



World Scientific News

WSN 48 (2016) 63-68

EISSN 2392-2192

Logistics of warehousing

Judyta Kabus

Faculty of Management, Czestochowa University of Technology,
69 Dabrowskiego Str., 42-200 Czestochowa, Poland

E-mail address: judytakabus@interia.pl

ABSTRACT

The main purpose of the article is to carry out an analysis in the scope of a warehousing system, and a practical representation of a warehouse system. The article encompasses an attempt to analyze contemporary warehousing systems in connection with logistic systems adopted in enterprises, theoretical aspects pertaining to significance of warehouses in a logistic chain, representation of a warehousing system in an enterprise and its influence on the logistic processes in the company.

Keywords: logistic; warehouse system; enterprise; logistic processes

1. INTRODUCTION

A warehousing process poses a significant component of a basic logistic process, which covers activities in the scope of supplies management, or arrangement of inlet and outlet, in other words inflows and outflows, of goods in an enterprise. While looking from the perspective of pace of a logistic process and the level of logistic customer service, warehousing may be specified as adverse breaks in the flow of products of an enterprise, however in numerous cases, warehousing is a necessary condition for a proper course of the logistic process. Purpose of the article is to carry out an analysis in the scope of a warehousing system, and a practical representation of a warehouse system. The article encompasses an attempt to analyze contemporary warehousing systems in connection with

logistic systems adopted in enterprises, theoretical aspects pertaining to significance of warehouses in a logistic chain, representation of a warehousing system in an enterprise and its influence on the logistic processes in the company.

2. TASKS OF THE WAREHOUSING LOGISTICS

A significant role in the supply chain management system is played by transport and warehousing. Realization of those conditions is possible with specified actions, e.g. consolidation of smaller batches of loads into bigger ones, or realization of a direct delivery to a consumer, but also in relation to improvements of the warehousing systems and processes. One of the main tasks of a logistic chain management is to monitor the flows of supplied along the whole chain, and to limit those factors, which cause a suboptimal level of safety supplies or purchase of supplies to stock. A proper level of supplies should allow to reduce costs and outlays for supplies to a minimum level. A logistic chain has interconnected sides - a demand and a supply side. Both should be integrated within a single chain.

Practically, a warehouse is present in all components of the logistic chain, as its integral part, or as a storage facility for raw materials for production, or as a warehouse for finished products. It poses an important position both as a place for generation of costs, and as an element that build clients' trust to the product. A warehouse is an organizational and functional unit that stores material goods (supplies), which are out of use temporarily, having determined space devoted to that purposes, as well as technical means for transportation of supplies, their operation and stock. A warehouse poses a hub in a logistic network of dependencies, where goods are stored temporarily, or directed to another path leading through the network of interdependencies.

Functions played by a warehouse in a supply chain are divided into three groups. The first one is related to realization of actions and tasks in the warehousing process. It covers all actions pertaining to realization warehouse works (acceptance of goods, storage, release of supplies, preparation of documents, registering and recording stocks, revealing losses within the warehousing process). The warehouse management procedure encompasses acceptance, storage and release of supplies on the basis of material turnover documentation, protection of supplies (from thefts, destruction, damage), current maintenance of supplies with consideration of sensitive goods, records of materials and control of stock.

The second group of functions is related to warehouse management. It embraces planning, organizing, coordinating and controlling, which in relation to a warehouse cover planning of a warehouse operation and works realized on various time levels, organization and coordination of warehouse operations and processes (technical and human resource management), control over the warehouse operation (instructions, dispositions, documentation), and implementation of organizational authorizations.

The third group consists of auxiliary functions, i.e. registration of places, marking supplies, protecting supplies and warehouse buildings. The place of a warehouse in a supply chain influences its organization, equipment and planning of the warehouse work, but it is also significant for the problem of the warehouse location and its functions, e.g. products conditioning in a traditional warehouse adjacent to a facility, or in logistic centers, reducing the time of keeping the goods in the warehouse.

A warehouse plays a crucial role in the supply chain, as the goods transported from the manufacturer to the final recipient are stored at least once. It means that in case of an ineffective warehouse operation, the whole supply chain may be paralyzed, e.g. as a result of lack of goods, delays, jams. All logistic actions within the scope of a warehouse should prevent it from posing a bottleneck of the supply chain. It is conditioned by a proper design of a warehouse, also its further operation - in connection with other components of a logistic system. Parameters of particular warehouse zones should be defined and calculated precisely. Technologies of internal transport and storage, applied in the warehouse, should correspond to the specificity of operated goods.

