

## Possible Warehouse Management Model According to Turkish Customs Regime Codes

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**Abstract:** Mankind has been in motion since its existence. The known history, dating back to 10,000 years ago, includes an adventure that started with hunter-gatherer and later became an agricultural society and settled-life after rehabilitating plants, and finally, today's lifestyle was formed with industrial and technological revolutions. In almost every step of this adventure, it is seen that human beings need to store the products they need in order to continue their life. After the hunter-gatherer living human beings catch their prey and gather the food they need, after the settled human beings harvest their products, and the human beings who buy the products they need today, they think about the future and feel the need for storage by nature. Just as individuals have storage needs at the micro level, businesses at the macro level want to keep various products such as raw materials, spare parts and intermediate products related to their business activities in their warehouses when needed, and they store certain product groups for this purpose. When we look at it today, it is seen that warehousing activities, which are a part of logistics processes as much as in-house warehouse activities, have an important place. Considering the product inventory costs, businesses want to buy the goods or products needed in the production process "on-time" by outsourcing the warehousing service, rather than keeping the goods or products they need within their own structure. At this point, it is seen that warehousing and warehousing activities as a part of the supply chain have gained more importance than ever, especially with the effect of technological developments in international trade. Warehouses and customs warehouses, which were seen as a cost element in both domestic and international logistics activities, respectively, today appear as economically effective structures that reduce shipment and customer order time cycles and most importantly provide value-added services. In short, we can see this pillar of logistics activities, which we encounter as a warehouse in domestic logistics activities and a customs warehouse in international logistics, as "the gear without moving that enables the machine to work all parts of a machine-like non-moving gear". In this study, after defining the warehouse, which is an important link of the supply chain, and focusing on its importance, the concept of warehouse used in international logistics will be explained and the effect of customs regime codes on the storage of goods in the customs warehouse will be explained.

**Keywords:** Custom warehouse, Custom regime codes, Logistic, Warehouse systems, Foreign trade

## **Introduction**

In recent years, it has been understood once again that effective and efficient warehouses are important for the logistics sector and businesses. There are many factors in the effective use of warehouses, from the trained human factor, the technological infrastructure and equipment they have to the location where they are located. However, it should be noted that one of the most important factors in the development of an effective warehouses is the increase in foreign trade activities with the integration of the country into the global economy where the warehouses are located. When we look at the Republic Period Turkey, the “24 January Decisions” put into practice by Turgut Özal, who was appointed as the Prime Ministry Undersecretary in 1979, is one of the biggest steps taken for the globalization of the economy, the increase in import and especially export activities. In the 2000s and later, it is seen that the state apparatuses took steps towards the development of exports and the increase of imports in the direction of raw material supply. To give an example from recent history, the Turkish Statistical Institute reported a total increase of 12.457 billion dollars in exports in January 2018, with an increase of 10.7% compared to 2017. Imports, on the other hand, showed an annual increase of 38% in January 2018 and amounted to 21.524 billion dollars in total (Türkiye İstatistik Kurumu, 2018:1). The decisions taken for the adaptation of the economy to the global economy and the development of import-export have enabled the improvement of the infrastructure in the logistics sector, the modernization of the equipment used and the increase in the number of qualified employees in the sector. Warehouses and customs warehouses were also positively affected by this process.

Global developments, especially in the international trade environment in 1980 and later, caused global companies to show interest in the logistics sector. Considering that the logistics sector is one of the fastest growing sectors in Turkey with an average annual growth of 20% since 2002, it will be better understood why global companies show such interest in the sector (Export.gov.tr, 2017:1). With the effect of our country's geopolitical position, it is seen that foreign investors invested approximately 1.9 billion dollars in the logistics sector, which is so open to development in 2010 and later. In this context, it is seen that the number of warehouses in our country has increased due to the increase in international trade and the decrease in warehouse investment costs (Deloitte, 2013:27). Considering the number of customs warehouses, it is seen that there are 604 state warehouses and 555 private warehouses currently in active use (T.C. Ministry of Customs and Trade, 2018:1). It can be said that these investments will continue to increase in the coming years. Considering these developments in trade, the necessity of the logistics industry and businesses to have a well-functioning storage area comes to the fore.

## **Warehouse, Warehouse Concept, Definition and Function**

Before moving on to the detailed explanation of storage activities, it would be useful to explain what the concept of warehouse means. According to Richards' definition of warehouse, a warehouse is expressed as "a transfer point where all received goods are shipped as quickly, effectively and efficiently as possible" (Richards, 2014:1). In the Oxford English dictionary, a warehouse has the dictionary definition of “a large building where raw materials or finished goods can be stored before they are distributed for sale” (Dictionary, 2018:1). In short,

warehouses can be seen as physical structures and can be said to be waiting or transfer points for products or goods. The structures must have a physical and technological infrastructure so that the products or goods stored in these structures are not damaged.

Warehouses have various types according to their functionality. Businesses can store products or goods in one of these warehouse types, depending on the service they need. If we look at the warehouse types in general, Chand's classification of different types of warehouses comes to us. According to the classification made by Chand;

- Private warehouses: In these warehouses, which are only open to companies' own use, the products or goods belonging to the enterprise are stored. They have private property and are not open to the use of other businesses (Chand, 2014:2).

- Public warehouses: These are warehouses open to public use where the operator is generally the public authority. Especially the small and medium-sized enterprises are preferring such warehouses. They are operated according to public policies (Chand, 2014:2). These warehouses can be shown as an example of outsourcing of businesses. The warehouses owned by the PTT (Post, Telephone, Telegraph) in our country can be given as examples of such warehouses. In addition, such a warehouse open to the general public provides an advantage as it does not require the user to invest in equipment (Warehousing, 2015:2-3). Another advantage of such warehouses is that the user does not have to pay any tax on the ownership of the warehouse (Depoculuk, 2015:2-3). Finally, in a public warehouse, the user can move the product to another warehouse easily and at low cost whenever he wants (Warehousing, 2015:2-3).

- Customs warehouses: These are the customs storage areas where the goods are kept as long as the custom process continues in international trade, import and export transactions. After the customs clearance process is completed, the export or import of the goods found in these warehouses takes place (Chand, 2014:2).

