customer demand. The appropriate item in an appropriate quantity is necessary in this environment (Muller, 2011).

The independent-demand involves the following category of inventories (Schroeder, 2007):

- Finished-goods inventories and spare parts in manufacturing companies.
- Maintenance, repair, and operating supplies (MRO) inventories.
- Retail and wholesale finished-goods.
- Service-industry (e.g., hopitals, school, etc.) inventory.

For independent-demand, a replenishment philosophy is used. As the stock is used, it is replenished to have materials on hand for customers. Therefore, when the items in the stock start to run out, an intake amount is triggered for more material, and the inventory is replenished (Schroeder, 2007).

Chapter 2: OVERVIEW OF THE COMPANY

2.1. DKSH Vietnam Co., Ltd Profile

DKSH Vietnam Co., Ltd is a fully foreign-invested enterprise that provides sales, marketing, and logistics services in Vietnam.

The company was originally established in 1890 when it began business activities in Saigon and Haiphong. For the next 60 years, it was active in importing consumer and pharmaceutical products and also representing shipping lines and insurance companies. DKSH re-entered Vietnam in 1991 and obtained an operating license for Diethelm Vietnam Co., Ltd. in 1999.

In 2002, the Company established its presence on a 12,200 m2 site located at 23 Independence Avenue within the Vietnam Industrial Park - Singapore. The initial phase of the logistics center had a storage capacity of 3,500 pallets (Duc, 2020).

Continuing its expansion, in 2004, the company opened another inventory facility for consumer goods in Hanoi. By the end of the same year, the second phase of the logistics center was completed, increasing the storage capacity to 4,500 pallets.

In 2005, a significant milestone was achieved with the inauguration of the Diethelm Logistics Centre in Binh Duong Province. Located approximately 30km from Ho Chi Minh City, this state-of-the-art facility covered an area of 12,200 sqm within the Viet Nam-Singapore Industrial Park in Thuan An District. Equipped with advanced technology, it boasted a storage capacity of 8,000 pallets and served as a distribution hub for over 20,000 retail outlets across the country.

The year 2008 witnessed the inauguration of the DKSH Vietnam logistics center within the Vietnam-Singapore Industrial Park. This facility was specifically designed to meet international standards for the pharmaceutical industry, providing a substantial storage capacity of 22,000 pallets for the entire country.

In 2009, a significant change occurred as the company changed its name from Diethelm Vietnam Co., Ltd. to DKSH Vietnam Co., Ltd. This rebranding initiative aimed to foster a unified and globally recognized DKSH brand across 36 markets.

Operational areas include the marketing and transportation of nutritional supplements, as well as the provision of warehouse services, pharmaceuticals, chemicals, and veterinary products. They also provide packaging and labeling services for goods.

Furthermore, the company has obtained various certifications, including ISO 2004 certification issued by UKAS-SGS. They also hold Good Storage Practice (GSP) certification for vaccines and biological products, Good Manufacturing Practice (GMP) - WHO certification for packaging activities, and ISO 13485 certification for testing equipment and devices specific to healthcare. In addition, the company has a state-of-the-art information technology system, which is specialized and standardized on a global level using the SPA platform, making it one of the leading systems in Asia (Duc, 2020).

2.2. Organization Structure of DKSH Vietnam Co., Ltd

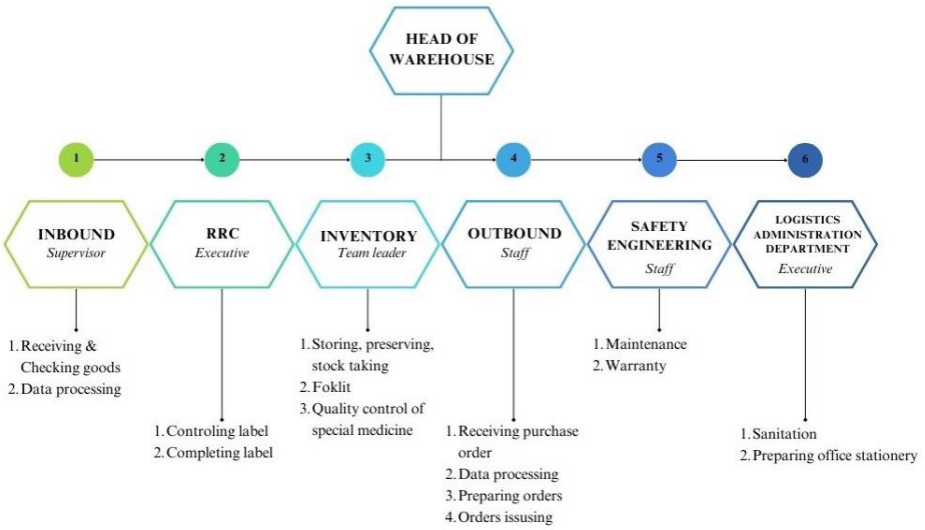


Figure 2.1. Organizational Structure of DKSH Vietnam Co., Ltd
(Source: By DKSH Co., Ltd)

The organizational structure in DKSH Warehouse is shown in the provided picture. Every section of the DKSH Warehouse is clearly accountable for its functions, which work together to produce the best overall operation.

Inbound section: Accepting incoming shipments of goods, verifying the accuracy of the received items against purchase orders or packing lists, and inspecting for any damages or differences are all part of the receiving process.

RRC section: Responsibility for labeling activity for every unit. When goods are brought into the warehouse, they are sorted out in different classes, packaged, and then labeled for easy identification.

Inventory section: This function involves tracking and maintaining product inventory levels in the warehouse. It involves carrying out regular stock counts, updating inventory records, and putting in place mechanisms to improve inventory accuracy and efficiency.

Safety Engineering section: This activity focuses on putting in place security measures to keep the warehouse and its inventory safe from theft, damage, or unlawful entry.

Logistics Administration Department: They are in charge of preparing stationery and maintaining warehouse hygiene.

2.3. The Role of the Warehouse in the business operations of DKSH Vietnam Co., Ltd

Warehouse activities generally refer to the various tasks and processes involved in the management and operation of a warehouse facility. These activities are essential for the efficient storage, handling, and distribution of goods.

For DKSH Vietnam, warehouses provide a strategic storage and inventory management solution. They are essential to the process of receiving goods from suppliers because they guarantee stringent quality control and high standards are followed. Order processing is also handled by warehouses, employees meticulously choose and package goods in accordance with client specifications to ensure timely delivery. Another duty is to manage inventories effectively, using contemporary techniques to monitor and sustain ideal stock levels. Warehouses guarantee that items are wrapped correctly for safe delivery, which helps with packaging and shipping.

2.4. Pharmaceutical Warehouse Conditions at DKSH Vietnam Co., Ltd

The main items in DKSH Warehouse are pharmaceutical products, non-pharmaceutical products, and medical equipment. Therefore, the products must be under the appropriate conditions indicated on the label. It is ensured that humidity and temperature always are exactly as on the label.

For normal products, the storage condition requires a dry, cool, and temperature of 15-25 ° C (sometimes up to 30 ° C), to keep away from sources of damage or direct sunlight.

For special products such as vaccines, depending on the object, special storage conditions call for a particular temperature and humidity: Cold storage (8°C); Deep refrigerator (-10°C); Cooler (2–8°C); Cool (8–15°C); Air conditioner (15–30°C); dehumidifier in warehouses.

Humidity does not exceed 75%.

In order to prevent contamination or the influence of outside forces (especially with regard to sterile drugs), all raw materials and pharmaceutical products must be stored in containers or packages. No acronyms, names, or unofficial codes should be included on any container labels; only the following information is required: Name of the substance, production batch number, and the date of expiration (or retest) based on which pharmacopoeial standards conditions for storage follow the procedures and records when storing and dispensing.

DKSH Vietnam Co., Ltd uses a Data Logger and temperature sensor to check temperature every day and check 3 times per day.

Utilizing a system of sensor-based lights and fire alarms.

Utilizing an automatic generator system, in the event of a power outage, it automatically turns on within less than 1 minute.

Regarding insect control, DKSH will collaborate with a third party to address this issue.

Some other requirements:

- Highrack: height not exceeding 4900mm.
- Pallet: length and width are 1m2 no more than 1m3.
- Speed of forklift: 6km/h.

In general, The DKSH warehouse is a cutting-edge establishment with a wide range of amenities and contemporary features. The items in the warehouse are safety protected and meet standards thanks to its design.

2.5. Classify Inventory in DKSH Warehouse

Goods for release

Generally speaking, "goods for release" means to inventory items that have been prepared and are prepared to be shipped to customers or other destinations.

Goods awaiting labeling

It means that the items must be added additional labels, or Vietnamese lable under the law has been promulgated.

Goods in transit

The goods that are being moved from one place to another are known as "goods in transit." They are typically in transit during shipment or transportation between the points of origin and destination.

Goods Rejection and Return Handling

Return handling is any goods that have been sold or delivered to the company's customer that have preapproval from Client or Bussiness Unit, Client Management Team to return back to the company.

Rejection-Upon-Delivery is any goods that have not yet been sold, not yet been delivered (not handed over) to the customer, and/or the customer did not sign off the Proof-Of-Delivery document, and goods integrity must be assured.

Damaged, Recalled, and Missing Goods

Damaged goods are any goods that have been physically harmed or negatively affected in some other way, making them unusable or unsellable. Damage can happen at any point in the supply chain, including during handling, storage, and transportation.

Recalled goods are inventory items that have been found to have a safety problem, a quality issue, or other issues that necessitate their return to the manufacturer or supplier.

Missing goods include inventory items that cannot be accounted for or are located within the expected inventory count.

2.6. The layout of DKSH Warehouse

In general, the layout of DKSH Warehouse is commendable and reflects a well-thought-out design that prioritizes efficiency and productivity. DKSH Warehouse's layout reflects a well-designed and organized space that enables efficient operations, promotes safety and supports the company's objectives. The attention given to space utilization, flow, safety, accessibility, organization, and scalability showcases a commitment to excellence in warehouse management.