In a logistic chain system, a warehouse is a decoupling point, where the main supplies of the chain are stored. There are five decoupling points, in which warehouses play specific roles. Location of warehouses can be different for various products in the same enterprise.

Table 1. Warehouses as decoupling points.

| Point type | Function |
|----------------------|--|
| Decoupling point I | A warehouse located near a market – a distribution warehouse |
| Decoupling point II | Finished products warehouse |
| Decoupling point III | A warehouse located before the production phase – a warehouse for parts and components |
| Decoupling point IV | Resources warehouse – a warehouse for raw materials and intermediate products |
| Decoupling point V | Supplier’s warehouse |

Source: Grzybowska K., *Gospodarka zapasami i magazynem. Część 2. Management magazynem*, Difin, Warszawa 2010, p. 16.

Each warehouse must be equipped properly, enabling storage of goods, their flows, provision of occupational health and safety and fire protections, as well as maintenance of a micro-climate, in order to guarantee adequate conditions for storing some products, especially food. Purpose of the installations for storage is to enable placement and segregation of goods. A group of these devices includes shelves, hangers, pads, storage bunkers and racks. A warehouse must be also equipped with transportation measures, which enable transport and handling of goods. There are also auxiliary devices which complement the warehousing process. They are comprised of devices for securing and controlling loads (e.g. in terms of weight), and appliances for identification of goods (e.g. bar codes readers) and communication between employees (e.g. short-wave radio).

3. PURPOSES AND SIGNIFICANCE OF WAREHOUSES IN AN ENTERPRISE

A warehouse is one of the elements of a logistic chain, which allows to maintain raw materials for production as well as finished products. At the beginning, the enterprises had a

negative attitude towards the necessity for warehousing, explaining that storing the products in a warehouse stops the flow of raw materials, which in turn increases the costs of production. Therefore, there was a plan of complete elimination of warehousing, and to deliver (and receive) the products in the just-in-time system.

However, contemporary enterprises look at this notion quite differently, coming to a conclusion that warehousing of supplies may increase the product value more than it increases its cost. In turn, too sizable supplies (especially in case of wholesalers and distributors) is not a good solution as well. An optimum solution is to store goods in warehouses only when the costs of this undertaking is compensated with advantages in other fields.

Enterprises should follow various standards related to warehousing and established by both national and European standardization committees, such as the European Committee for Standardization and the European Committee for Electrotechnical Standardization. Since 1 January 1994, application of Polish standards has been obligatory only if they are stipulated in acts, or the obligation for their application is implemented through a regulation issued by an adequate minister. The most significant standards in the scope of warehouse management are presented in the following table:

Table 2. The most significant standards related to warehousing

| Standard No. | Standard title |
|--------------------|--|
| PN-N-01800:1984 | Stock management - basic terminology |
| PN-B-01012:1981 | Warehouse buildings - Classification, Terms And Definitions |
| PN-M-78010:1968 | Internal transport - Ways and Bays - Guidelines For Design |
| PN-M-78320:1978 | Storage equipment - Shelves and Racks - Terms, Definitions, Classification and Symbols |
| PN-M-78321:1988 | Storage Free Standing Racks - Requirements And Tests |
| PN-EN 1525:1999 | Safety Of Industrial Trucks - Driverless Trucks And Their Systems. |
| PN-EN 1398:2000 | Dock Levellers - Division And Requirements |
| PN-EN ISO 445:2002 | Pallets for material handling - Vocabulary and Division |
| PN-ISI 2148:1998 | Continuous Handling Equipment - Nomenclature |
| PN-O-79021:1989 | Packages - System Of Dimensions |
| PN-B-02852:2001 | Fire Protection In Buildings - Calculation Of Fire Load And Relative Length Of Time Of Fire. |

Source: own work on the basis of Niemczyk A., *Zapasy i magazynowanie, Tom II Magazynowanie*, Podręcznik do kształcenia w zwodzie technik logistyk, Wydanie 2, Wydawnictwo Biblioteka Logistyka, Poznań 2008, pp. 141-143.

Purpose for creation of warehouses is also support to production processes, what can be achieved thanks to maintenance of necessary resources, materials and packages for production, allowing to preserve its continuity without any stops. Permanent access to packages gives an opportunity to receive finished products systematically and to deliver them to the recipient. It is worth noticing that warehouses support the marketing processes, what is achieved via permanent access to supplies, necessary for finalization of a promotional action or creation of promotional sets. Literature also presents other tasks of logistics, which are equally important as the objectives mentioned above. First of them is consolidation of transport conditions and their protection against unpredicted events. Consolidation of transport allows reduction of logistic costs, what is especially important in case of enterprises, which send goods on small distances. Therefore, a warehouse fulfills a task that consists in consolidation of smaller loads into bigger ones (e.g. full train cars).

