# DEVELOPMENT OF INVENTORY LOGISTICS

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**Annotation:** This article provides information on the reasons for the accumulation of reserves and reserves, technological and transition reserves, classification of material reserves, basic reserve control systems and production management.

**Keywords:** logistics of reserves, Insurance, Security, production without warehouses, reserves “on time”, restrictions, “buffer” reserves, material flow departments.

**Introduction**

Commodity and material reserves have always been a factor ensuring the safety of the logistics system, its flexible operation and were a kind of “insurance”. There are three types of basic systems [1-5]:

1) raw materials (including components and fuel materials);
2) goods at the production stage;
3) finished products.

Depending on their purpose, they are divided into the following categories:

- technological (transition) reserves that pass from one part of the logistics system to another;
- current (periodic) reserves created during the average production period or reserves of one batch;
- Reserve (insurance or "buffer");

they are sometimes referred to as” reserves to compensate for the random fluctuations in demand " (speculation reserves generated by the expected change in supply or demand for a particular product), for example due to labor conflicts, price increases or delayed demand, fall into this category of reserves.

**Research methods**

There are many reasons for creating basic systems in firms, but for them it is customary for the subjects of industrial activity to strive for economic security. The

uncertainty of the cost of creating commodity-material reserves and trade conditions does not lead to the importance of the valuable “security” Reserve network in the eyes of the company's management, since they objectively contradict the increase in production efficiency.

One of the strong incentives to accumulate reserves is the price of their negative level (deficit). If there is a shortage of reserves, there are three types of possible costs listed below to increase the negative impact:

1) costs associated with the failure to fulfill the order (delay in sending the ordered goods) - additional costs for the promotion and shipment of goods of orders that cannot be fulfilled due to the existing inventory;

2) costs associated with loss of sales-in the event that a regular customer associates this purchase with another company (such costs are measured in the amount of income lost due to non-fulfillment of a sales transaction);

3) costs associated with the loss of the customer - not only when the lack of inventory leads to the loss of a particular sales transaction, but also when the buyer is constantly looking for other sources of supply (such expenses are measured in the amount of total income that can be obtained from the implementation of all possible transactions of the company with the

The first two types of costs are undoubtedly called “the time costs of the company as a result of the adoption of an alternative course.”

It is difficult to calculate the costs of the third type, since the assumed customers are different, and the corresponding costs too. However, it is very important for the company that the assessment of this type of cost is as close as possible to the amount of costs that may actually occur.The cost of inventory shortages is more than the cost of lost trading transactions or unfulfilled orders. This includes the loss of time for the production of products, the loss of working time and, possibly, the loss of time due to costly breaks in production during the transition between complex technological processes.

Technological and transition reserves.

At any time in the logistics system there are certain reserves that pass from one part of this system to another. In the case of logistics, it takes a lot of time to transfer reserves from one level to another, the volume of reserves in the transition period will be large. With long-term fulfillment of orders (for example, in the time interval between the production of products and arrival at the warehouse in finished form), the total number of technological reserves will be relatively large.

At the moment when the goods leave the warehouse and at the time interval received by the customer, a large amount of passage reserves accumulates in a large period of time. For example, the average level of demand for this product is 200 products per week, and the total transition period of this product with a delivery period

to the buyer for two weeks is an average of 400 products.

To calculate (calculate )the average number of technological or transitional periodic reserves in a logistics system, the following formula is used [6-8]:

$J = ST$,

J-total volume of technological or transition period (located)

transportation process) inventory;

S - the average sales rate of these reserves for a given period of time;

T is the average transport time.

Reserves of one batch or cyclic reserves. A feature of most business systems is that goods are ordered in excessive quantities in relation to the required volume at the moment. There are a number of reasons for this, such as:

1) delay in the full receipt of ordered goods, which forces buyers (especially intermediaries) to keep certain goods in the warehouse for a while;

2) discounts offered when buyers sell large quantities of goods;

3) taxation of trade transactions in the minimum amount, which leads to the shipment of goods in the amount less than the specified amount to the customer, damage, etc.