DKSH Warehouse is divided into different areas to facilitate various operations:

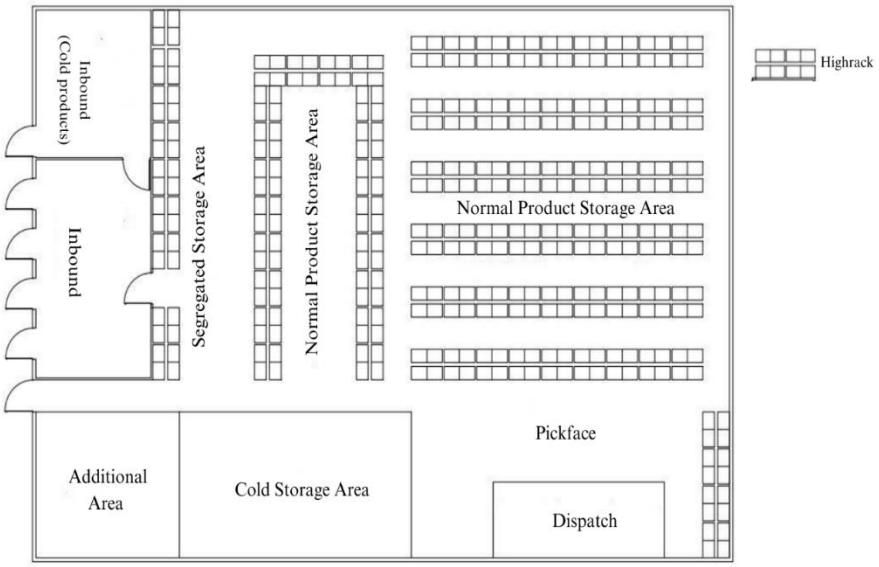


Figure 2.2. Layout of DKSH Warehouse
(Source: By DKSH Co., Ltd)

- Inbound: This area is dedicated to receiving goods. Activities such as inspecting, quantity counting, and physical checking of incoming items take place here.
- Segregated Storage Area: Items that require confirmation or have issues are placed in this segregated area until the matter is resolved or instructions are received from the client.
- Normal Product Storage Area: This section is designated for storing various types of items, including pharmaceutical and non-pharmaceutical products that need to be kept at a temperature range of 23-25°C.

- Pickface: This area is specifically used for preparing retail items. It serves as a staging area where products are organized and made ready for order fulfillment.

- Cold Storage Area: Items such as vaccines, chemicals, or other temperature-sensitive products that require storage temperatures ranging from -10 to 8°C are stored in this controlled environment.

- Dispatch: This area is responsible for the final stage of the logistics process. Goods are prepared and organized for delivery to their respective destinations.

2.7. Main Operation Processes in DKSH Warehouse

Please note, this process also applies to the cold storage warehouse.

The brief overview of warehouse management is guidelined below:

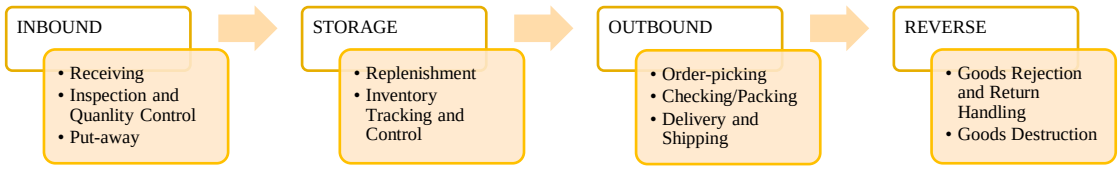


Figure 2.3. Warehouse Management Processes

2.7.1. Inbound

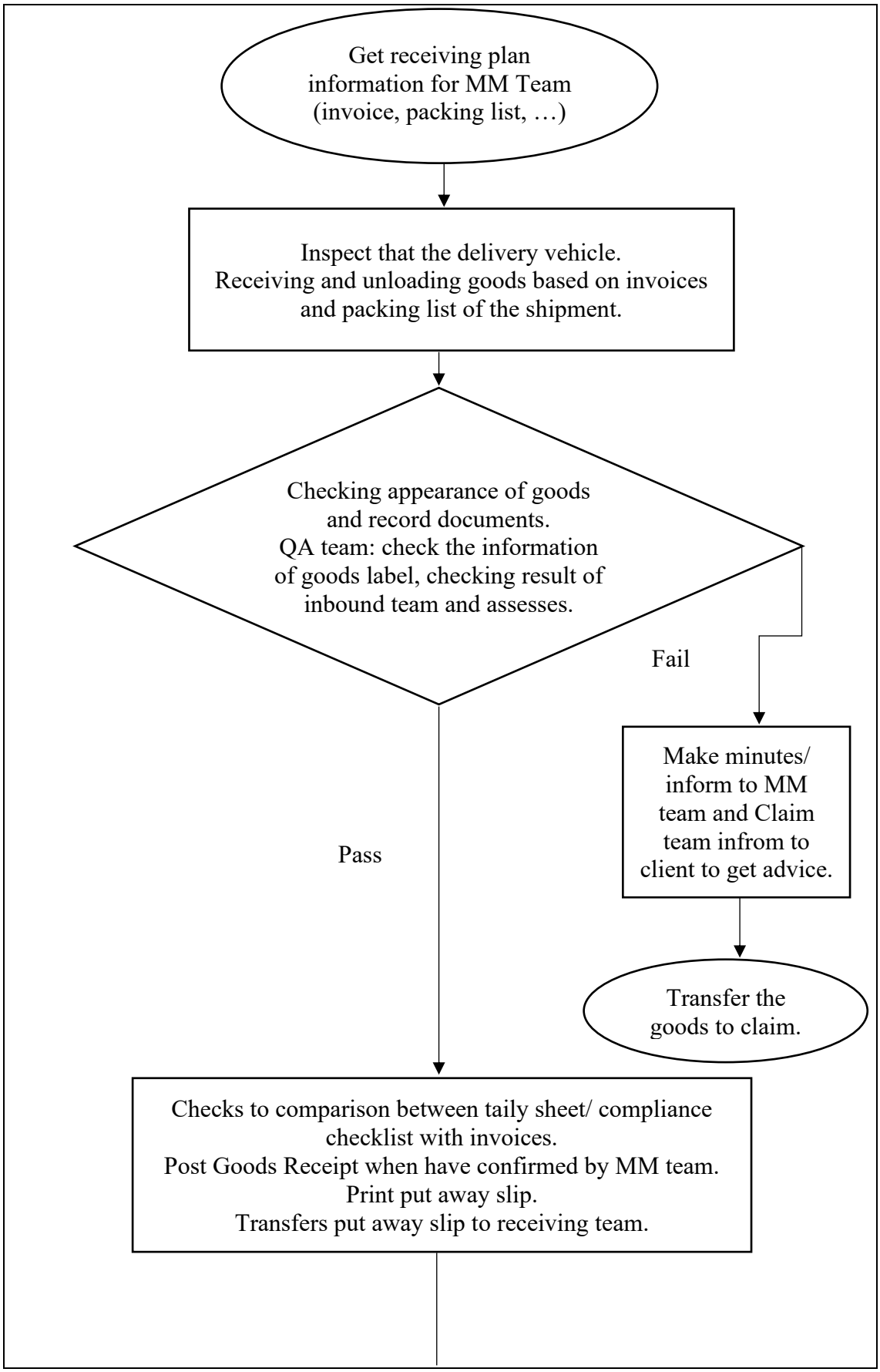
At DKSH Warehouse, inbound operations are essential for the smooth entry of goods and the effective management of inventory. An effective inbound process has been put in place at DKSH Warehouse to ensure accurate receiving, prompt storage, and efficient resource use.

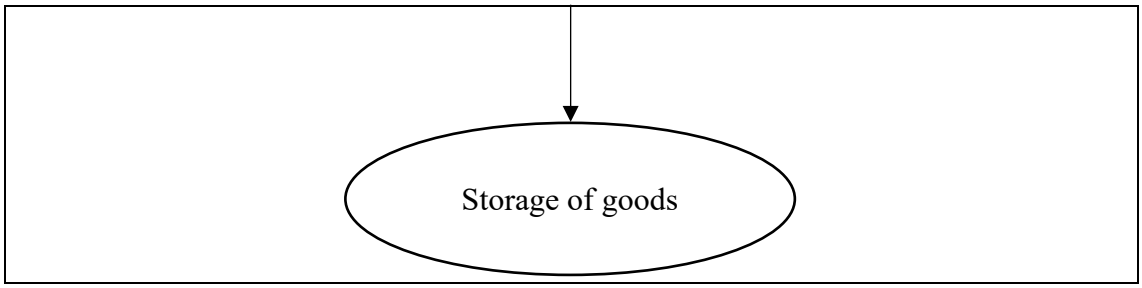
Purpose: To confirm that the quantity and quality of the goods received are accurate and entered into the system to be available for stock.

Supporting documents and tools: Import record, Sale Contract, Packing List.

The procedure:

Table 2.1. Receiving Good Process





After Checking appearance of goods, QA team will comfirm the products which are approved and the green put-away slip “UNRESTRICTED INSPECTION” and transfer directly to saleable area. For goods in redressing condition, stick yellow put-away slip “QUALITY INSPECTION”. Then receiving team will check actual goods according to information in put away slip and confirm the information to system in quarantine area. The goods in the quanrantine area have two statuses redressing or waiting for the clients to get advice.

All of the processes in DKSH warehouse must be input on the SAP system in order to follow accurately inventory.

2.7.2. Storage

2.7.2.1. Process of Checking Inventory

After the goods in the quanrantine area are under the responbitity for the Inventory team.

Quantity, location, and batch number of each medicine being imported and exported; drugs are imported and exported in accordance with the FEFO FIFO principles. For this reason, checking inventory is very important, in contrasting the actual quantities of products or goods with the inventories that have been recorded. This helps maintain ideal stock levels, identify discrepancies, and ensure the accuracy of inventory records.

Schedule of checking inventory: Checking inventory must ensure all goods in the warehouse shall be checked daily, monthly, and quarterly.