Another task is conditioning of products, which meet customers' expectations. The customers, while submitting an order, often require differentiated goods in various quantities. While the enterprises manufacture their assortment in batches, often in delegated factories. In such a case, warehousing allows to reduce the time needed for goods flow, and enables effective realization of the order.

Another function is customer service, i.e. having adequate products in a given place and at a given time. It is also significant in case of supply warehouses, thanks to what it is easier to arrange a production schedule (while having proper supplies), what is reflected in quicker realization of an order. It is worth remembering that demand from customers is uncertain, and the costs of running out of stock are impossible to be measured by suppliers.

An important task of warehousing is protection from unexpected events, e.g. suppliers' running out of stock, delayed transport or a strike. Delays in delivery of raw materials may cause a stop in the production process, what is a disadvantageous phenomenon for an enterprise. A situation of unexpected events can also take place in distribution warehouses. The goods, which become damaged during transportation may influence the stock level and effectiveness of order realization significantly.

The last task of warehouses is to "smoothen" the goods flows, what is of special important in case of seasonal fluctuations. As suggested by authors of the book entitled *Zarządzanie logistyczne* (Logistic Management), "smoothening of flow will consist in avoidance of production in over-hours and at a low production level. A final effect of such a strategy of balancing will be reduction of company's investments in the manufacturing potential." An enterprise can improve a logistic system in a warehousing process thanks to IT systems, developed in 1950s.

4. CONCLUSIONS

Significance of logistics for a competitive position of enterprises is certain, and as a consequence, special significance in the functioning of logistic processes is ascribed to the warehousing process. Role of an appropriate course of the supply chain is highly significant from the perspective of the whole organization operations, because logistics effectiveness is also a subject of evaluation by the company's customers, who express their support or disagreement for the warehousing system, and in the broader scope - for the whole company and the level of its logistic process of customer service. A warehousing system is a crucial

element of companies' operations, and it poses a basic component for development of the customer service process in an enterprise. Role of a warehouse in the studies enterprise is crucial - warehouses are used to complement raw materials - taken from storage facilities - for production of finished products. When the finished products leave the manufacturing line, a warehouse is a place where orders are completed, and afterwards sent to the recipient.

References

- [1] Brdulak H., *Miejsce magazynu w przedsiębiorstwie*, Nowoczesny Magazyn, 3-4/2008.
- [2] Brzeziński M., *Logistyka w przedsiębiorstwie*, „Bellona”, Warszawa 2006.
- [3] Ciesielski M. (red.), *Instrumenty zarządzania logistycznego*, Wyd. PWE, Warszawa 2006.
- [4] Coyle J. J., Bardi E. J., Langley Jr. C. J., *Zarządzanie logistyczne*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2010.
- [5] Gołębska E., *Logistyka w gospodarce światowej*, C.H. Beck, Warszawa 2009.
- [6] Kozłowski R. (red.), *Podstawowe zagadnienia współczesnej logistyki*, Wolters Kluwer Polska, Kraków 2009.
- [7] Liwowski B., Kozłowski R., *Podstawowe zagadnienia zarządzania produkcją*, Oficyna Ekonomiczna, Kraków 2006.
- [8] Ładoński W., *Podstawy towaroznawstwa ogólnego*, Akademia Ekonomiczna, Wrocław 1994.
- [9] Majewski J., *Informatyka dla logistyki*, Biblioteka Logistyka, Poznań 2002.
- [10] Niemczyk A., *Zapasy i magazynowanie, Tom II Magazynowanie, Podręcznik do kształcenia w zwodzie technik logistyk, Wydanie 2*, Biblioteka Logistyka, Poznań 2008.
- [11] Niziński S., Żurek J., *Logistyka ogólna*, PWN, Warszawa 2011.
- [12] Weber J., Kummer S., *Logistikmanagement*, 2. Aufl., Schäffer-Poeschel Verlag, Stuttgart 1998.
- [13] Wieczerzycki W. (red.), *E-logistyka*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2012.
- [14] Witkowski J., *Zarządzanie łańcuchem dostaw*, Wyd. PWE, Warszawa 2003.
- [15] Wojciechowski Ł., Wojciechowski A., Kosmatka T., *Infrastruktura magazynowa i transportowa*, Wyd. Wyższa Szkoła Logistyki, Poznań 2009.

(Received 02 May 2016; accepted 18 May 2016)