There are certain restrictions on the volume of commodity and material reserves. Limiters are the costs of their maintenance. Therefore, on the one hand, it is necessary to order the storage of goods, and on the other hand, to maintain a balance between advantages and disadvantages. This balance is achieved by choosing the optimal size of the ordered goods or by determining the order size (EO - economic order quantity), calculate it by the following formula [9-12]:

$$EOQ = \frac{2AD}{vr},$$

A-cost of production;

D-average level of demand;

v-unit costs of production;

r-storage costs.

Reserve or" buffer "reserves serve as a kind of" emergency " source of supply in cases where the demand for this product is higher than expected. In practice, the demand for goods can be accurately predicted in very rare cases. The same applies to the correctness of determining the timing of the execution of orders in advance. For this reason, the need to create reserve reserves arises.

To a certain extent, the services provided by a particular company act as its reserves, and vice versa: the company's reserves are a function of its services. It is clear that the company will try to minimize the level of its reserves in accordance with the customer service strategy, and here again there will be a need for a compromise - this time it will depend on the difference between the costs of maintaining its reserves,

designed to adapt to unexpected changes in demand, and the benefits received by the company Determining the exact level of necessary reserves depends on three factors, namely [13-15]:

1) possible fluctuations in the recovery time of the amount of reserves;

2) change in demand for related goods during the order period;

3) customer service strategy implemented by this company.

Increase efficiency.

In recent years, there has been a significant improvement in production methods, which has reduced production costs. Additional savings can be achieved if existing reserves are made in the rationalization of production assurance processes.

The priority in relation to one or another product often changes, since the demand for it and its value do not remain constant. This means that the distribution of the value of units of commodity accounting is not a dynamic, but a dynamic concept.Due to a number of factors, including the activation of the logistics system, many modern enterprises are inextricably linked, and the production and inventory system is becoming interconnected. In such a situation, production management means not only each link, but also the organization of work at the same time as a whole. Analyzing the system of orders for production, many firms began with a complex method of regulation, which allows you to harmoniously connect all the joints and measure the volume and reserves of production [16-19].

All other manufacturing and supply units receive orders directly from the next link near the end of the supply chain. For example, the finished goods warehouse orders the assembly shop to produce a certain number of products (equivalent to submitting a production order), the assembly shop orders the processing shops and the cooperative department to produce sub-lots, etc. (1- picture).

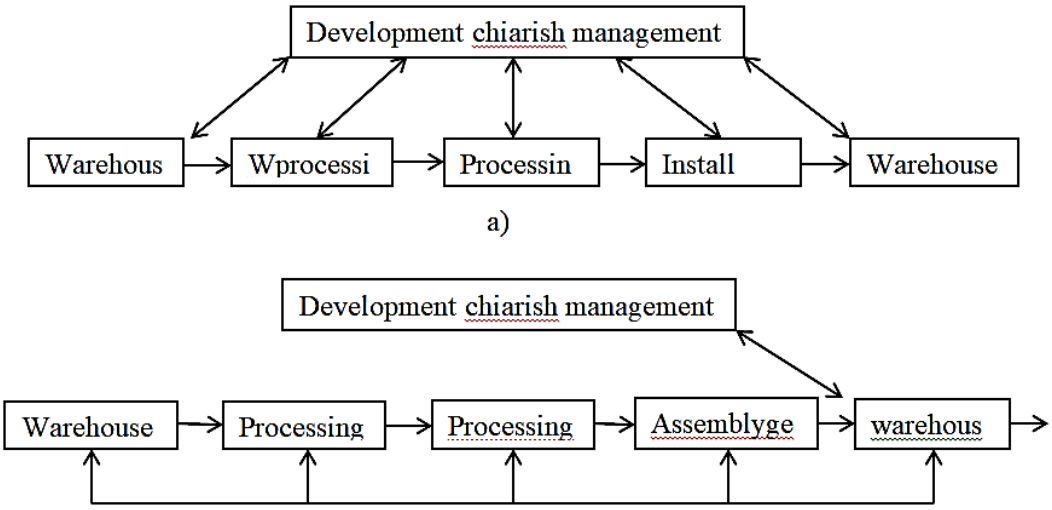


**Figure 1. Production management:**

a-in the traditional system; b-in the" on time " system

The production task is always assigned to the equipment using (or processing) this

part. Thus, the flow of material from the" source "to the" consumer "is provided with" only on time "information before the flow of Information directed in the opposite direction, that is, before the production of" on time" [20-24].