Table 2.2. Frequency checking inventory in DKSH Warehouse

Area		**Cycle stock count**	**Cycle stock account**	**Quarterly stock count**
Outbound	Pickface	Tuesday, Thursday & Friday: all of bins	N/A	All of bins
	Highrack	Tuesday, Thursday & Friday: last movement bins	Tuesday, Thursday & Friday: cycle bin once monthly	All of bins
Inbound		Tuesday, Thursday & Friday: all of bins	N/A	All of bins

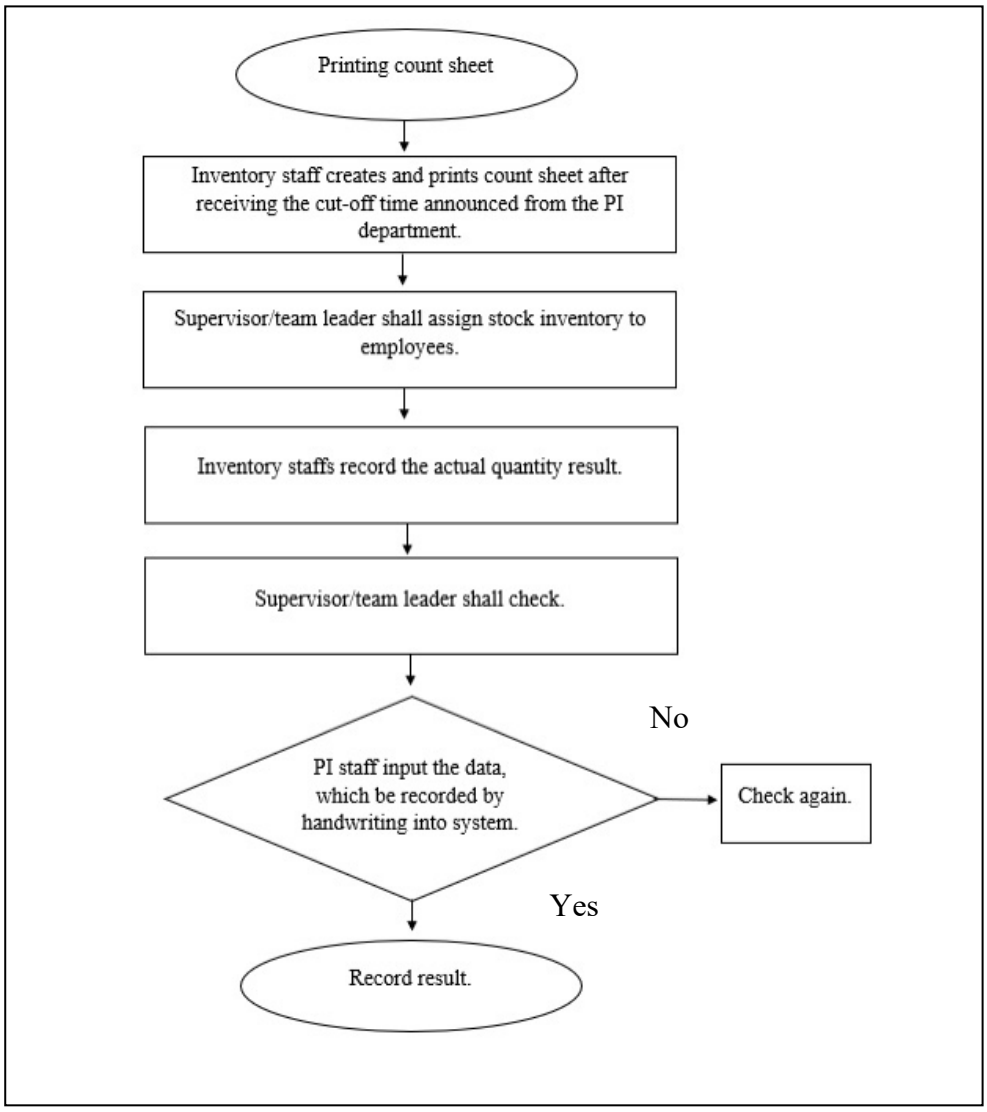
Purpose:

- Ensuring all of the goods are in stock right between reality and the system.
- Detecting stock discrepancies to trigger remedial solutions in time.

Supporting documents and tools: SAP system, counting sheet.

The procedure:

Table 2.3. Checking inventory process in DKSH Vietnam Co., Ltd



2.7.2.2. Process of Replenishment

The main goods in DKSH warehouse belong to FMCG industry, therefore they control the inventories as following the Replenishment Philosophy. Replenishment activity must be performed and examined frequently in order to ensure the goods meeting customer demand.

Replenishment activity will conduct consistently on weekdays, Inventory System team perform transaction in system to print out replenishment slip.

Purpose: Keeping inventory is always enough for sale.

Responsibility: Inventory team, Put-away team, Inbound team.

Supporting documents and tools: SAP system, replenishment slip.

The procedure: Inventory System team perform transaction in system to print out replenishment slip. After that, reach truck team check information which shows on replenishment slip, scan Transfer order (TO) number then move product to destination bin, then scan the destination bin and confirm in the system.

During replenishment process, inventory staff must ensure checking description of product, batch, expiry date, quantity in physical and compare to replenishment slip. All replenishment slips must be completed within a day and enough stock to picking process.

2.7.3. Outbound

An essential component of DKSH's warehouse management is outbound operations. Picking, inspecting, and shipping goods to customers or other locations are all included in these operations. DKSH Warehouse uses effective outbound procedures to ensure accurate and timely order fulfillment.

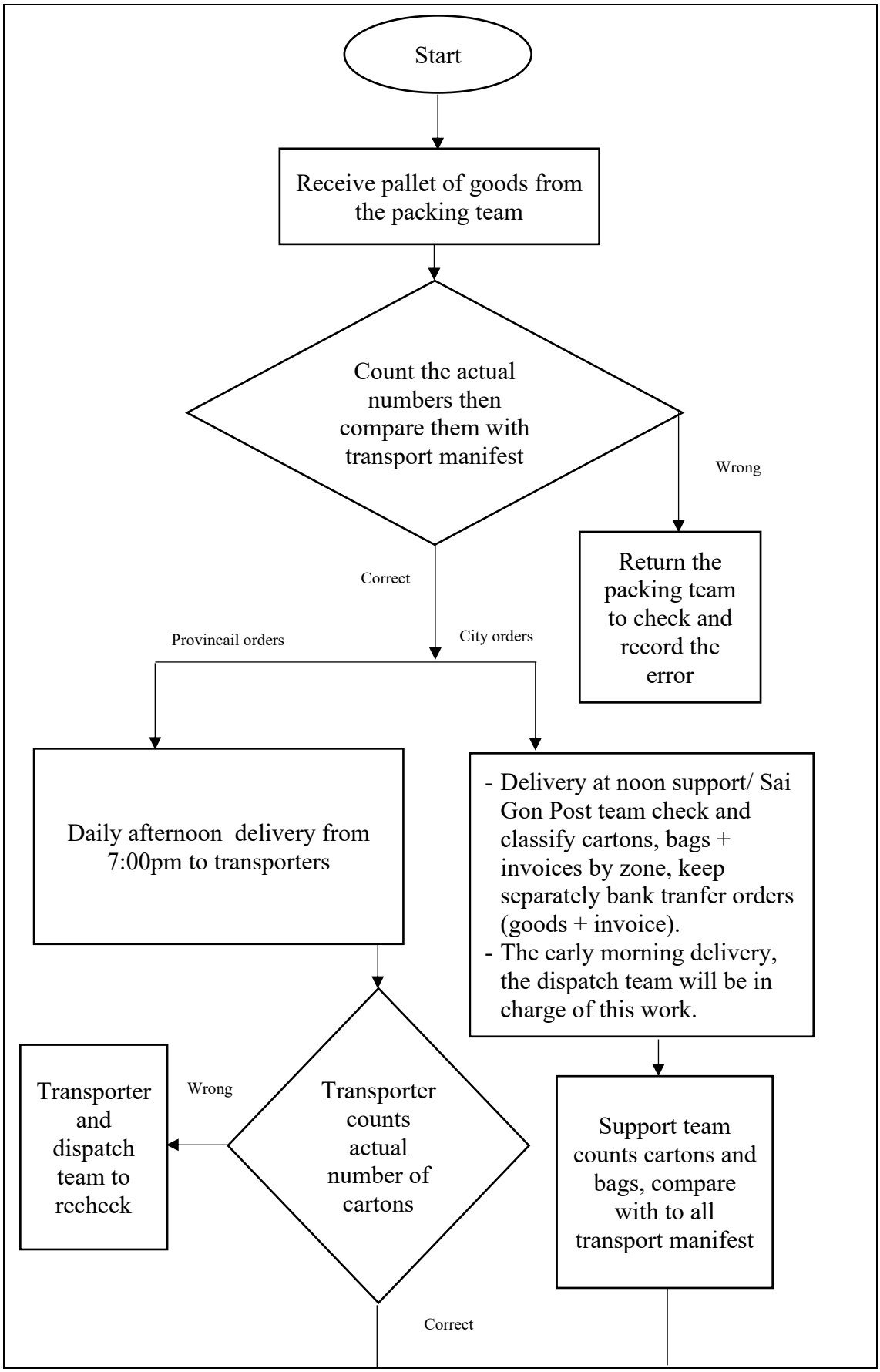
Purpose: To guarantee that all products are perfect before they are delivered to customers.

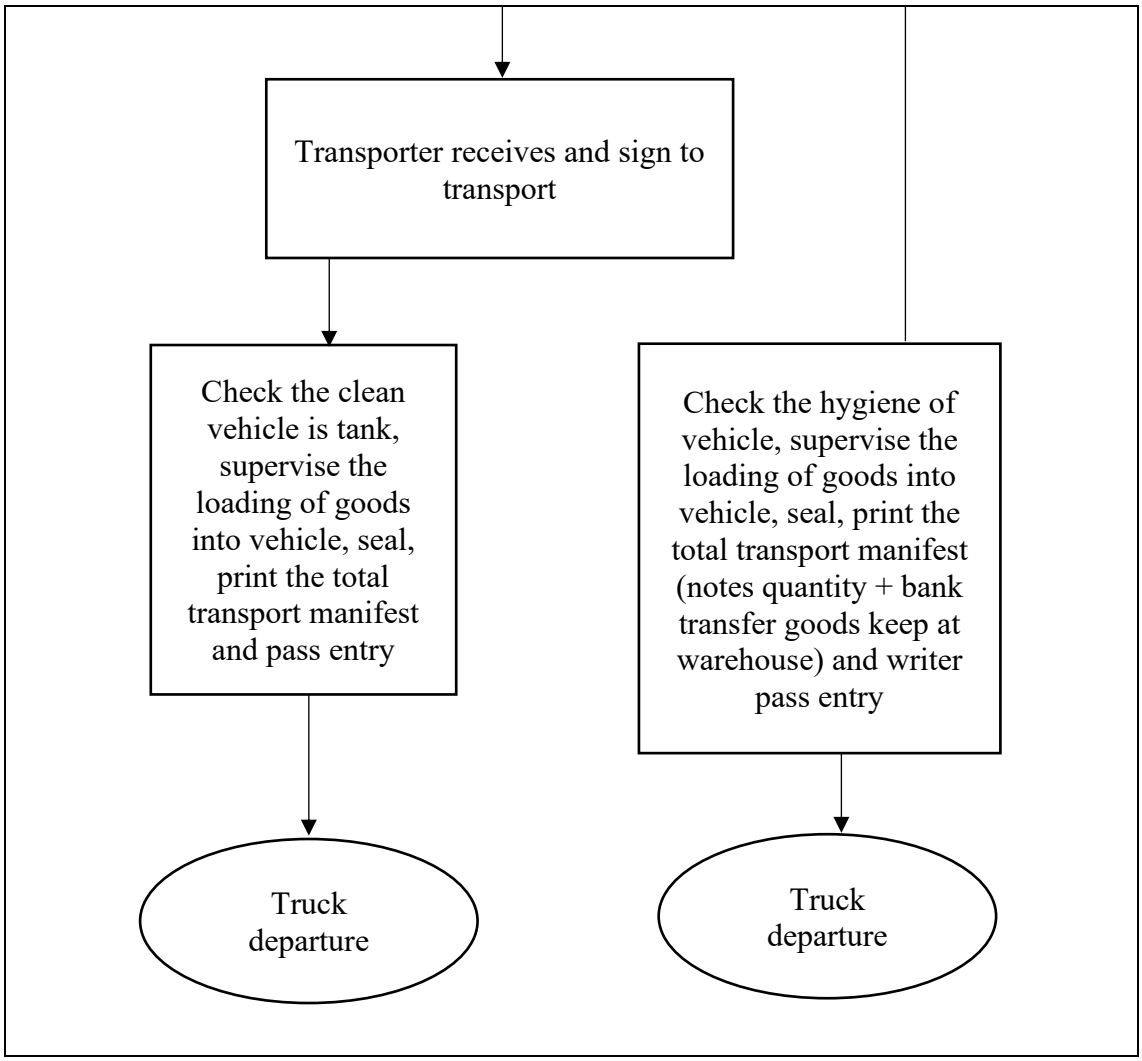
Responsibility: Supervising the pharmacy and consumer warehouse, Team Leader & Warehouse Staff.