- Other types: This group includes warehouses such as commercial goods warehouses, cold storage or refrigerated warehouses (Chand, 2014:2).

In addition to this grouping made by Chand, it would be useful to give details of the concept of customs warehouses, which have an important function in the international logistics and supply chain and are the main subject of our study. By definition, a customs warehouses are a physical warehouse where the imported goods under customs supervision that have not been released for free circulation are placed or where the goods in free circulation are stored for export in cases where the customs authority is allowed in special cases (Canitez, 2021:187). As can be understood from the definition, the main feature that distinguishes custom warehouses from warehouses is that they are bonded areas. This feature distinguishes customs warehouses from warehouses in terms of establishment and operating conditions. In addition, being bonded areas means that they have a special status. Secondly, although warehouses are generally used in domestic logistics, it can be said that

customs warehouses are a pillar of the international logistics chain. In addition to these two differences mentioned above, there are other points where the concepts of warehouse and customs warehouse differ, and more detailed information will be given on this concept in the second part of our study.

The most basic and primary function of warehouses, as the name suggests, is the storage of a product or item. Warehouse activities are described as follows in Richards' Warehouse Management book: "Basic processes in the warehouse remain the same over time. The product is stored, processed, maybe some value-added transactions are made and finally shipped" (Richards, 2014:2). As stated before, with the developing logistics activities and the differentiation of the business world's way of doing business and the change in the perspective of logistics, warehouses are no longer seen as just warehouses. In addition to its primary function, warehouses now have economically effective functions such as balancing prices, sharing risks and packaging. It would be useful to briefly explain these functions.

First of all, if we look at the function of balancing prices, it is known that the prices of goods and services in the free market are determined under market conditions. However, economic crises and negative developments can cause market prices to deteriorate. Price stability can be achieved by releasing the products that are kept in the warehouse to the market in cases where there is a shortage of supply, and by keeping the products in the warehouses in case of a demand shortage. In short, it can be said that warehouses act as stabilizers in balancing the market prices of products. In the function of sharing risks, it has a function in the direction of protection of warehouse products. Warehouses can minimize potential loss/leakage or damage risks thanks to their physical infrastructure. In addition, thanks to this function of warehouses, businesses can transfer these risks to third stakeholders and reduce the risk on them to zero. Finally, according to the packaging function, warehouses today can have a movement function, albeit smaller than in the past. The "non-moving gear" analogy mentioned in the summary loses its function at this point. Especially with the development of e-commerce activities, it is seen that the packaging operations for the product are carried out by the warehouse operators in the warehouses designed in this direction. On the international trade side, it is seen that the goods can be traded by making simple packaging (handling) at transit trade operations in bonded warehouses or customs warehouses. In both transactions, it can be said that an added value for the product or goods is created together with the warehouse activity. These and similar warehouse functions show us that warehouses are not just places used to store goods.

It is useful to briefly mention the warehouse working system, which will be detailed in the following sections, in this section. Theoretically, warehouses work on three streams: input, output and internal operation. It involves taking the input product to the warehouse and transferring the output product to the customers. Internal operations include the processes of storing the product as a result of creating a value by grading and, if necessary, packaging.

Warehouse activities, which generally consist of receiving, backup storage, advanced collection, packaging, sorting and The warehouse working system can be summarized in this way as a theoretical framework. As can be seen in the figure, a product or item enters the warehouse, can be cross storage or stored, if necessary, it can go through the packaging, sorting and consolidation stages, and at the last stage, it is shipped to the customer. consolidation, and shipping, are illustrated in Figure 1 as cyclical:

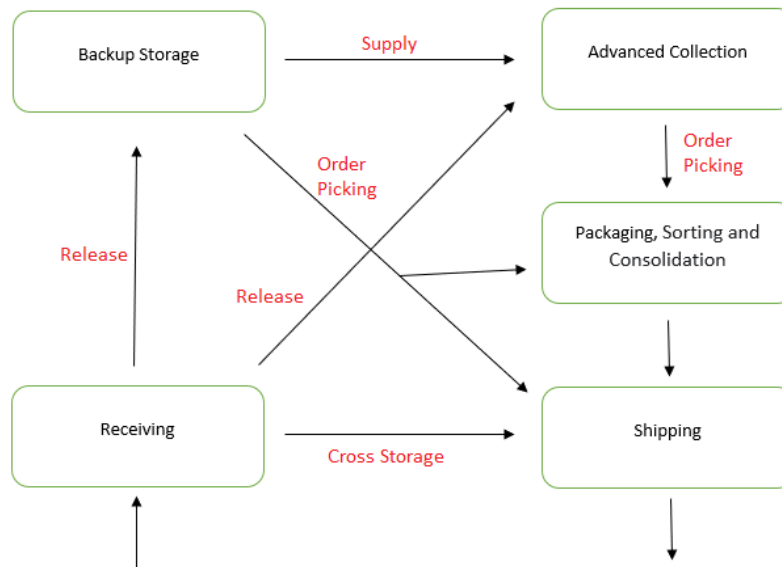


Figure 1. Warehouse Activities

Source: Kay, 2015:24.

## The Importance of Warehouse in Logistic Processes-Supply Chain

It was stated that warehouses are a part of the logistics activities of the enterprises. Logistics departments in enterprises are responsible for all this activity. It is known that the goals and objectives of the warehouses operating within the system determine the goals and objectives of the logistics system (Komarova, 2016:12). As can be understood from this sentence, warehouse and warehouse management affect the entire system. If we explain this statement in a little more detail, as an example, factors such as the location of the warehouse, its inner working system, storage type, working principle determine how the other pillars of logistics will work. It is useful to look at the definition of Martin Christopher, a professor of marketing and logistics, on the importance of warehouse and warehousing. According to Christopher's definition of logistics; "it is essentially a planning framework in supply chain management that aims to create a single plan for the flow of products and services from the manufacturer to the end consumer." (Christopher, 2016:12). Within the framework of this planning, the warehouse step emerges as the main factor that determines the working principles of the system.

It is possible to compare the logistics described in the previous section with warehouse activities. It can be seen that there is a holistic relationship between the two concepts that complements each other. While warehouse processes refer to operational processes, logistics processes refer to information flow and the management of the process. Therefore, in supply chain management, it can be said that logistics and warehouse management have complementary roles.