**Backup lagging article solution**

Practice shows that in order to effectively implement a" timely " strategy, it is necessary to change the way of thinking of the entire team involved in production and marketing. The traditional stereotype of thinking, for example, that the "the more, the better" scheme should be replaced by the "less, the better" scheme when it comes to inventory level, production capacity, production cycle time, or product volume.

Taking as an example the concept of "on time" at Western European enterprises, we can say that the average data obtained on sites with more than 100 surveys (individual projects are constantly working in firms for 2 to 5 years):

• non-employment reserves decreased by 80% ;

• stocks of finished products decreased by almost 33;

• volume of non-production reserves (mate)

In the conditions of increased competition between measures by which it is possible to rationalize production and improve its technology, it is necessary to reduce the duration of the production cycle and the time of storage of stocks in workshops and warehouses. Currently, production management systems do not always meet market requirements. Their main disadvantages:

• excessively large deviations of planning from the real state, despite the high costs for electronic data processing and the system as a whole;

* lack of opportunities to effectively influence productivity, the duration of the production cycle and the required level of reserves;

Lack of freedom of action of planning structures and employees associated with planning. Foreign experiments show that in industrialized countries, the effective part processing time is 20% of the production cycle. This indicates that production has been found in a semi-finished form for a very long time and leads to the emergence of large reserves and, accordingly, to an increase in their cost. Studies conducted in a number of Western countries confirm that the expected income from each percentage decrease in the inventory level can be equated to a 10% increase in turnover [25-29].

An interesting solution to the problems of warehousing is "production without a warehouse", which is impossible without making fundamental changes in all processes that ensure its production and carry out production itself, and requires significant financial costs. At the same time, as it turned out, it was necessary to solve several problems, among which, first of all, there was the task of creating a high-precision data storage system that allows you to use a data bank in real time.

When using this system, products are produced only in a volume that provides sales. Raw materials and materials are purchased only in the amount necessary to meet

the demand. In this regard, supply logistics is not abstract from what happens in the final stages of production. On top of that, the main factor is to know about the state of the market and the conditions under which it can be accessed.

The logistic approach to the management of basic systems involves the abandonment of a functionally oriented concept in this area, since it has the following disadvantages [30-35]:

• problems with the creation and storage of reserves are often solved on the principle of finding the culprit in another structure instead of identifying the true causes;

• the functional relationships of each organizational structure develop their own individual fund policy, which is not always agreed upon at a high level of the organization;

• production is usually provided with surplus reserves.

Thus, if the individual functions of the organizational structure are not developed in a holistic way, the problem of reserves cannot be solved. The requirement to optimize basic systems led to the need to develop a unified concept of liability for commodity stocks.

**Conclusion**

In short," production without a warehouse " is a system that makes fundamental changes in all processes that ensure production and carry out production itself, and requires significant financial costs. At the same time, it turned out that several problems were required to solve, among which, first of all, include the task of using a data bank in real time and creating a high-precision data storage system that allows.

Currently, market requirements for product parameters and, above all, requirements for their quality have increased significantly. This includes the advantage of demand over supply, the presence of excess production capacity. Success in this competition can be achieved by a person who has built his economic indicators in the most rational way to produce at an acceptable level.

This goal is achieved, among other measures, through [36-39]:

* reduce costs associated with the creation and maintenance of reserves;
* reduce delivery time;
* better adherence to delivery time;
* increase the flexibility of production, its adaptability to market conditions;
* improve product quality;

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