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INVENTORY VALUATION IN BUSINESS ENVIRONMENT

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ABSTRACT

Stock is to keep the right material at the right amount, at the right time, in the right place and at the minimum cost. For good inventory management, businesses need to properly configure, transport and manage material management functions within the inventory system. Since purchasing, warehousing, distribution and inventory control within these functions are directly related to each other, the slightest error in these processes can turn an effective management into a system out of control. The main purpose of stock controls is to realize customer needs with the lowest possible cost and lowest investment, to avoid unnecessary investments in stocks. Detecting a suitable stock level will prevent a large portion of the capital from being left idle, as excess investment in stocks will reduce profitability of businesses. Therefore, the control and management of stocks are considered to be important factors affecting the overall problem and financial performance of all enterprises.

Key words: ınventory, business, valuation

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INTRODUCTION

Today, enterprises have had to enter a significant change process in the face of technological developments and increasing competition. In addition, in today's conditions, businesses need to keep control of not only their internal activities, but also their purchasing activities so that they can maintain their competitive advantage and market position. In this context, stock management processes have a big precaution in terms of minimizing the production costs in particular. In addition, working with minimum inventory that will reduce costs will be a great advantage as it will increase the financing performance of the operator and will also lead to cost advantages in the face of such business competitions. This not only gives the business a competitive advantage but it also allows the business financing resources, which are generally limited, to be shifted to other areas, further increasing the competitiveness of the business.

It is not enough alone for businesses operating in today's tough competition environment to take simple budgeting measures so they can overcome the financial strains they face. Therefore, every element in the organization needs to be rationally managed to solve the problems. The most important of these elements are human resources and stocks.

Stock is to keep the right material at the right amount, at the right time, in the right place and at the minimum cost. For good inventory management, businesses need to properly configure, transport and manage material management functions within the inventory system. Since purchasing, warehousing, distribution and inventory control within these functions are directly related to each other, the slightest error in these processes can turn an effective management into a system out of control.

Having an excess stock of the business reduces the risk of not having it and reduces the ordering cost even though it causes more

money to be deposited in stocks per unit. The decrease in stocks will increase the frequency of placing orders because the unit will decrease the amount of capital invested but increase the risk of stalking.

Both of these situations are considered as a negative situation as they increase the costs of the operator. As you can see, order quantities and order timing decisions need to balance costs and minimize costs arising from overstocking and low inventory.

The main purpose of stock controls is to realize customer needs with the lowest possible cost and lowest investment, to avoid unnecessary investments in stocks. Detecting a suitable stock level will prevent a large portion of the capital from being left idle, as excess investment in stocks will reduce profitability of businesses. Therefore, the control and management of stocks are considered to be important factors affecting the overall problem and financial performance of all enterprises.

However, inadequate investments in stocks may cause some problems in terms of business management and may lead to problems that may hinder the continuity of business operations. In order for the enterprises to carry out a successful stock control, it is necessary to start from the raw material used during the entry stage of the production process, to the stage of receipt of the outputs after the production process

Keeping all semi-finished and finished materials used in processes in appropriate quantities in stocks, monitoring and production can be continued without interruption it is necessary not to stock excessively. The availability of this stock in stocks ensures a good stock that meets operating conditions and economic conditions. Control and decision-making process.

In the study, firstly inventory control methods, deterministic and stochastic stock control (R, S) inventory control model, where the

application was judged to meet the needs of the cement plant in which the application was made. Later, the (R, S) stochastic stock, which is designed with the raw material stock control cost of the factory using conventional methods he cost of raw material stocks is compared.

CHAPTER I:
INVENTORIES IN THE SYSTEM OF RESOURCE SUPPORT FOR INDUSTRIAL AND ECONOMIC ACTIVITIES OF INDUSTRIAL ENTERPRISES

1.1. The role and importance of inventories in improving the efficiency of industrial and commercial activities of an enterprise

The term "commerce" in translation from the Latin commercial means trade, trade operations, trade. This was the reason for the appearance of merchants, persons engaged in commercial activities, as well as terms such as commercial risk, trade secrets, commercial secrets, commercial loans, commercial banks.

Commerce - "bargaining, trade turnover, merchant handicrafts" according to the definition of the explanatory dictionary VI. Dahl.

Commercial activity - commodity-money exchange, in the course of which the goods from the supplier are transferred to the ownership of a trading enterprise with an orientation to the needs of market demand.

Commercial activity - operational and organizational activities for the implementation of commodity exchange transactions in order to meet the needs of the population and profit (Balakrishnan, Pangburn and Stavrulaki, 2005: 1).