In supply chain management, the warehouse has a two-way function. The first is called inbound logistics and the second is called outbound logistics. Transportation of semi-finished or raw materials from suppliers to manufacturers is called inbound logistics, and transportation of finished products from manufacturer to consumer is called outbound logistics (Shurbi, 2017:1). Within these inbound and outbound logistics processes,

materials, information and resources are managed across a network, which is a warehouse and warehouse management pillar. This governance and coordination create the supply chain structure. The objectives of supply chain management are similar to warehouse management and objectives. The purpose of the supply chain is to increase efficiency, create added value and satisfy customers like warehouse management (Lalwani & Mangan, 2016:11).

As the name suggests, the supply chain got this name because it resembles a chain formed by many rings. The rings do not make sense on their own, but become functional when they come together and form a whole. We can list these links of the supply chain as material supply, storage of products, production and distribution of goods and consumption of the product (Komarova, 2016: 7-8). As can be seen here, the storage of the product appears as a chain in the supply chain process.

As a part of the supply chain, warehouse and warehouse management are in connection with different disciplines. First of all, storage, production and distribution activities take place in the warehouses of the enterprises. Therefore, it is useful to renew the link between the warehouse and the supply chain once again. In order for operational processes in warehouses to be smooth, there must be harmony between logistics and supply chain. It is not possible to think of a supply chain without logistics and therefore to think of warehouse management. It would be better to explain the relationship between logistics and supply chain management with different disciplines with the help of Figure 2.

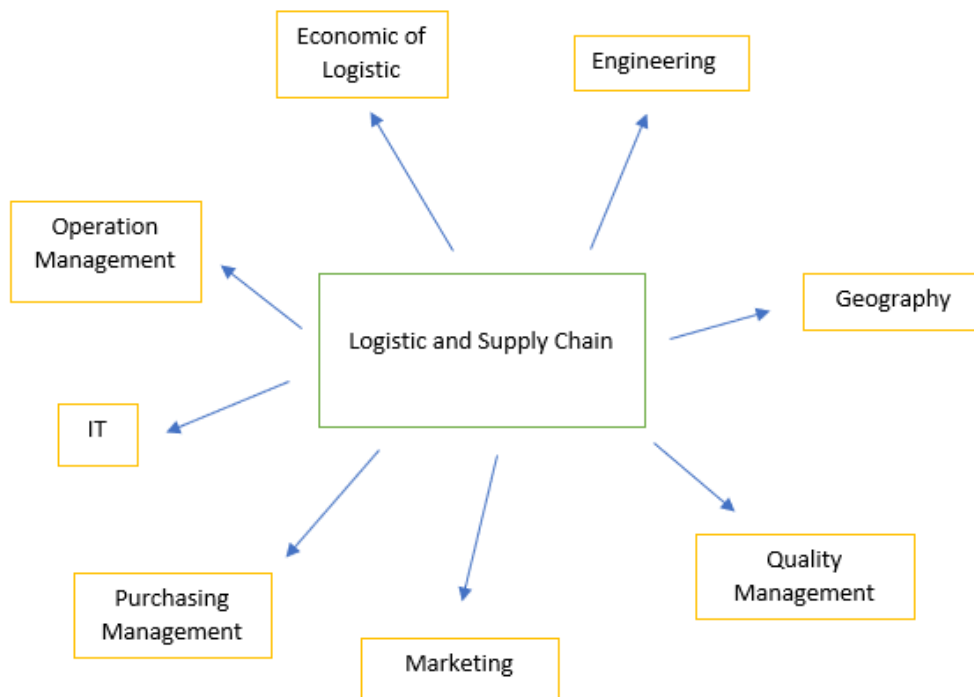


Figure 2. The Relationship between Logistic and Supply Chain with Different Disciplines

Source: Lalwani & Mangan, 2016:17.

In Figure 2, Mangan and Lalwani mention that logistics and supply chain management are related to various

disciplines, especially operations management, IT, economics of logistic and marketing. As a part of supply chain management, we can say that warehouse and warehouse management are indirectly related to these disciplines.

It is seen that the supply chain interacts with different disciplines as well as with other departments inside or outside the company. The departments that supply chain and logistics interact can be listed as sales, customer service, finance, accounting, purchasing and production (Logistics, 2017:2-3). The business world has recently experienced how this interaction resulted in positive or negative results. In the Covid-19 pandemic, which entered our lives in January 2020, the supply chain was broken due to the closures. It has been observed that while manufacturers are faced with problems such as raw materials and spare parts, consumers are faced with the problem of not finding products. A similar situation has been appeared as wheat supply shortage in the global economy after the start of the Russia-Ukraine war, or the problem of semi-finished products especially faced by the automotive industry after the political crisis in Taiwan, which has the world's largest semiconductor chip manufacturers, or the inability to transfer products between suppliers due to the container crisis. It can be seen as examples of the negative effects of such problems in the supply chain, especially on the sales, finance, purchasing and production departments of the enterprises.

### **Smart Warehouses under Logistic 4.0**

Today, in order for businesses to adapt rapidly to the changes caused by the increasing demand and competitive environment, virtual structures have started to be needed in addition to the physical structures throughout the entire life cycle, from production to distribution. In order to meet this need, the concept of Industry 4.0 has emerged. This concept is based on the concept of digital-physical systems, which is the integration of physical processes with computers (Erol et al., 2016:497). Thanks to the developed information, communication and sensor technologies, it is possible to collect, analyse and interpret data for use in logistics processes. With the integration of physical processes with computers, the measurability, efficiency and sustainability of logistics systems increase significantly (Rübmann et al., 2015:62). The starting point of the concept of Logistics 4.0 is the concept of Industry 4.0, which entered our lives for the first time at a fair held in Hannover (Erdoğan, 2021: 17). According to Barreto et al., Logistics 4.0 has emerged as a result of the use of the advanced internet, which is called digitalization, which provides real, simultaneous communication between people and machines with the coordinated work (Barreto et al., 2017: 1248). In addition, Schumacher et al. (2016) states that the concept of Logistics 4.0 emerged with the integration of innovations and applications of cyber systems into the logistics sector. If an inference is made from these expressions, it can be stated that Logistics 4.0 is the application of the innovations brought by Industry 4.0 to logistics. This adaptation has been realized with the integration of innovation, software and applications brought to the sector by the concept of Logistics 4.0. With these innovations, it is expected to provide advantages to businesses in certain areas such as customer satisfaction, production optimization, and minimization of storage and production costs (Lin and Jones, 2009:542).

