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The Issues of Selection Warehouse Process Strategies

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Abstract

Paper presents problems of designing and organization logistic processes in warehouse facilities. Highlighted the need of improving logistics facilities actions as a key aspect of increasing productivity, flexibility and reliability of supply chains. For this purpose, warehouse process and the most common sub-processes and activities included in it were characterized. Additionally, it was noted that, warehouse processes may be implemented in many different ways and under various strategies. Selection of particular warehouse strategy usually depends on basic warehouse tasks, structure and size of customer orders, handled logistic units, costs of materials handling in particular sub-processes (both financial and time costs), availability of storage space and labour resources, etc. Therefore, probability of selecting the particular strategy is dependent on technical and organizational factors. Because of that, the paper presents some approach to selecting warehousing strategy. This approach takes into account mentioned technical and organizational factors. It also uses decision-making tree which shows probabilities of selection subsequent warehouse operations (in particular moment and warehouse situation) as well as probability of such situations as e.g. shipment suspending or cancelation in case of choosing a given strategy. Examples of such decision-making tree with probabilities of warehouse strategy selection is shown in paper.

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1. Introduction

Increasing globalization, development of world economies and growing consumerism of societies leads to increase demand for transport, movement and logistic handling of material goods. It causes creation of new as well as expansion and increasing complexity of existing logistics systems and supply chains. Consequently, they are expanded with new logistics facilities performing a wide range of logistics tasks. These tasks are aimed at efficient and effective transformation of materials in such way to satisfy customer needs (with rationalization of incurred costs at the same time). This in turn determines the necessity of solving a number of decision-making problems regarding the designing of efficient and effectively manage supply chains [7], [8].

The role of logistics facilities is a crucial for all supply chains, because they have significant contribution to handle materials which are moved from the places of production to consumers. Correct operation of warehouse facilities enables the realization of their logistic tasks at appropriate and acceptable by customers quality level. Consequently, it determines validity, cost-effectiveness and need of their functioning in supply chains. Therefore, a lot of attention in the literature is given to issues related to the design of storage facilities (see e.g. [1], [2], [4], [5], [6]) as well as modelling and organization of their warehouse processes (see e.g. [3], [9], [10], [11], [12]).

2. Warehouse process

Flow of materials through all kinds of logistics facilities is a strictly defined sequence of transformations performed on these materials. These transformations may involve transformations of time, place or form of handled materials. In the first case, it concerns buffering and storage of materials in logistic facilities. Place transformation is understood as a movement and transport of materials within warehouse. However, during the form transformation, materials are processed due to their physical form, i.e., co-packed, consolidated, unconsolidated, assembled, packaged, etc.

Warehouse process is a set of actions which are associated with receiving, storage, picking and shipping of material goods, in a suitably adapted places for this purpose, and under certain organizational and technological conditions. Therefore it can be concluded that warehouse process includes such sub-processes as receiving, storage, picking and shipping. Nevertheless, it is a very general approach, and warehouse process may take many different forms, and include multiple sub-components. Selection and appropriate connection of this process elements (sub-processes) is determined by functions and tasks of logistics facility. In fact, production warehouses, distribution warehouses or crossdocking warehouses usually perform variety kinds of transformations.

Each of these warehouse process components is characterized by an appropriate sequence of actions that have to be performed to complete a given goals and objectives (see Table 1). It is closely related to materials and information transformation by labour resources (labour resources include warehouse employees, transport means, warehouse equipment, tools for information flow management, etc.).

Table 1. The most common sub-processes and activities included in warehouse process [8].

Sub-process	Activity	Transformation
1	2	3
Receiving	Unloading	place
	Cargo identification and control	time
	Buffering	time
Put-away	Transport to storage area	place
	Placing unit loads in storage location	place
Storage	–	time
Replenishment	Transport to order picking area	place
	Transformation of unit loads to form offered in order picking	form
	Replenishment to pick locations	place

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