Supporting documents and tools: Sale contract.

Procedure:

Table 2.4. Dispatching Process





2.7.4. Reverse

This process encompasses the identification and documentation of rejected goods, prompt communication with customers, thorough inspections, decision-making for resolution, and continuous improvement efforts to minimize future rejections and plan for destruct timely damaged goods.

2.7.4.1. Process of Goods Rejection Handling

Goods rejections can occur due to various reasons, including product defects, damages during transit, incorrect shipments, or customer dissatisfaction.

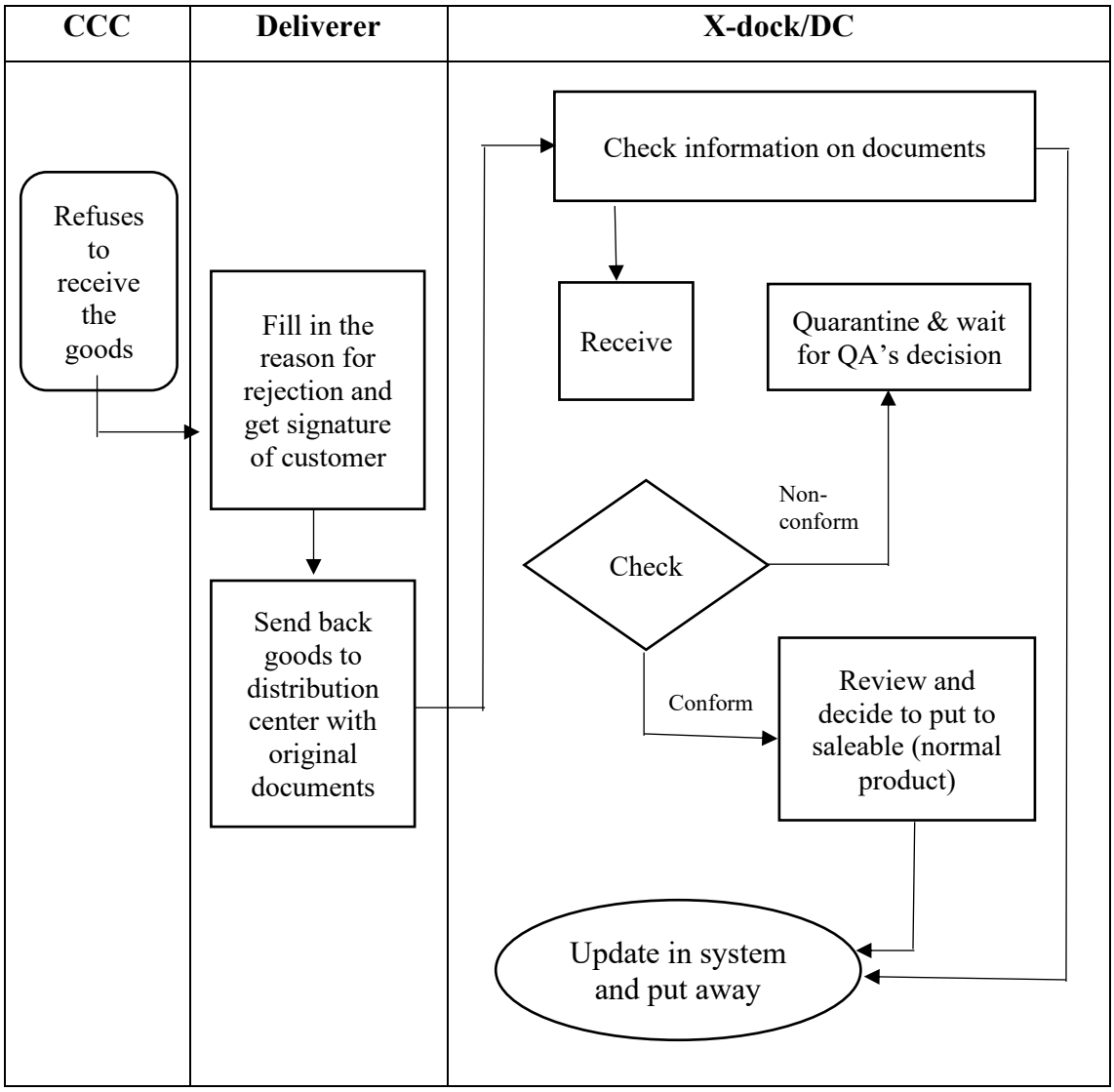
Purpose: The objective of goods rejection handling is to effectively manage and address situations where received goods do not meet the required quality standards or specifications.

Responsibility: DC section, the QA section, the CCC section, the Transportation section, the Client Management section, and the Storage service provider section.

Supporting documents and tools: The documents involve Agreement Minutes.

The procedure:

Table 2.5. Process of Goods Rejection Handling in DKSH Vietnam Co., Ltd



2.7.4.2. Process of Goods Return Handling

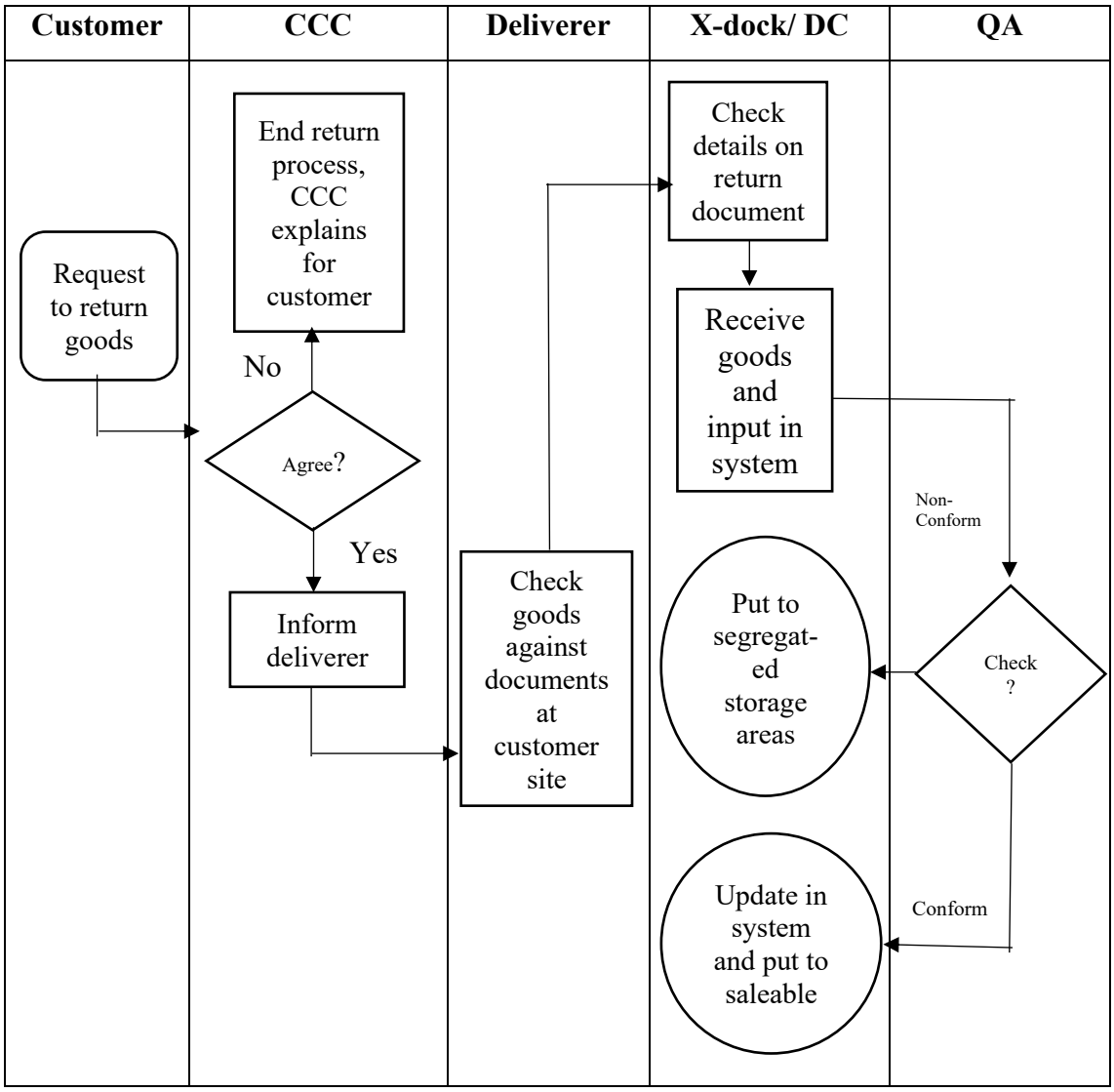
Purpose: The objective of goods return handling is to efficiently manage and process the return of goods from customers.

Responsibility: DC section, the QA section, the CCC section, the Transportation section, the Client Management section, and the Storage service provider section.

Supporting documents and tools: The documents involve Quality Checklist of Returned Product, List Client Get Approval for Releasing Goods Return After Delivery.