According to Witkowski (2017), with the application of Industry 4.0 in the logistics sector, productivity and sustainability opportunities have begun to be provided. With Industry 4.0, which is integrated into the logistics



sector, it is aimed that all suppliers, warehouses, market shelves or vehicles work in harmony with each other. With the use of smart machines and software, stock levels can be instantly controlled, disruptions in the supply chain can be observed, and efficiency and time savings are ensured by constantly monitoring. When all these are considered together, idle times will be reduced in all processes of the supply chain and it will be possible to use resources more efficiently (Witkowski, 2017:765). In addition, it is thought that the human factor needed in operational steps will decrease thanks to the technology provided by Industry 4.0. The fact that the need for the unqualified human factor will decrease due to the need for software brought by Industry 4.0 in operational processes or the human factor will become completely robotic in some parts will cause an increase in the demand for skilled and technology-adapted employees in the management and operation departments (Rutkowski et al., 2015:18).

According to Rübman (2015), the Logistics 4.0 transformation started with the integration of information technologies into logistics processes. In this transformation, at every stage of the supply chain, people and machines are in communication with each other at every stage of logistics. In this way, standardization of networks in the supply chain and simultaneous information sharing can be achieved. Considering all factors, production and distribution processes can respond to all expected or unexpected changes in a shorter time and flexibly (Rübmann et al., 2015: 63). In addition, since the integration of information technologies can predict the problems that may be encountered in the supply chain in the near future, it is predictable and contributes to the sustainability note.

Similarly, Domingo (2016) talks about the network structure in Logistics 4.0. He mentions that the supply chain will be a wide network that is accessible to all relevant stakeholders. This wide network will be used as an internet platform where all orders from customers to suppliers can be managed in real time thanks to cloud technology. Domingo also mentions that transportation will be provided by fully autonomous forklifts on programmed routes, thus reducing warehouse costs and error rates (Domingo, 2016:35). This statement of Domingo supports Rutkowski's view that the need for unskilled employees working in operational processes will decrease.

As one of the information technologies used under Logistics 4.0, the concept of the Internet of Things (IoT) emerges. According to the report of DHL, one of the largest logistics and supply providers in the world, the concept of "Internet of Things", which connects every step of the supply chain, is one of the factors that have the greatest impact on increasing operational efficiency in the logistics industry. Thanks to technology and internet infrastructure, the interconnected pallets and objects in the warehouse, which gain the ability to communicate with each other, provide a smarter and more manageable warehouse management (Tike, 2015). With the sensor technology placed on forklifts and carriers used to transport products in the warehouse, such vehicles can be controlled, thus minimizing the risk of accident and injury and achieving operational gains (Lee, 2016:43). Another advantage of this technology is that warehouse managers can monitor these vehicles and ensure that operations can be carried out faster, more accurately, predictably and safely. Since the internet of things technology creates a virtual copy of the vehicles, fleet management is provided more easily and maintenance schedules can be planned automatically (Tike, 2015).



Radio Frequency Identification Technology is another contribution of the Logistics 4.0 concept to warehouse management. RFID technology is used to retrieve data from an object without the need for labour. In RFID technology, the information of the object with the RFID tag can be reported to the warehouse manager instantly via the internet infrastructure. The microprocessor in this label can store detailed data of the object such as production, order date, entry-exit information, storage information, production serial number and buyer-seller. Thanks to this technology, time-consuming tasks such as manual counting or barcode scanning are eliminated. Although this technology increases the service speed and quality of the system by reducing the error rate, it has a disadvantage due to the high technological initial investment cost (Maraşlı and Çıbuk 2015: 250; Yüksel and Zaim, 2009: 3).

It is now seen that Industry 4.0 and its technologies are used in many areas in the logistics sector. The explanations above are some of the main areas of use. In Figure 3, the history of the supply chain and the developments in the logistics sector with Logistics 4.0 are shown in more detail.

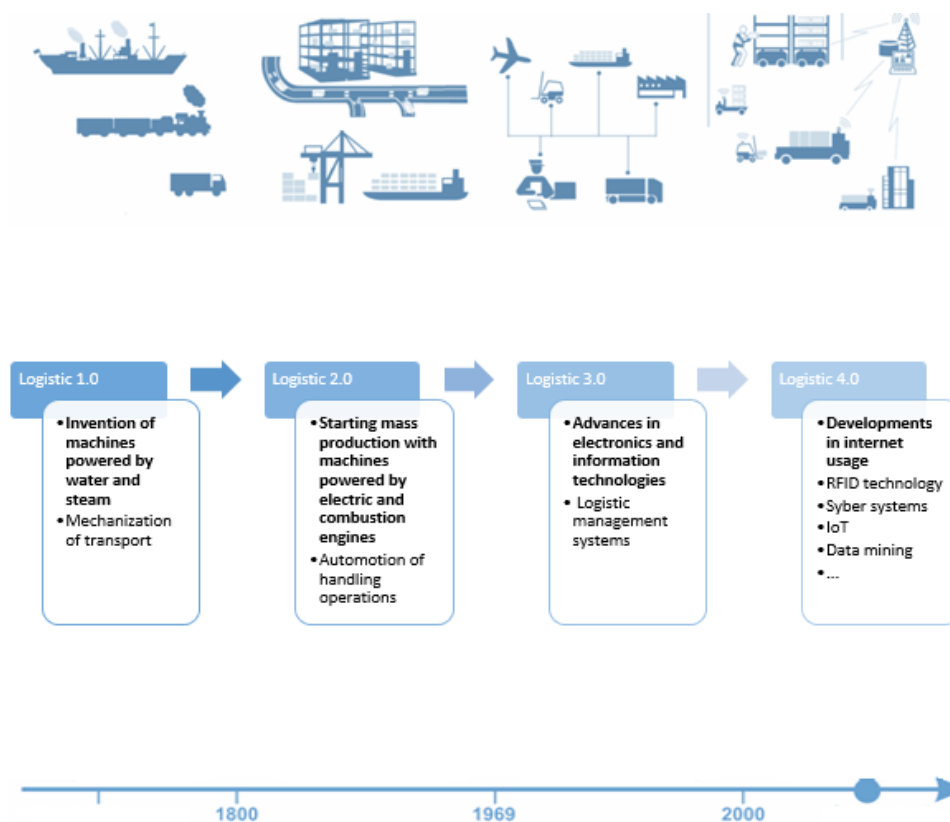


Figure 3. Evolution of Logistic  
Source: Yılmaz and Duman, 2019:192.