Commercial activity is a complex operational and organizational system aimed at ensuring the fulfillment of the purchase and sale processes, taking into account current and future market changes, in order to fully satisfy the demand of the population and make a profit. This is an activity that allows all participants of the commercial turnover

to successfully interact with the mutual benefit at all stages of the implementation of trade transactions.

The term "bargaining, trade turnover" means commerce from the point of view of the profitability of buying and selling, accompanied by a commercial transaction, exchange and promotion of goods. In this case, the universal medium of exchange is money, and the place of exchange of commodities for money is the market. The manufacturer makes the goods and sells it to the trading company at a certain price. In turn, the trading company sells this product to the buyer at a price regulated by the market.

Commercial activity is a special kind of activity related to the sale of goods on which the final results of a trading enterprise depend. The main participants of commercial activity are not only entrepreneurial structures, but also consumers. This statement is based on the fact that for entrepreneurs the most important factor in concluding transactions is income (economic benefit), and for consumers, the product (service) that is necessary to it is the most beneficial if it more satisfies its needs (consumer interests). While doing business, you should remember the following conditions for its implementation.

Terms of Business (Jan and Kulkov, 2008: 24):

1. Presence of two or more parties when executing a trade transaction.

2. Each party must have something that is of value to the other party.

3. Each party should be able to communicate and deliver goods.

4. Each party must be absolutely free in accepting the offer of the other party.

5. Each party should be sure of the expediency or desirability of dealing with the other party.

Commercial activity integrates the following areas:

• Planning of procurement volumes and organization; the intermediary is important to determine what to buy, from whom, in what quantity, at what price and at what time;

• organization of resale of the purchased goods taking into account the planned volume of profit;

• search and selection of the best partner among suppliers and buyers for a bargain;

• organization and implementation of the process of trade and commodity circulation, taking into account the elements of efficiency;

• Determination of optimal procurement prices and sale prices, corresponding to the quality of the product, its competitiveness, the situation on the market;

• forecasting and operative accounting of market changes, and active use of aggregate factors affecting the maximum satisfaction of customers' requests and receiving income taking into account the interests of partners;

• implementation of a wide range of services for the preparation of market information, the organization of services for the final consumption of goods, as well as the use of vehicles, financial, insurance and numerous other operations in the commodity circulation system.

Consumers in modern conditions are not passive buyers, but full participants in commercial activities, its regulators. Thus, the consumer (Fig. 1) is the most important subject of business relations between the suppliers of goods and the retail link (Wang, Yin and Mac, 2013: 9).

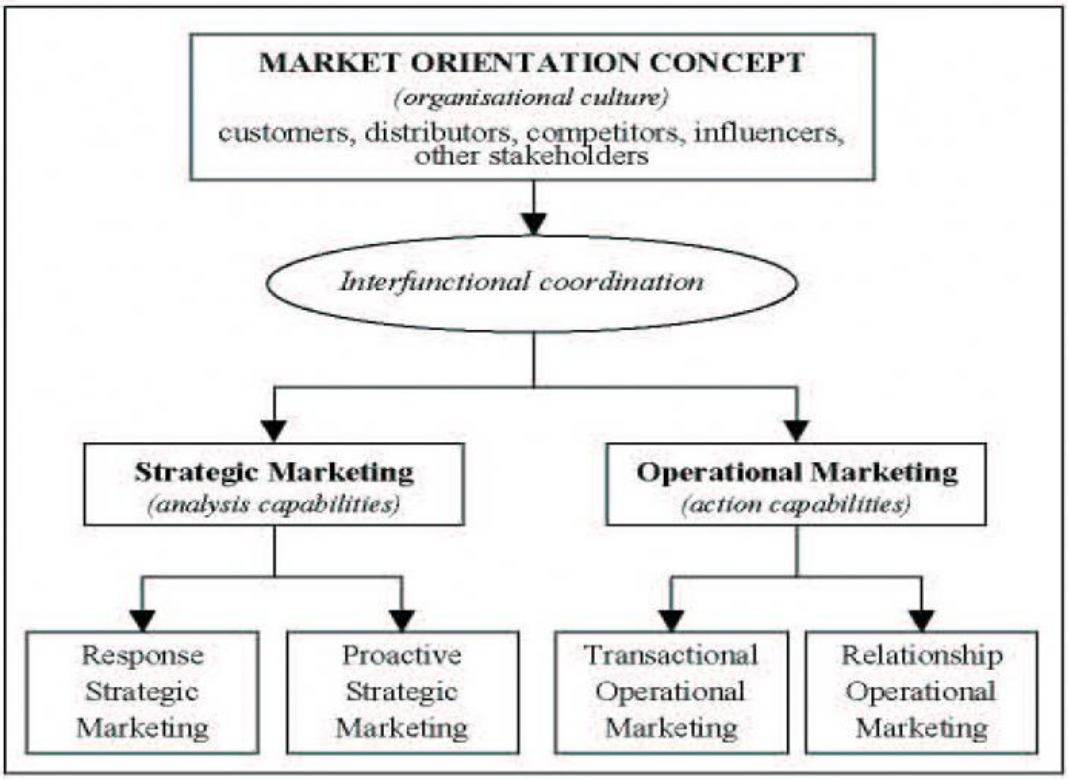
Attentive attitude to the proposals and remarks of customers is the primary goal of any trading enterprise, the prerequisite for attracting additional customers, and this process is accompanied by distraction of