The procedure:

Table 2.6. Process of Goods Return Handling in DKSH Vietnam Co., Ltd



2.7.4.3. Process of Goods Return Handling

Goods Destruction is a process of solution goods that are damaged or recalled. And their quality is not enough to release on the market.

DKSH Vietnam Co., Ltd uses a method to destroy by incineration. Destruction of goods will be performed by Siam City Cement Public Co., Ltd.

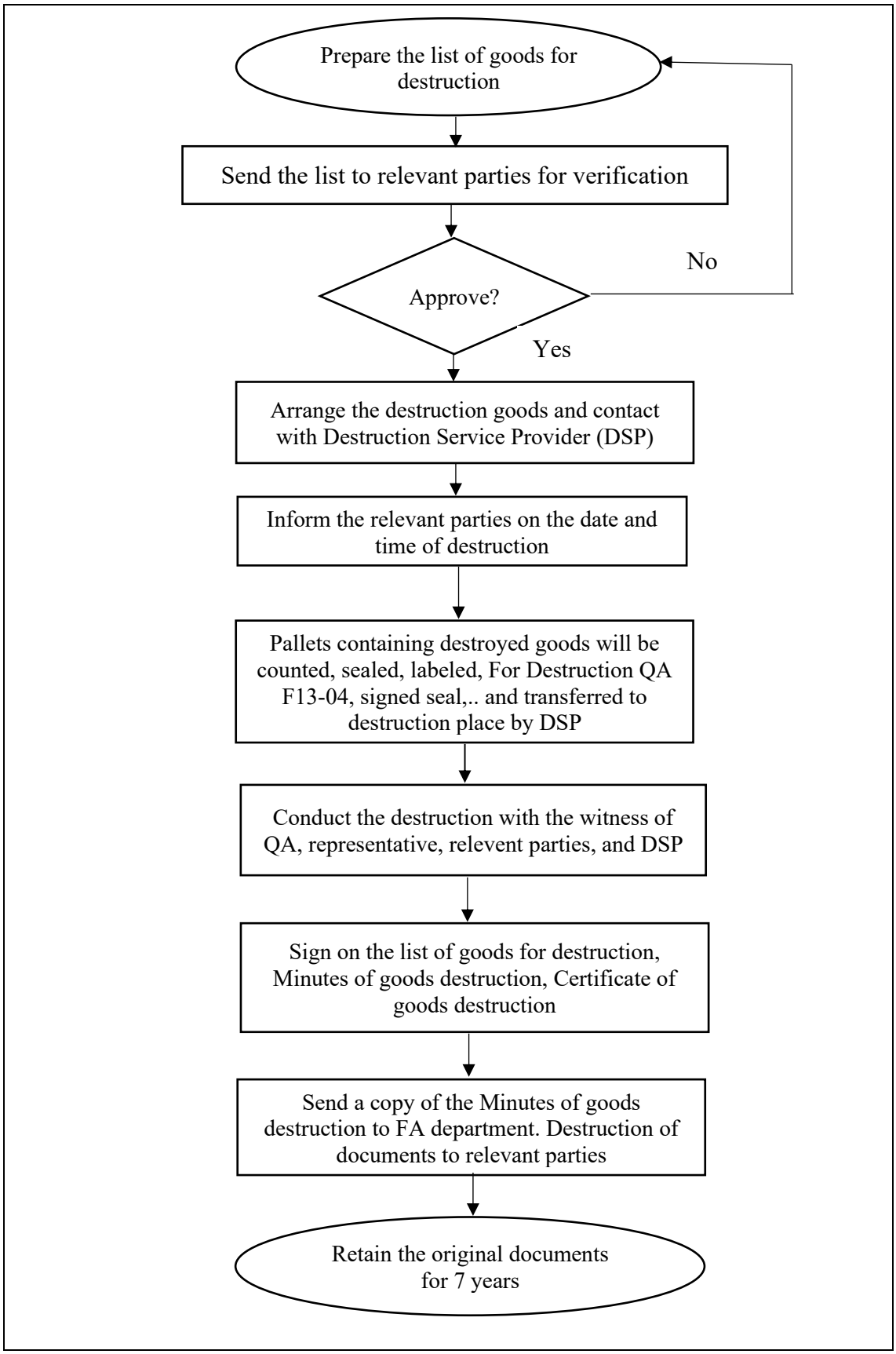
Purpose: This process deals with the mistaking of goods damaged and normal goods.

Responsibility: Dealing with the goods damaged must be approved by the Destruction Council. The head of the organization chooses to create a destruction council every year to plan the destruction of goods, pick the method of destruction, and supervise destruction. The Council must consist of at least three members, one of whom must be the professional in charge of the establishment.

Supporting documents and tools: Goods destruction slip.

The procedure:

Table 2.7. Process of Goods Destruction in DKSH Vietnam Co., Ltd



Chapter 3: FINDINGS AND RECOMMENDATIONS

3.1. Findings

3.1.1. Significance of Factors in the Warehouse Management Process

Human resources are crucial for the smooth operation of a warehouse.

Providing comprehensive training programs to warehouse staff is crucial for ensuring their competence and expertise in handling warehouse operations. Continuous training and development initiatives can help employees stay updated with the latest industry practices and technologies.

In the case of a pharmaceutical warehouse, maintaining appropriate temperature standards is a vital aspect that requires daily monitoring.

- Temperature Control: Implementing a robust temperature control system is essential for pharmaceutical warehouses. This includes utilizing temperature monitoring devices, such as data loggers or sensors, to continuously track and record temperature levels. Regular calibration and maintenance of these devices are crucial to ensure accurate readings.
- Cold Chain Management: For temperature-sensitive pharmaceutical products, maintaining a proper cold chain is critical. This involves controlling and monitoring the temperature throughout the entire supply chain, from manufacturing to distribution. Implementing insulated storage areas, refrigeration units, and temperature-controlled vehicles can help preserve the efficacy of temperature-sensitive medications.

Effective risk management in the DKSH warehouse is essential, particularly in addressing pest-related issues promptly.

- Regular Inspections: Conduct regular inspections of the warehouse to identify any signs of pest infestation. This includes checking for pest droppings, gnaw marks, damaged packaging, or any other indicators of pest activity. Inspections should be carried out by trained personnel who are knowledgeable about common pests and their habits.
- Integrated Pest Management (IPM): Implement an Integrated Pest Management program, which focuses on proactive prevention and control of pests. IPM involves a combination of various strategies, including proper

sanitation, structural maintenance, monitoring, and targeted pesticide use when necessary. This approach minimizes the reliance on chemical treatments and emphasizes long-term prevention.

- Pest-Proofing Measures: Take preventive measures to pest-proof the warehouse. Seal any entry points, such as cracks or gaps in walls, doors, or windows, to prevent pests from entering the facility. Install door sweeps, screens, and air curtains to further minimize the risk of pest infiltration.

Compliance with warehouse standards, including highracks, pallets, forklifts, and warehouse layout, is necessary for fulfilling the facility requirements in the DKSH warehouse.

- Forklifts: Ensure that forklifts used in the warehouse are operated by trained and certified personnel. Regular maintenance and inspections should be conducted to keep the forklifts in optimal working condition. Adhere to safe operating practices, including proper load handling, speed limits, and awareness of pedestrian traffic to prevent accidents and injuries.
- Warehouse Layout: Design the warehouse layout in a way that optimizes space utilization, promotes efficient workflow, and ensures the safety of personnel and products. Consider factors such as clear aisle widths, designated storage areas, logical product flow, and proper signage for easy navigation. Regularly review and update the warehouse layout based on changing operational needs and safety requirements.
- Safety Signage: Install clear and visible safety signage throughout the warehouse to communicate important information and precautions. This includes signs indicating fire exits, emergency evacuation routes, restricted areas, and safety procedures. The signage should be regularly checked for visibility and replaced if damaged or faded.

Implementing inventory classification facilitates efficient management activities and ensures easy control.

- Enhanced Inventory Visibility: Inventory classification provides a structured framework for categorizing and organizing products based on specific criteria. This classification system enables better visibility into the

inventory, allowing warehouse managers to quickly locate and identify items, track stock levels accurately, and make informed decisions regarding restocking, replenishment, and order fulfillment.

- Streamlined Ordering and Replenishment: By classifying inventory, organizations can analyze demand patterns and consumption rates for each category. This information helps optimize ordering and replenishment processes by establishing appropriate reorder points, determining economic order quantities (EOQ), and identifying items that require special attention, such as perishable or high-demand products.
- Efficient Space Utilization: Inventory classification allows for efficient space management within the warehouse. By grouping similar items together, warehouse managers can allocate appropriate storage areas based on the characteristics, size, weight, or special handling requirements of each category. This ensures optimal space utilization, minimizes congestion, and improves accessibility for picking and restocking operations.
- Prioritized Stock Rotation: Inventory classification enables the implementation of inventory rotation strategies, such as First-In-First-Out (FIFO) or Last-In-First-Out (LIFO), depending on the nature of the products. This ensures that items with shorter shelf lives or expiration dates are used or sold first, reducing the risk of obsolescence or waste.
- Accurate Demand Planning and Forecasting: Classifying inventory helps in analyzing historical sales data and demand patterns for different product categories. This data can be used to forecast future demand accurately, plan promotions or marketing campaigns, and optimize inventory levels accordingly. It facilitates better demand planning, reducing stockouts and overstock situations.

Seamless coordination and communication among all departments are imperative for streamlined warehouse processes.

- Clear Roles and Responsibilities: Clearly define the roles and responsibilities of each department involved in warehouse operations. This ensures that everyone understands their specific tasks and how they contribute

to the overall workflow. Establishing clear lines of communication and reporting structures helps avoid confusion and promotes accountability.

- Cross-Functional Collaboration: Encourage cross-functional collaboration among departments involved in warehouse operations, such as inventory management, procurement, logistics, and quality control. Regular meetings, joint planning sessions, and shared information platforms foster collaboration, allowing teams to align their efforts and address challenges collectively.
- Real-Time Communication Channels: Implement real-time communication channels, such as instant messaging platforms, intercom systems, or walkie-talkies, to facilitate quick and efficient communication among warehouse staff. This enables them to relay important information, coordinate tasks, and address issues promptly, reducing delays and improving response times.
- Regular Meetings and Updates: Conduct regular meetings or briefings involving representatives from different departments to discuss ongoing projects, priorities, and challenges. This promotes transparency, aligns objectives, and provides an opportunity for teams to share updates, seek clarification, and provide feedback.
- Documentation and Information Sharing: Establish a centralized system for documenting and sharing relevant information across departments. This includes standard operating procedures (SOPs), work instructions, inventory reports, and performance metrics. A shared knowledge base helps ensure that all teams have access to accurate and up-to-date information, facilitating consistent decision-making and reducing errors.