Considering the four industrial revolutions in the historical process, it is seen that each industrial revolution directly or indirectly affects the logistics sector. With Logistics 1.0, mechanization in transportation started. In Logistics 2.0, more automatic transportation systems such as automatic storage and sorting have started to take place. In the Logistics 3.0 period, computer and information technologies entered our lives and started to be used directly in the logistics sector. Finally, Logistics 4.0, which entered our lives with the fourth industrial

revolution, has begun to transform physical logistics processes into software-based applications. With this technology, an improvement has been observed in skills such as information processing, reporting, analysis and coordination, and all actors involved in the system have become more accessible to information about the process.

## **Operational Process Inside of Warehouse**

The internal functioning of the storage activities was generally explained at the beginning of the study. This section will focus on the details of the inner working principles. The purpose of schematically transferring the operational processes in the warehouse is that the second part of the study, the "Customs Warehouse Management Internal Operation" schematic, will be compared with the warehouse management schematic. For this reason, understanding this section will contribute to the understanding of the customs warehouse operation processes.

### **Warehouse Working Flow**

As the working principle, the warehouses follow such stages; taking orders, accepting products, preparing and shipping products. These processes can be done by following various ways, but the main stages of the process are as follows. These stages are receiving, transferring/placing, order picking/selecting, stocking/sorting, cross-storage, and shipping.

- In the receiving activity, the products are unloaded from the truck, and damage, quantity and quality control are performed. After the inspection processes, the inventory is updated and recorded. At this stage, the products are accepted into the warehouse.

- Transferring/placing/stocking includes the determination of the location where the product will wait until the shipment stage and its transfer to this location.

- Order picking/selecting activity refers to the process of receiving the product from the storage location after the order is received from the customer. This process can be seen as the most costly and time-consuming process in warehouse operations. Performance losses in this process cause dissatisfaction with the customer and increase in warehouse costs (De Koster et al., 2007:484). If order picking will be done in parts, it will be necessary to collect and sort the products. In this process, the products that are collected in parts are grouped according to customer orders and labelled on pallets after packaging. Products combined with pallets are transferred to the dispatch area. The order picking phase is the labour-intensive and costly phase of warehouse operations. If a general evaluation is made, approximately 55% of the total warehouse operating expenses are related to the order picking phase. For this reason, order picking represents the most important expense item of warehouse activities.

- During the shipping phase, the products coming to the dispatch area are loaded. At this stage, pallets are loaded on the vehicles and the vehicles are scheduled for shipment. In short, it can be said that a traditional warehouse process includes receiving, transferring, order picking, accumulating/classifying and ultimately shipping the product. It is also worth mentioning the cross-loading process, which is an alternative to the traditional warehouse process. Cross-loading includes only the receive and send

functions of the product. This process does not include the transfer, placement and order picking stages. Generally, the products received in the warehouse are shipped after a short waiting period.

### **Customs Warehouse Concept, Definition and Objectives**

Warehouse and warehousing activities are needed in international logistics and supply chain as in domestic logistics activities. Customs warehouses are defined as the open or closed areas that meet the conditions specified in the Customs Law and Regulations operating in bonded areas where the related goods are placed, stored and shipped during the customs clearance phase of the import, export and transit trade processes in international trade, where the special conditions and practices of the customs are valid. According to Article 93 of the Customs Law, "customs warehouses are the places that are established for the purpose of putting the goods under customs supervision and the conditions and qualifications to be sought in its establishment are determined by regulation." (Gümrük Kanunu, 1999: 93/3).

As briefly mentioned earlier, the most distinctive feature that distinguishes customs warehouses from warehouses are that the place where the goods to be exported, imported or subject to transit trade are stored is under customs supervision. For example, if the imported goods are placed in the customs warehouse, the customs surveillance on the goods continues until the goods are put into free circulation.

Customs warehouses also differ from warehouses in terms of their operation. While a commercial enterprise may determine an open or closed area as a warehouse within its own body, or operate an area that it has designated as a warehouse, or use this service from an external source, a business that wants to establish and operate a custom warehouse must do this within the framework of the Customs Law, Customs Regulation and other relevant legal regulations. An example of this legal regulation is to take the customs warehouse operation permit from the Undersecretariat of Customs if a commercial enterprise that wants to open and operate both general and private customs warehouses. On the other hand, there are no such prerequisites for opening a warehouse. While free market conditions come to the fore in the establishment and operation of the warehouse, the legislation is more decisive in the establishment and operation of the customs warehouse.

The purposes of establishment and operation of customs warehouses should be taken into account for the development of the national economy and the realization of the internal objectives of the enterprise. One of the economic purposes of the customs warehouses for the development of the national economy is to provide the supply-demand balance in exports and secondly to deliver the goods to the importer at the desired time. The non-economic purposes of the customs warehouses are to unload the goods from the transport vehicle within the bonded area, to store them, to transport the goods in the warehouse, to carry out the transportation process with the least damage and to load the goods on the transport vehicle (Bowersox, Smykay and Lalonde: 1996: 246-247). The internal purposes of the warehouses are to provide competitive service at minimum cost level and to provide protection and storage activities of the goods by providing the minimum storage cost without compromising the existing service understanding and quality.