customers from competitors, strengthening the company's image, increasing sales, increasing profits.

That is why the complex of tasks of commercial activity of the subjects of the consumer market is considered through the satisfaction of the needs of the population. The consumer, realizing his interests, has a decisive influence on the behavior of entrepreneurs in the market when making deals, choosing a market segment, organizing the sale of goods, forming an assortment, price policy.

When researching and solving commercial problems, these concepts are used and used in interaction with each other, taking into account the dynamics of processes and the speed of their flow.

Fig 1. Complex of tasks of commercial activity in the market of goods and services



Source: The commercia Wang, X. (2010). Inventory Management in a Pharmaceutical Company: Minimizing the Practice of Failure, National University of Singapore, Singapore, July 12, 2014.

activity of organizations and enterprises covers the issues of studying the demand of the population and the market for the sale of goods, identifying and studying the sources of goods receipt, organizing rational economic ties with suppliers, including the development and submission of orders and orders for goods, the conclusion of contracts for the supply of goods, the organization of accounting and control for the fulfillment by suppliers of contractual obligations.

Among the main objectives of commercial activities include (Khasin and Meggido, 2001: 16):

1) the formation of commercial policy. Under commercial policy is understood the necessary composition of current and prospective tasks of commercial activity, the choice of ways to solve them. It is determined by the economy

commodity market, the goals of the trading company, its real capabilities, the search for alternative options for commercial activities. Among the main components of the commercial policy of the enterprise can be attributed: the development of the zone of own influence in the market, the identification and filling of new market niches, assortment policy, strengthening the competitiveness of the enterprise, increasing the level of commercial services.

2) an integrated approach to commercial work. It implies a close relationship of the enterprise with suppliers, purchase and sale of goods depending on the structure of market demand, management of the promotion of goods to the buyer. The effectiveness of commercial activities depends on a comprehensive analysis of the factors of the internal and external environment.

3) managing the purchase and sale of goods on a commercial basis, with the use of marketing tools.

4) development of target markets. The study of the state of the market expresses the motivations of buyers, solvent demand, the prerequisites for its growth, the relationship between supply and demand. This allows us to determine the potential for the development of specific markets or their segments.

5) adaptation of commerce to environmental changes.

6) maintenance of the account of costs connected with commercial activity. Commercial success is determined by the mutually beneficial nature of transactions, entrepreneurship, trade-offs and competencies of the merchant.

Commercial activities can be divided into several stages (Singhal, 2005):

1 - study of demand and determination of requirements for goods;

2 - identification of suppliers of goods and establishment of economic ties with them;

3 - organization of wholesale (retail) purchase of consumer goods;

4 - commercial activities for the wholesale sale of goods;

5 - commercial activities for the retail sale of goods;

6 - formation of assortment and management of commodity stocks;

7 - advertising and information activities;

8 - provision of trade services.

At each of the listed stages, certain commercial transactions are carried out. At the same time, it should be borne in mind that the content of operations may differ depending on the stage at which the goods are trafficked.

The aggregate of goods and services forms the consumer market. The basis of commercial activity is capital, material and technical and information and computer support, functions - commercial and commercial transactions, contractual obligations, commodity-money exchange, commercial processes associated with bringing the goods to the target markets.

The main subjects of the sphere of commodity circulation are (Shim and Siegel, 2008: 10):

the state - the government, state bodies that produce and sell goods, securities that provide services and acquire labor, goods, securities;

enterprises and entrepreneurs - firms, companies, organizations, enterprises of different forms of ownership, legal entities and individuals that supply, sell and purchase a wide variety of goods that provide services,

households - citizens who sell their labor, own goods and services, and buy goods and services necessary for life.

Market subjects directly interacting with trading enterprises are producers (suppliers) of goods, commercial organizations, intermediaries, transport enterprises, consumers.

To ensure the normal functioning of the consumer market, the existence of enterprises and services that mediate commercial transactions is necessary.