Additionally, employees in the DKSH warehouse are expected to input every activity into the SAP system to enable accurate inventory tracking and monitoring.

- Real-Time Inventory Visibility: By inputting every activity into the SAP system, such as receiving, picking, packing, and shipping, employees contribute to maintaining real-time visibility of inventory levels. This enables

accurate tracking of stock movements, ensuring that the system reflects the most up-to-date information on product availability and locations.

- Inventory Accuracy and Control: Accurate and timely input of activities into the SAP system helps maintain inventory control. It allows for precise tracking of stock quantities, locations, and status, minimizing the risk of stockouts, overstock situations, or discrepancies between physical and system inventory. This promotes efficient order fulfillment and reduces the need for manual inventory counts.

3.1.2. SWOT analysis of DKSH's warehouse operations

3.1.2.1. Strengths

DKSH Vietnam Co., Ltd., being a 100% foreign-owned company, possesses considerable financial capabilities. This advantage stems from its status as part of a global organization and allows DKSH Vietnam to access substantial funds for various business operations. With robust financial backing, DKSH Vietnam is well-positioned to invest in resources, infrastructure, and strategic initiatives that support its growth and success in the Vietnamese market. This financial strength enables DKSH Vietnam to make substantial investments in state-of-the-art facilities, cutting-edge technology, and a highly skilled workforce, further enhancing its competitive edge and ability to deliver exceptional services to its clients and partners.

Equipment: DKSH warehouse has made comprehensive investments in every aspect, utilizing state-of-the-art and advanced equipment such as high racks, pallets, and more. Adhering to warehouse standards is essential for meeting the facility requirements at DKSH warehouse, which includes complying with regulations related to high racks, pallets, forklifts, and the overall warehouse layout. Great attention has been given to address hygiene concerns within the DKSH warehouse. The temperature conditions in the warehouse are consistently maintained at the appropriate levels for pharmaceutical storage, and the checking temparature must be required daily monitoring.

DKSH warehouse has created clearly standard operating procedures (SOP) and working intruction (WI) for every single department. It showed the

responsibility for every employee is obvious. And checklists for the following drug storage operations: importing, exporting, storing, checking, and controlling when importing, during the process of preservation, and during repackaging.

During the inspection of received goods, a meticulous quality assurance (QA) process is followed at DKSH warehouse. Every product is carefully examined and checked for various aspects, including quality, accuracy, and adherence to specifications. The QA team thoroughly assesses each item to ensure that it meets the required standards before it is placed into storage. This diligent inspection process guarantees that only high-quality and compliant goods are accepted and ready for further handling and distribution within the warehouse.

Furthermore, seamless coordination and communication among all departments from inbound, storage and, outbound are essential for ensuring streamlined warehouse processes at DKSH. To facilitate accurate inventory tracking and monitoring, employees are required to input every activity into the SAP system. This centralized system enables real-time updates and provides a comprehensive view of inventory status, contributing to efficient operations and effective decision-making throughout the warehouse.

The DKSH warehouse places a high premium on risk management, with a particular emphasis on putting safety measures in place. The warehouse has an alarm fire system installed to improve safety. This system allows for early fire event detection and rapid action. In order to minimize any damage and guarantee the safety of both the workers and the entire warehouse facility, this method is essential. To further ensure that temperature conditions are carefully monitored and maintained to preserve the integrity of the stored pharmaceutical items, a sensor temperature system designed specifically for pharmaceuticals is in place.

3.1.2.2. Weaknesses

The warehouse management software system has not been adequately updated and tailored to accommodate the requirements of growth and adaptability.

Technology has not been thoroughly applied to the process of picking and tracking goods.

Inspection: Every single receiving good will be physical checked by QA. They check the box of products such as dented, unclean, cracked, ripped, crumpled...during transportation, and product name, brand name, unit of calculation, specification, date, batch number, expiry date, import/export information, inventory, and reference number. This is a fine activity; however, the staff only conducts the physical checking which does not input them into the SAP system. It may lead to difficulty for future tracking activities.

For instance, when inventory staff retrieves items, the SAP system relies on the order and quantity provided by the customer to the warehouse beforehand to calculate the remaining stock. The staff responsible for consolidating the order will update the system by recording the actual quantity on paper and affixing it to the pallets. Due to this tracking method, the actual quantity of items on the shelves may not be updated immediately during the picking process and sometimes may be inaccurate. As a result, weekly inventory counts three times a week must be conducted, it can increase the labour cost, reduce efficiency.

Inventory tracking method: Currently, the DKSH warehouse uses manual & paper tracking to follow inventory in the warehouse. This method involves recording all transactions on warehouse cards placed at the respective shelves. The warehouse card includes details such as product name, brand name, unit of calculation, specification, date, batch number, expiry date, import/export information, inventory, and reference number. At the end of each shift or during inventory checks, the warehouse secretary updates the stock card information into the system. However, this method has several limitations. It requires a dedicated warehouse secretary, requires frequent notetaking by warehouse staff, consumes time, and is prone to mistakes due to incorrect recording or misplaced goods. Likewise, for cold storage, checking/tracking is also managed by a similar method. And compliance with safety protocols, such as wearing protective gear, when entering, leaving, or working in the warehouse is not consistently enforced. The Standard Operating Procedure (SOP) system is incomplete and lacks proper implementation guidelines. Product identification is done by marking information on self-adhesive labels or using duct tape. Staff members affix the labels above,

below, or next to the respective product rows and write information on them using a brush, pen, or chalk. While this method enhances labor productivity, it has drawbacks such as unclear handwriting, potential confusion, and increased labor costs.

Picking good method: In the field of goods import and export: (memory-based method). Pallet positions are easily recalled by forklift operators, so this approach is very straightforward. When requested, the forklift driver sets up the pallet position on his own and rushes over to the item's location to deliver the goods to the desired location (composing position, outlet). This method has the low labor productivity, high error rate, and low volume and quantity of handled goods are just a few of the drawbacks. Shifting shifts and rotating goods using the FIFO method (first in, first out) can be challenging. Likewise, the picker staff also uses the memory-based method to collect and pick the goods following the order slips. It is very hard to remember the good’s location in every bin, sometimes, the stretch of road to pick up the good will be reiterated twice because the staff may not keep the road in their mind.

The items between actual in stock and SAP system lack of communication because there is nothing to connect them together. Despite the quantity of goods being entered into the SAP system by the MM team, when the goods are transferred to the warehouse, employees are unable to track them, and the system is unable to update the necessary information due to the lack of any supporting device or tool for warehouse staff to monitor the movement. Therefore, it is difficult to tracking inventory.

Human resources: At DKSH, the human resources department is facing difficulties integrating technology into their work processes. Employees have not been adequately trained to use technological tools, resulting in a heavy reliance on manual labor. This leads to time wastage and increased costs. To address this issue, DKSH needs to invest in comprehensive training programs to equip employees with the skills and knowledge to effectively use technology. Additionally, they should collaborate with technology experts to explore automation and digital

solutions. This will help DKSH increase productivity, improve competitiveness, and be prepared for the challenges of an evolving digital world.

3.1.2.3. Opportunities

Vietnam is a promising pharmaceutical market with a solid foundation for development. With a large population of over 100 million people and a rapidly aging population, it provides favorable conditions for the growth of the pharmaceutical industry. By 2038, Vietnam is projected to become an aging population country, with the proportion of people over 60 years old reaching over 20%, and this ratio could increase to 25% by 2049. This implies that the demand for healthcare and treatment through drugs and pharmaceuticals will continue to rise (Phuong, 2023). DKSH can seize this opportunity to expand its business operations and enhance its presence in distributing pharmaceutical products in Vietnam.

On the other hand, the standard of living and education level of the Vietnamese population are improving day by day. Increasing incomes, along with a growing awareness of healthcare, particularly after the Covid-19 pandemic, are driving the willingness to spend on healthcare services, including pharmaceuticals.

Additionally, pharmaceutical consumption is also experiencing strong growth. Although still lower compared to some other countries, the improvement in income and health awareness is encouraging the Vietnamese people to use pharmaceuticals for their healthcare needs.

Moreover, the signing of free trade agreements such as the EVFTA has created favorable conditions for Vietnamese pharmaceutical businesses to access the EU market. Under this agreement, many pharmaceutical products from Vietnam are exempted from or enjoy reduced tariffs when exported to the EU. With its experience and global distribution network, DKSH can leverage these agreements to expand its business scale and increase its access to the EU market for its pharmaceutical products (Phuong, 2023).

The government has implemented policies to enhance the competitiveness of enterprises in the pharmaceutical industry. The recently issued Decision No. 1165/QD-TTg approves the national strategy for the development of Vietnam's

pharmaceutical industry until 2030 and provides a vision until 2045. This document provides guidance for the development of the pharmaceutical sector and its enterprises, with specific goals to increase autonomy, grasp technology, and transform Vietnam into a high-value pharmaceutical production center in the region (Phuong, 2023).

In summary, the favorable conditions in Vietnam's pharmaceutical market, such as a large population, rapid aging, increasing living standards, and growing pharmaceutical consumption, present opportunities for DKSH. The company can utilize its expertise and global distribution network to expand its business operations and enhance its presence in distributing pharmaceutical products in Vietnam. Additionally, DKSH can take advantage of free trade agreements to expand its activities and access the EU market for its pharmaceutical products.

3.1.2.4. Threats

Vietnam's efforts to join global economic organizations like the World Bank, ASEAN, APEC, and WTO highlight its commitment to integrating into the global economy. In the pharmaceutical distribution sector, Vietnam has adopted a more open policy towards foreign investors. However, it is important to note that the import market for pharmaceuticals in Vietnam has become increasingly competitive, with stricter requirements imposed.

DKSH should be aware of the risks associated with economic downturns, political uncertainties, and changing regulations in different countries where it operates. These factors can affect business operations and require the company to adopt flexible strategies to mitigate potential risks and uncertainties.

Furthermore, DKSH should keep an eye on technological disruptions. Rapid advancements in technology and the emergence of disruptive business models can impact traditional service offerings in the pharmaceutical distribution industry. Continuous adaptation and innovation will be crucial for DKSH to stay competitive and meet the evolving needs of the market.

Additionally, DKSH should carefully navigate the potential risks and challenges associated with its operations in different countries. Economic downturns can impact consumer spending and demand for pharmaceutical

products, affecting DKSH's revenue and profitability. Political uncertainties, such as changes in government policies or trade relations, can introduce instability and disrupt business operations. Moreover, changing regulations in the pharmaceutical industry, including import requirements and quality standards, can create compliance challenges and increase operational complexity for DKSH.