## **Types of Customs Warehouses**

In our country, customs warehouses are structurally divided into two groups as expressed in the legislation. Accordingly, we can define customs warehouses as general customs warehouses and private customs warehouses in terms of establishment and operation. In the use of the customs warehouse, the person who operates the warehouse is called the operator and the person who uses the warehouse is called the user. In general terms, these concepts determine whether a customs warehouse is general or private. In short, it is seen that while the operator is one person and the user is more than one person in general customs warehouses, it is seen that the operator and user are a single person in private customs warehouses. In practice, types A, B and F are categorized as general, and types C, D and E as special. In this study, where we examine the effect of customs codes on the customs warehouse management model, general customs warehouses will be the focus of the study. In the theoretical work to be done, the readers' evaluation by considering the general customs warehouse structures will facilitate the understanding of the subject. The purpose of leaving private ones to the second plan and focusing on general ones is that the management and organizational structure are more complex in general customs warehouses, as many users use such types. We would like to state that the word "customs warehouse" to be used in the next parts of the study will refer to "general customs warehouse". A brief explanation of general and special types will be useful as a subject matter integrity.

### **General Customs Warehouse Types;**

In A-type warehouses, the operator is the only person, the user is more than one person. The operator is responsible to the customs for the goods placed in the warehouse and keeps the warehouse stock records.

In the B-type warehouses, the operator is the only person, the user is more than one person. The point where it differs from the A-type warehouses is that the operator has limited liability towards custom authority. According to the special case of Customs Law Article 97/1, the user is responsible for the goods placed in the warehouse. Stock records are kept on the declaration submitted by the user to the customs (Gümrük Kanunu, 1999: 97/1).

F-type warehouses are the general warehouse type operated by the Customs Administrations. While the operator is a public authority, the user can be more than one person.

### **Private Customs Warehouses Types;**

In the C-type warehouses, the operator and the user are the same person. The operator, and therefore the user, is responsible to the customs for the goods placed in the warehouse. The operator keeps the warehouse stock records.

In the D-type warehouses, the operator and the user are a same person. The point where it differs from the C-type warehouse is the implementation of Article 104 of the Customs Law. Accordingly, while the customs duties of the imported goods placed in the D-type warehouse, which are not in free circulation, are calculated and levied as soon as the goods enter the warehouse, the commitment process takes place when the user wants to take the goods into free circulation. It is a useful warehouse type so that importers are not affected by exchange rate fluctuations.

E-type warehouses are among the special type warehouses with special status. In this type of warehouses, whose user and operator are the same person, the storage place determined by the user and approved by the customs is considered as a warehouse. Although this storage place is not a customs warehouse, it is called a customs warehouse and the goods are processed according to the customs warehouse regime (Gümrük Kanunu, 1999: 93/4).

## **Customs Warehouse Operation Process**

Although warehouses and customs warehouses have similar operational processes in terms of general framework, they have differences in terms of procedure. The reason for this difference is that the operation type of customs warehouses is determined by the Customs Law and regulations, and therefore they have a different legal legislation than warehouses. As shown in Figure 1 at the beginning of our study, warehouse internal operation processes consist of certain stages such as receiving, storage, collection, packaging, consolidation and shipment, while the customs warehouse operation processes are summarized in Figure 4. By comparing the two figures, the points where the operation processes differ will be seen more clearly. Customs warehouse operation processes basically consist of the following stages;

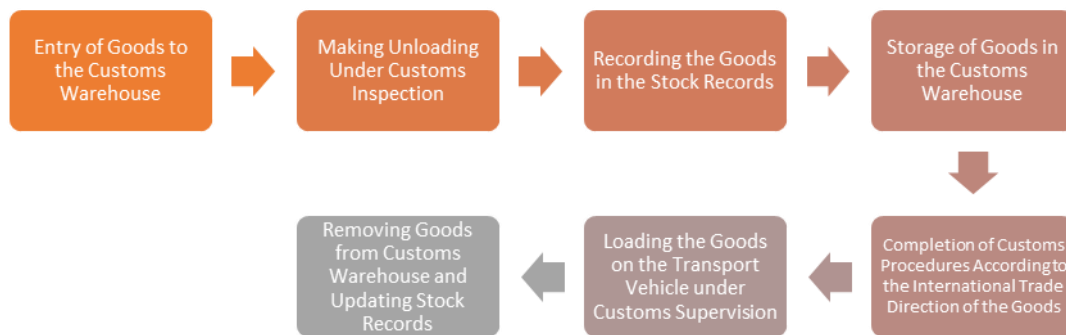


Figure 4. Customs Warehouse Operation Processes

In Figure 4, the customs warehouse operation processes are summarized. In this flow chart, it will be necessary to inform the customs authority in advance for the goods to be placed in the customs warehouse and to obtain permission with a petition. The goods arriving at the customs warehouse are unloaded from the vehicle under the supervision of the customs administration and stacked. Stock records of the goods entered into the customs warehouse according to the customs warehouse type are kept. Upon completion of the customs procedures according to the international commercial direction/status of the goods, the goods are taken out of the customs warehouse in part or in whole at the request of the buyer and loaded into the vehicle to which they will be shipped under the permission and supervision of the customs authority. The goods are deducted from the customs warehouse inventory records when the related goods leave the customs warehouse.

The working system of warehouses and customs warehouses also has differences in terms of the procedures applied for the entry of the related goods into the customs warehouse. While the goods shipped to the warehouse

should have a transport document and a delivery note at the warehouse entrance, although it differs according to the international commercial aspect of a goods that will enter the warehouse, documents such as Turkish invoice and packing list etc. in export-oriented transactions; English invoice, packing list, certificate of origin, circulation certificate and undertaking and related transport note in import-oriented transactions are needed at the customs warehouse entrance.