In the face of technological disruption, DKSH needs to proactively embrace digital transformation and leverage new technologies to optimize its service offerings and stay ahead of the competition. The advent of e-commerce platforms, telemedicine, and data analytics can reshape the pharmaceutical distribution landscape. DKSH should invest in digital capabilities, explore partnerships with technology providers, and develop innovative solutions to meet the evolving needs of its customers and clients.

Overall, while Vietnam's open policy and increasing demand for imported pharmaceuticals present opportunities for DKSH, the company must also be vigilant in managing risks related to economic, political, regulatory, and technological factors. By staying adaptable, proactive, and innovative, DKSH can position itself for long-term success in the dynamic pharmaceutical distribution industry.

3.2. Recommendations

3.2.1. Identify the Problem

3.2.1.1. Identify the Problem

DKSH Vietnam Co., Ltd is a part of the FMCG industry, and the main products are pharmaceutical and non-pharmaceutical (skincare products, medical products, etc.). The characteristic of an FMCG warehouse is fast turnover. This means that an FMCG warehouse must efficiently and quickly handle and distribute goods to meet the increasing demands of customers. Therefore, optimization processes in warehouse to reduce the costs of operation is a high recommendation.

From the SWOT analysis above, the author discovered the roof of problems in DKSH warehouse processes:

- Firstly, the inventory control in DKSH warehouse is currently managed through manual and paper tracking systems.

- Secondly, the picking, loading, and unloading of goods in DKSH warehouse still rely on memory-based methods.
- Last but not least, there is still a significant reliance on handwritten records and paper-based processes in the DKSH warehouse.

In general, there is no connection between actual items with items on the SAP system which leads to difficulty tracking inventory. The SAP system does not usually automatically update but must be brought up-to-date by a daily checking process.

3.2.1.2. Optimization options

a. Barcode versus RFID

- **Tracking Inventory Method**

To begin with, it is crucial to replace the current manual and paper-based tracking inventory method with a more advanced and efficient approach.

Comparing the two methods, barcode and RFID (Muller, 2011):

Table 3.1. Barcode versus RFID

Barcode	RFID
Require a direct line of sight to the printed barcode.	Do not require a direct line of sight to the printed barcode. Can be read through most objects.
Reading range generally up to 15 feet (depending on equipment).	Reading range up to approximately 300 feet (depending on equipment).
Approximately a half second or more to successfully complete a read.	Read vates up to 40 or more tags per second.
Bar code labels are more vulnerable. If a label is dirty, torn, falls off, etc., it can't be read.	RFID tags are more rugged because they are in a plastic cover and can even be embedded in a product (further protecting it from external forces)
Barcodes have no read/write capability. Once printed no new information can be added.	RFID tags can be read/write devices. A RFID reader can communicate with the tag and alter as much of the information as the tag design will allow.

Standard bar codes identify only the manufacturer and product, not the unique item (e.g., each widget is identified the same as every other identical widget — not that specific widget).	RFID tags identify the specific object.

From above table, it can be seen that RFID method is better than barcode. Howerver, RFID tags may be purchased for anywhere from $0.3 to $0.6. The price varies according on the kind of goods; luxury products, for instance, are more likely to require RFID tags than regular ones. Therefore, the cost of RFID tags is recognized as having a significant impact on the technology's uptake. But in addition to RFID tags being very expensive for organizations to purchase, RFID systems also come with high-priced gear and software. Employee training on new RFID technology is another expense that must be considered. Since there is a significant risk involved in making a complete investment in RFID technology, several firms still view it as a developing technology (Doan, 2017).

Hence, in this case, using RFID is not suitable for the DKSH warehouse. Because it belongs to the FMCG industry, in-stock items in the warehouse are mainly priced under 500.000 VND. There is evidence to demonstrate that the costs are approximate and are based on a 100,000 square foot warehouse with 25 operators and 2,500 SKU, and including the fixed overhead for wireless networks, antennas, software, and implementation when applying FRID method was 108,000$ for Radio frequency hand-held terminal and 120,000$ for Radio frequency visual hand-held unit (Richards, 2018).

Tracking inventory by barcode method combining with SAP system using in DKSH warehouse will generally provides higher accuracy and more robust data management capabilities in inventory tracking and management scenarios.

- **Order Picking Goods Method**

In the literature review chapter, Mr. Richards highlights the significance of the activities of receiving, loading, and order picking in the overall cost of warehouse operations. According to his analysis, these activities contribute 10%, 10%, and

35% respectively to the total cost. It is worth noting that any reductions in these figures would directly result in a decrease in the total cost incurred by the warehouse. Therefore, optimizing and streamlining the processes related to receiving, loading, and order picking can lead to substantial cost savings for the warehouse.

The DKSH warehouse currently utilizes the SAP system for inventory tracking integrated pick by label method. However, to enhance the efficiency and accuracy of inventory management, it is recommended to integrate SAP with either RFID or barcode scanning technology.

Comparison between 3 picking methods (Richards, 2018):

Table 3.2. Comparison between 3 picking methods

	Pick by label	*Barcode scanning with gun*	*RFID*
Application & pick area	• Most operations. • Where there is very little systems support. • Low-cost areas. • < 100 lines per hour.	• Most operations. • < 100 lines per hour.	• High value goods. • Items requiring accurate traceability. • 200–300 lines per hour.
Benefits	• Low cost. • Reasonably accurate. • Single stage picking operation although two stage update operation. • Flexible. • Quick implementation. • Low maintenance.	• Improved accuracy. • Paperless. • Flexible. • Real time stock update. • Ability to deal with multi-sku locations.	• Very high accuracy. • High productivity. • Real time stock update. • Track and trace throughout warehouse.
Drawbacks	• Low pick rate. • Not hands free.	• Low/medium pick rate.	• Cost of hardware. • Cost of tags.

• Duplicated tasks. • Need to print labels. • Not real time. • Training can take some time. • Label information may be difficult to read. • Can damage product if mistakes made. • Requires return to desk for further instructions.	• Not hands free. • Can take longer than 1st stage paper picking. • Cost of hardware. • Requires barcode on every item. • Barcode standards. • Requires system interface. • Real time system requires wireless receivers throughout warehouse. • Requires maintenance.	• Requires suppliers to attach tags/labels. • Read distances very short. • Requires international standards. • Requires system interface. • Cost of maintenance. • Issues with certain types of products (liquids, metals).

The comparison table above illustrates the differences between three picking methods. While the pick by label method and barcode scanning method with a gun may have lower costs compared to RFID, their performance is comparatively poor. Implementing RFID in the warehouse can lead to a reduction in overall costs and optimization of warehouse activities.

Although RFID technology is highly effective, the biggest barrier is the cost involved. Implementing RFID in a warehouse can increase the cost per product. Therefore, using barcode technology would be the most reasonable choice in this situation.

Barcode systems are generally more cost-effective to implement than RFID systems. Barcodes are widely adopted, and the infrastructure required for barcode scanning is relatively affordable and accessible. Barcode labels are inexpensive to produce, and barcode scanners are widely available at various price points.

Additionally, barcode systems have proven to be reliable and efficient for many businesses. They offer accurate data capture, streamline inventory management processes, and integrate well with existing systems and software. Barcode scanning can provide significant improvements over manual and paper-based methods without incurring the higher costs associated with RFID implementation.

Combining barcode-based tracking and barcode-based picking is a common and effective approach in many warehouse and inventory management systems. Here's how the two can work together:

Tracking with Barcodes:

Utilize barcode labels to track and identify products throughout the warehouse. Each product is assigned a unique barcode that contains relevant information such as the item's SKU, description, and location. Barcodes can be placed on product packaging or storage bins/shelves.

Inventory Management:

Scan barcodes using handheld barcode scanners or integrated scanning devices at various stages of the inventory management process. This includes receiving goods, moving them to different locations, and conducting regular stock checks. The scanned information is captured in a centralized inventory management system, allowing real-time updates and accurate stock level tracking.

Barcode-Based Picking:

When it's time to fulfill customer orders or move products from the warehouse for other purposes, barcode-based picking is employed. Each order or task is associated with a set of barcode identifiers representing the specific items to be picked. Warehouse staff use handheld barcode scanners or mobile devices with built-in scanners to locate and scan the barcodes on the products, confirming that the correct items are being picked.

Verification and Validation:

The barcode scanning process during picking ensures accuracy by verifying that the scanned barcode matches the expected item. The system can provide instant feedback, such as visual or auditory cues, to confirm successful scans or

identify any discrepancies. This helps minimize picking errors and ensures the right products are selected.

b. Improved Process

- **Tracking Inventory Method**

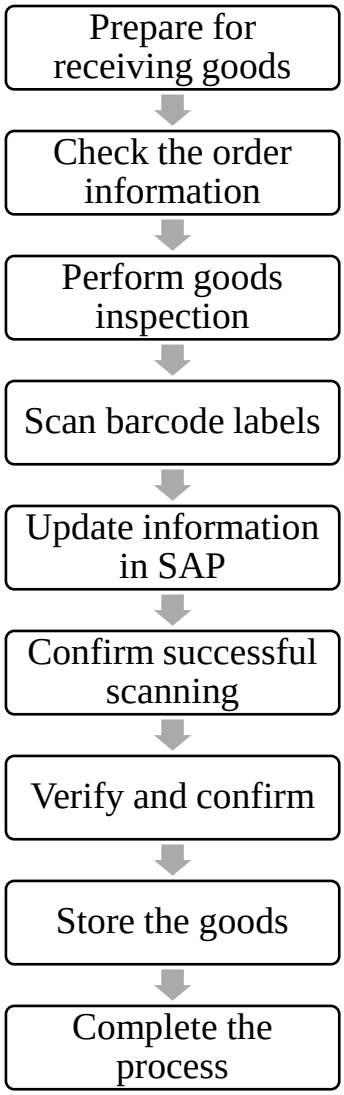


Figure 3.1. Tracking Inventory Process

Describe verbally:

f1: Prepare for receiving goods

The employee prepares the receiving area, including a workstation, barcode scanning equipment, and a computer or mobile device integrated with SAP.

f2: Check the order information

The employee checks the order information, including the quantity of products, specific items, and relevant details. Verify the order information against the data in the SAP system to ensure alignment.

f3: Perform goods inspection

The employee inspects the received goods according to the order, confirming the quantity and condition of each item. If there are any discrepancies, the employee notes them down and notifies the relevant department for resolution.

f4: Scan barcode labels

Using a barcode scanning device, the employee accurately scans the barcode labels on each product. The barcode labels provide unique identification information and link it to the corresponding data in the SAP system.

f5: Update information in SAP

The scanning device transmits the barcode data to SAP. SAP updates the product information, including SKU code, description, quantity, storage location, and other relevant details.

f6: Confirm successful scanning

Check the scanning device or mobile device screen to confirm the successful barcode scanning. If any errors occur or scanning is unsuccessful, the employee needs to rescan the barcode until it is successful.

f7: Verify and confirm

The employee checks the updated product information in SAP to ensure alignment with the order information and actual goods received. If any discrepancies are identified, the employee adjusts and updates the information in SAP accordingly.

f8: Store the goods

After receiving and inspecting the goods, the employee stores the products in the designated storage location in the warehouse.

f9: Complete the process

The employee completes the goods receiving process and proceeds with other tasks. If necessary, the employee can generate reports on the goods receiving process and communicate with relevant departments.