Another issue where warehouses and customs warehouses differ is related to internal operational functioning. In warehouses, after the goods enter the warehouse, they may experience in-warehouse operational processes such as back-up storage, cross-docking, picking and packaging, sorting, and merging. In addition, the exit of the goods from the warehouse is in line with the customer's request. In other words, the time to leave the warehouse can develop instantaneously, and in some cases, the goods entering the warehouse can be taken back to the dispatch area without entering the storage area. Therefore, this means that the work flow of the warehouse operation management and the actions it should take will change instantly. For this reason, although advanced warehouse management systems and software are used in most warehouses, it may not be possible to make a long-term plan according to the characteristics of the warehouse type. On the customs warehouse side, the situation is a little simpler and continues in a planned manner. The whole process, including the entry and exit of the goods to the customs warehouse, is managed in accordance with a certain legal legislation. Although the storage period of the goods is uncertain in customs warehouses like warehouses, predictability, sustainability and planning are more evident than warehouses. Operations such as order consolidation and handling that we encounter in warehouses are fewer common processes in customs warehouse management. In terms of international trade, consolidation and handling cannot be performed in cases where the goods are exported or imported, whereas in cases where there is only transit trade, consolidation and handling operations are carried out within certain legal regulations and their complexity and intensity are less compared to warehouse operation.

In short, warehouses and customs warehouses have different procedures within the framework of their commercial and legal dimensions. These procedural differences cause the operational processes of the storage activity to differ and different performance criteria and factors to be evaluated in both types.

### **Customs Warehouses Performance Criteria**

As in every commercial enterprise, customs warehouse operators also need to make performance evaluations in order to evaluate whether their commercial activities are effective or not. As a result of these evaluations, they have the opportunity to analyse the profit-loss status of the enterprises, to see the shortcomings of their enterprises or to identify the points where they are advantageous. We can think of these performance evaluations as S.W.O.T analysis. These performance evaluations can be cost-oriented (WFP-Warehouse Financial Performance), operational-oriented (Warehouse Cycle Time, DTT/S-Dock to Truck/Ship Time) or goods-oriented (goods damage rate in the warehouse) (Frazelle, 2002: 53- 55). In addition to the above-mentioned evaluation criteria, maximum performance use of the physical space of the customs warehouse, reduction of costs, stock level, time taken to store incoming goods and quick return to customers can also be seen as performance evaluation criteria (Harmon, 1993: 148). In addition, the timely preparation of the customer's order

(speed and timeless) is one of the topics that should be included in the performance evaluation criteria (Creed, 1990: 45).

To talk about the factors affecting the performance criteria mentioned above, the main factors affecting the administrative and operational functioning of customs warehouses are customs legislation, the location of the warehouse, the technical infrastructure, tools and equipment, automation and software used in the warehouse, the design and layout methodology of the warehouse. In addition, the following steps should be followed in the establishment and design of the customs warehouse; Pre-investment analysis, examination of Customs Law and regulations, site selection and planning, selection of vehicles and equipment to be used, and decisions for automation (Rouwenhors, Stockrahm and Mantel 2000: 515-533). These physical or non-physical factors directly or indirectly affect the warehouse performance. As can be seen in the literature studies and the explanations above, it is seen that many factors are effective in the development of customs warehouse and its management, and it is understood that studies have been carried out on this factor. In this study, the applications of the customs regime codes, which we think may have a direct impact on the administrative and operational management of the warehouse, will be focused on in the warehouse management model.

### **Custom Regimes and Custom Regime Codes**

Canitez (2021: 44) defines the concept of customs regime as the practices carried out by the customs authority in line with the rules, principles and regulations determined within the framework of the Customs Law and regulations regarding customs procedures. The activities that control the entry, exit or transit of a good into the Turkish Customs Borders can be expressed as customs procedures. Therefore, the customs authority is the structures that control whether the transactions of the goods are within the relevant customs regime at the border crossings. The customs authority carries out this inspection in line with the regulations specified in the Fourth Part of the Customs Law No. 4458. In case the related goods are found in the Customs Territory of Turkey contrary to these regulations, the procedure is carried out in accordance with the provisions of the Customs Law and/or the Smuggling Law. In short, the status of the goods that have entered the Turkish customs territory within the framework of international trade, must be within the scope of the relevant customs regime and be processed within the knowledge of the customs authority. The determination of the customs regime of the goods is made according to the eight regimes specified in the Customs Law. Customs Warehouse, Inward Processing, Processing Under Customs Control, Outward Processing and Temporary Import Regime are among the economically effective customs regimes. Export, Free Circulation and Transit Regime are among the customs regimes that are not economically effective. The Customs Warehouse Regime, which is the subject of our study, will be briefly mentioned in the next section.

### **Custom Warehouse Regime**

Customs warehouse regime is one of the regime types with economic effect. The customs warehouse regime regulates the provisions regarding the placing of the goods that are not in free circulation after being imported, and the provisions regarding the placing of the goods in free circulation in the warehouse in order to benefit



from the export measures (Öztürk, 2012:177). In addition, operations such as storage, handling and consolidation of goods subject to transit trade can also be carried out through custom warehouses. Although the customs warehouses are theoretically and practically within the political borders, since they are places that serve as warehouses that are accepted outside the customs borders, the imported goods taken into the warehouse are considered not to be in free circulation yet, and therefore, customs duties have not yet been committed for the goods stored in the warehouse. In this context, the customs warehouse regime is a tool with high economic added value, especially for economies such as our country, which supplies raw materials from abroad and exports as finished or semi-finished products. For example, importers using this structure in our country, put the imported goods in a customs warehouse and put them into free circulation as much as they need, and they are affected by the disadvantages of exchange rate differences as much as, and they also provide a financial advantage because they pay the taxes that they have to pay at once in proportion to the goods they take into free circulation. In addition, the imported goods waiting in the customs warehouse are taken into free circulation at any time, thus saving time for the users.

### **Custom Codes Used Custom Warehouse Regime**

Customs regime codes refer to the number sequences created to determine the customs regime types we mentioned in the previous sections. While it consists of numbers on the basis of regime codes, series of numbers are created by using these numbers to determine the type of customs regime. The 4-codes specified under the regime code in the 37<sup>th</sup>. place of the customs declaration expresses the customs regime code. The first two digits of the 4-codes indicate the nature of the desired transaction and the last two digits indicate the previous customs status of the goods. For example, the 4000 code is one of the customs regime codes frequently used in import transactions. If we read the regime code in reverse, “00” means "goods that have not been subjected to a regime before", which is the previous status of the goods, while “40” means "goods entering into domestic use simultaneously with free circulation without being subject to exemption", which is the nature of the transaction to be made. Therefore, the 4000 code, by definition, means "the simultaneous domestic use of goods that have not been subject to a regime before, without being subject to exemption".