- **Order picking Method**

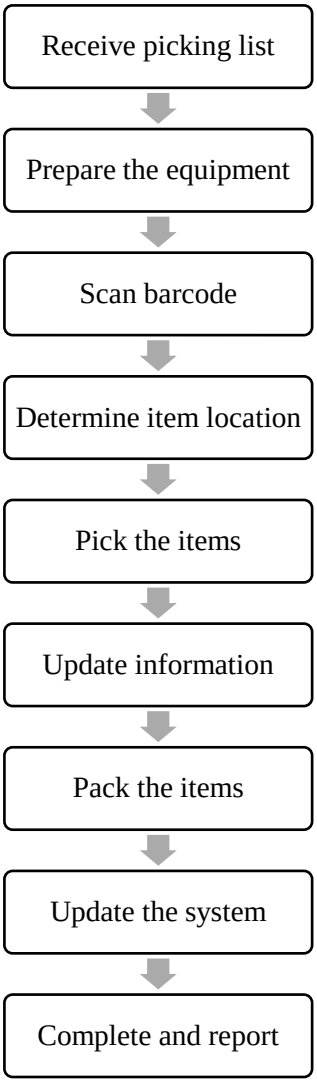


Figure 3.2. Order Picking Process

Describe verbally:

f1: Receive picking list

The employee receives the picking list from the warehouse management system or other sources of information.

f2: Prepare the equipment

The employee prepares the barcode scanning device (gun scanning device) and ensures that it is connected and functioning properly.

f3: Scan barcode

The employee uses the gun scan to scan the barcode on the picking list and on the corresponding product or storage location.

f4: Determine item location

The system identifies the location of the item based on the barcode and displays the necessary information on the gun scan device.

f5: Pick the items

The employee moves to the designated item location and retrieves the required quantity of items.

f6: Update information

After picking the items, the employee updates the quantity picked and relevant information on the gun scan device.

f7: Pack the items

The items are packed according to the company's packaging procedures.

f8: Update the system

The employee updates the information on the quantity picked and immediately updates it in the warehouse management system to ensure accuracy and real-time updates.

f9: Complete and report

The picking and packing process is completed, and the results are reported to the relevant department or management system.

The figure showcases a picker actively engaged in the order picking process, utilizing a handheld device commonly referred to as a barcode scanner gun:

Figure 3.3. Picking with hand-held barcode scanner
(Source: (Richards, 2018))

Additionally, the combination of barcode scanning with a gun device and an AVG (Automated Guided Vehicle) system further simplifies the order picking process.

In this scenario, along with the picker using the barcode scanner gun, automated guided vehicles are employed to assist in the movement of goods within the warehouse. These vehicles are equipped with sensors, cameras, and navigation systems that allow them to autonomously navigate through the warehouse aisles. These vehicles will automatically move to follow the picker.

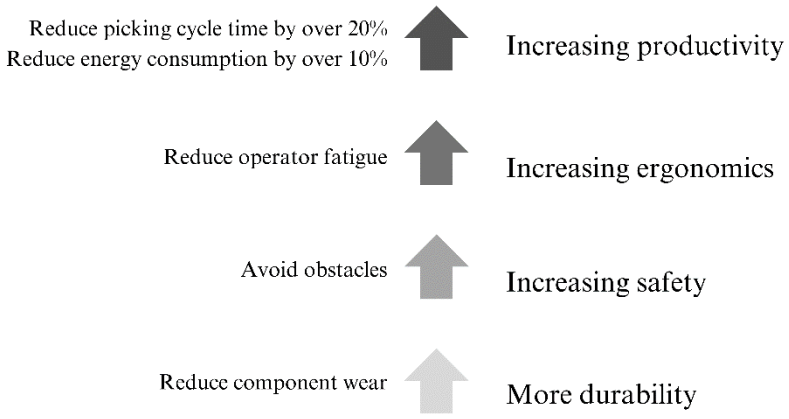


Figure 3.4. Toyota's remote drive solutions
(Source: By (Richards, 2018))

c. Human Resources Organization

When wanting to implement a new technology in a warehouse, it is necessary to prepare a meticulous training process. A careful training process helps employees grasp the new technology and understand how to apply it to their daily work. This helps enhance work efficiency, minimize errors, and strengthen effectiveness in warehouse management.

Below is a concise version of the training process for personnel using barcode scanning to track and prepare items:

1. Introduction to barcode scanning and warehouse management system.
2. Instructions for using barcode scanning devices.
3. Instructions for the barcode scanning and item tracking process.
4. Instructions for the item preparation process using barcode scanning.
5. Knowledge and skills assessment.
6. Real-world practice and monitoring with support and supervision.
7. Continuous training and improvement to maintain high performance.

3.2.2. The constraints and limitations of the research subject

One limitation of the essay is the use of the observational method and reliance on previous studies, which may introduce subjectivity. Additionally, the limited availability of relevant documentation during the observational process may compromise the accuracy of the findings.

Furthermore, relying on the observational method and previous studies can introduce biases and subjectivity into the research. The researcher's interpretations and judgments based on their observations may not always align with objective reality. Additionally, the lack of comprehensive documentation or data during the observational process can limit the accuracy and completeness of the findings. It is important to acknowledge these limitations and consider them when interpreting the results of the study.

CONCLUSION

Based on the information provided, it can be concluded that the logistics industry in Vietnam has significant potential for growth. The ongoing infrastructure upgrades and expansions in transportation are aimed at meeting the increasing market demands. The application of emerging technologies such as IoT, artificial intelligence, and blockchain in optimizing transportation processes and warehouse management further enhances the efficiency of the logistics sector. Moreover, Vietnam's young and skilled workforce, along with favorable training and skill development opportunities, contribute to the favorable conditions for the continued development of the logistics industry.

Furthermore, the research conducted on warehouse operations at DKSH Company highlights the importance of optimizing warehouse management processes. By employing an exploratory case study method and an inductive approach, the study aims to contribute to the existing knowledge in warehouse management and provide practical insights for improving operations at DKSH. The proposed solution for optimizing warehouse management operations at DKSH emphasizes the need for efficient and streamlined processes to enhance overall operational efficiency and effectiveness.

Overall, the combination of a conducive business environment, infrastructure improvements, technological advancements, and a skilled workforce in Vietnam presents a favorable landscape for the logistics industry to thrive. By continuously optimizing warehouse operations and embracing innovative solutions, companies like DKSH can position themselves to successfully navigate the evolving market dynamics and achieve sustainable growth in the logistics sector.

REFERENCES

a. Book

Jr, J. H. (2008). *APICS Dictionary.* (T. Edition, Ed.)

Muller, M. (2011). *Essentials of Inventory Management* (2nd ed.). United States of America: AMACOM.

Richards, G. (2014). *Warehouse Management: A Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse* (2nd ed.). Great Britain and the United States: Kogan Page Limited.

Richards, G. (2018). *Warehouse Management A complete guide to improving efficiency and minimizing costs in the modern warehouse* (3rd ed.). Great Britain & the United States: Kogan Page Limited.

Schroeder, R. G. (2007). *Operations Management Contemporary Concepts and Cases* (3rd ed.). Singapore: McGraw-Hill Education.

Thomas L.Freese. (1998). *The Warehouse Management Handbook.* United States of America: Edwards Brothers, Inc., Ann Arbor, MI.

Tompkins, J. A. (1998). *The Warehouse Management Handbook.* USA.

b. Report

Andiyappillai, N. (2020). *Digital Transformation in Warehouse Management Systems (WMS) Implementations.* USA. Retrieved from https://bit.ly/3Sgpf2U

Dennis W. Krumwiede & Chwen Sheu. (2002). *A model for reverse logistics entry by third-party providers.* USA.

Doan, B. (2017). *Radio Frequency Identification (RFID) and its impacts on logistics activies.*

Duc, H. L. (2020). *Optimizing Pharmaceutical Company's Warehouse System.* Retrieved from https://www.theseus.fi/bitstream/handle/10024/349142/Ho_Luong_Duc.pdf?sequence=2&isAllowed=y

Falkenberg, S. F. (2023). *The use of novel data and optimization algorithms in warehouse.* Retrieved from

file:///C:/Users/ASUS/Downloads/Falkenberg_Sven_WHU_Diss_2023.pdf

John J. Bartholdi III & Steven T. Hackman. (2014). *Warehouse & Distribution Science. The Supply Chain and Logistics Institute School of Industrial and Systems Engineering Georgia Institute of Technology Atlanta.* Retrieved from https://www2.isye.gatech.edu/~jjb/wh/book/editions/wh-sci-0.96.pdf

Michael ten Hompel & Thorsten Schmidt. (2007). *Warehouse Management. Automation and Organisation of Warehouse and Order Picking Systems.* Springer.

OECD. (2021). *Logistics sector in Vietnam.* Retrieved from https://www.oecd.org/daf/competition/oecd-competition-assessment-reviews-vietnam-2021.pdf

U.S.S. Dharmapriya & A.K.Kulatunga. (2011). *New Strategy for Warehouse Optimization – Lean warehousing.* Kuala Lumpur, Malaysia. Retrieved from https://bit.ly/3tXcm3K

c. Wed

DKSH Vietnam. (n.d.). Retrieved from DKSH: https://www.dksh.com/vn-en/home/about-us/about-dksh-vietnam

Phuong, H. (2023, 11 29). *Doanh Nghiệp*. Retrieved from https://kinhtevadubao.vn/: https://kinhtevadubao.vn/buc-tranh-khoi-sac-cua-doanh-nghiep-nganh-duoc-2023-27692.html

Xu hướng vi mô hóa hệ thống quản trị kho hàng. (2023, 04 27). Retrieved from Trang thông tin điện tử Logistics Việt Nam: https://logistics.gov.vn/dich-vu-logistics/kho-bai/xu-huong-vi-mo-hoa-he-thong-quan-tri-kho-hang