Since the disclosure of all customs regime codes will cause the disintegration of the subject integrity, what the customs warehouse regime codes are and their explanations are considered sufficient. The regime codes and explanations used in the customs warehouse regime are shown in Table 1 below.

Table 1. Custom Regime Codes that are using Customs Warehouse Regime

<b>Regime Code</b>	<b>Explanations</b>
<b><u>Warehouse Regime Codes Used In Export-Oriented Transactions</u></b>	
1072	Exact export of goods in free circulation taken to the warehouse
2172	Temporary export of goods in free circulation taken to the warehouse within the scope of the outward processing regime
7121	Subjecting the temporarily exported goods under the outward processing regime to the

	customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration
7123	Subjecting the exported goods to be returned as they were exported to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration
7141	Subjecting the goods entered into domestic use simultaneously with free circulation within the scope of the inward processing regime reimbursement system to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration
7151	Subjecting the goods subject to the inward processing regime conditional exemption system to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration
7153	Subjecting the goods imported under the temporary importation regime to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration
7158	Subjecting the temporarily imported goods to the warehousing regime within the scope of the ATA Carnet
7200	Placing the goods in free circulation in the warehouse
7241	Within the scope of the inward processing regime reimbursement system, placing the goods in free circulation, which enter into domestic use simultaneously with free circulation, in the warehouse
<b><u>Warehouse Regime Codes Used In Import-Oriented Transactions</u></b>	
4071	The simultaneous domestic use of goods not in free circulation subject to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration, without being subject to exemption.
4072	Entry into the Customs Territory of Turkey for goods in free circulation subject to the warehouse regime
4171	The simultaneous domestic use of the goods not in free circulation subject to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration, within the scope of the inward processing regime reimbursement system.
4271	The simultaneous entry into free circulation and the simultaneous domestic use of goods not in free circulation subject to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration, subject to exemption.
5171	Subjecting the goods not in free circulation subject to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration, to the inward processing regime conditional exemption system
5271	Subjecting goods not in free circulation subject to customs warehousing regime, including

	places under customs control, to an inward processing procedure other than that specified in code 51
5371	Import under the temporary importation regime of goods not in free circulation subject to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration.
6771	Re-importation of goods returned to the country after temporary exportation and subject to the warehousing regime
7100	Subjecting goods that have not previously been subjected to a regime to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration
<b><u>Warehouse Regime Codes Used In Transit Trade (Changing of Warehouse)</u></b>	
7171	The goods subject to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration; to be placed in another place or warehouse under the control of the same customs administration or to be transferred by sale to another in the same warehouse
<b><u>Warehouse Regime Codes Used In Transit Trade</u></b>	
7191	Subjecting the goods subject to the processing procedure under customs control to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration
7272	Placing the goods in free circulation placed in the warehouse in another warehouse under the control of the same customs administration
3171	Re-export of goods not in free circulation subject to customs warehousing regime, including the places where the goods are allowed to be placed by the customs administration
7100	Subjecting goods that have not previously been subjected to a regime to the customs warehouse regime, including the places where the goods are allowed to be placed by the customs administration

Source: Gümrük Yönetmeliği, 2009: Ek-14.

It was mentioned that there are performance criteria and factors that affect the quality of the customs warehouse in order to develop the customs warehouse management and create a sustainable customs warehouse management model. It can be said that another factor affecting the customs warehouse management is the direction of the goods coming to the customs warehouse in terms of international trade. For this reason, the management of the goods operation process according to the customs warehouse regime code, which includes the goods arriving at the customs warehouse, is one of the factors that will contribute positively to the operation process. Table 1 shows the categorization of the direction of the goods arriving at the customs warehouse in terms of international trade. By making use of this table, a customs warehouse management model can be created.

## **Customs Warehouse Management According to Custom Regime Codes**

In the warehouse management model, a storage to be made according to the customs regime codes will provide benefits such as reducing the in-warehouse operation costs, saving in operation times and using the labour potential effectively. It is the order picking cost consisting of receiving, warehousing, order picking and shipping steps, which corresponds to more than 60% of the total of the 4 largest costs in the warehousing operation stages (Van den Berg and Zijm, 1999: 522). Therefore, reducing in-warehouse operation costs is an important criterion for warehouse operators. It is estimated that the unit cost per operation will be reduced by the grouping method according to the regime codes. In order to manage this process, the physical design of the warehouse should be divided into three as export, import and transit trade for the operations to be carried out according to the regime code of the goods. It is aimed to store the goods in the export storage area if the direction of the goods is export in terms of international trade, to store them in the import warehouse if they are import-oriented, and to store and handle the goods in the transit trade storage area, which includes transit trade provisions. In order for the goods classified according to the customs regime code to be properly stored in the relevant warehouse area, criteria such as the quantity and volume characteristics of the goods and the type of the goods must also be considered. For example, the storage and collection operations in the import warehouse area of 3 pallets of goods containing imported machinery spare parts taken into the warehouse under the free circulation regime and 1,000 tons of rebar taken into the warehouse under the free circulation entry regime will differ from each other.

### **Recommendations**

Warehouses and customs warehouses were seen as inert parts of the system in the past, in other words, as cost-creating elements. Today, it is understood that warehouses and customs warehouses are units that produce economic added value, and institutions and countries that realize the added value that this effect creates on the economy are starting to make a difference in trade.

Although it is seen that investments are made in the logistics sector, warehouses and customs warehouses in our country with the developing technology and infrastructure investments, it is seen that businesses, consumers and import-export companies face storage problems due to infrastructure deficiencies in some regions of our country. In order to develop trade and increase economic added value, the sustainability of warehouse and customs warehouse activities should be ensured by developing smart systems. Another factor in the development of both warehousing services and customs warehouse services is the trained and qualified manpower that can meet the needs of the sector.

When the previous academic studies are followed, it is seen that factors such as infrastructure, physical elements, technological innovations and human factor are emphasized for the development of customs warehouse activities. The fact that the warehouse management organization has not been examined in detail over the customs regime codes shows that there is a deficiency in this area. In future studies, it can be examined whether the customs warehouse regime codes are included in these elements and whether there is a correlation

on operational processes.

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