By the nature of the functions performed, trading processes can be divided into two types: technological (production) and commercial (trade). Technological processes are associated with the movement of goods as a consumer value and continue the process of production in the sphere of circulation (transportation, storage, packaging, packing, sorting). Commercial processes are associated with a change in forms of

value, i.e. with the purchase and sale of goods. Commercial processes also include such trading processes that ensure the normal performance of operations for the sale of goods: the study of consumer demand, organization economic relations between the supplier and consumer of goods, wholesale purchases and sales of goods, etc.

1.2. Classification of inventories in the enterprise

Depending on their purpose, the reserves are divided into the following categories (Roumiantsev and Netessine, 2005):

- technological (transitional) reserves moving from one part of the logistic system to another;

current (cyclical) reserves created during the average production period, or stocks with the volume of one batch of goods;

reserve (insurance, or "buffer") sometimes they are called "stocks to compensate for random fluctuations in demand" (this category of reserves also includes stocks created in the event of expected changes in demand or supply for a product, for example, in connection with labor conflicts , raising prices or deferred demand).

Thus, there are many reasons for creating inventories in the enterprise, but the main is the desire of the subjects of production activities to economic security. At the same time, the cost of creating inventories and the uncertainty of the terms of sale objectively contradict the requirement to increase production efficiency.

One of the incentives to create stocks is the cost of their negative level (deficit). In the presence of a shortage of stocks, there are three types of possible costs listed below in order of increasing their negative impact (Rajeev, 2010: 5):

costs due to non-fulfillment of the order (delay with the dispatch of the ordered goods), i.e., additional costs for the promotion and

dispatch of goods of that order, which can not be performed at the expense of available inventory;

costs associated with loss of sales in cases where a permanent customer applies for a purchase in some other firm (such costs are measured in terms of revenue lost due to non-execution of a trade transaction);

costs in connection with the loss of the customer in cases when the lack of stocks results not only in the loss of a particular trade transaction, but also in the fact that the customer starts looking for other sources of supply (such costs are measured in terms of total revenue that could be obtained from the sale of all potential customer transactions).

The cost of a stock deficit is greater than the price of missed trade deals or unrealized orders. It includes the loss of time for manufacturing products, and the loss of working time, and the loss of time due to costly interruptions in production in the transition between complex technological processes.

Technological and transitional reserves. At any time in the logistics system, there are usually certain reserves moving from one part of this system to another. In those cases of logistics, when the transfer of stocks from one level to another takes a long time, the volume of transitional stocks will be large. With long terms for the realization of orders (for example, for large periods of time between the manufacture of a product and its arrival in finished form to a warehouse), the total amount of technological stocks will be comparatively large. Similarly, for large time intervals between the time of the release of goods from the warehouse and the moment of its receipt, the customer will accumulate a significant amount of transitional stocks (Rajagopalan and Malhotra, 2001:6).

Example. With an average level of demand for a given product equal to 200 articles per week, and the delivery time for a customer equal to two weeks, the total amount of transitional stocks of this product will average 400 items.

To calculate (estimate) the average amount of technological or transitional inventory in this logistics system in general, the following formula is used (Balakrishnan, Pangburn and Stavrulaki, 2005: 3):

$J = N \bullet T,$

where J is the total volume of technological or transitional (in the process of transportation) inventory;

N - the average rate of sales of these stocks for a particular period of time;

T is the average transportation time.

Stocks with a volume of one batch of goods, or cyclical stocks. In most cases, the goods are ordered in quantities that are redundant in relation to the quantities currently required for the following reasons:

delay in obtaining the ordered goods in full, which forces customers (especially intermediaries) to store certain goods for a while in the warehouse;

discounts provided to customers when they sell goods in large quantities;

taxation of trade transactions with a minimum lot size, making it unprofitable to send goods to the customer in quantities less than the established size.

In this case, there are certain restrictions on the size of inventory. Limitations are the costs of their storage. There is a need to achieve a balance between the advantages and disadvantages of the processes of ordering and storing goods.

This balance is achieved by choosing the optimal volume of batches of ordered goods, or by determining the economic (optimal) order size (EOQ), which is calculated by formula

EOQ = 2CD / VP

where C is the cost of production;

D - average level of demand;

V - unit costs of production;

P - storage costs.

Reserve, or "buffer", inventories serve as a kind of "emergency" supply source in those cases when the demand for this product exceeds expectations.

In practice, the demand for goods can be accurately predicted extremely rarely. The same applies to the accuracy of predicting the timing of the implementation of orders, what caused the need for the creation of reserve inventory.

So, a very common criterion for classification of inventory is the level of demand for them. He assumes the attribution of certain stocks to these categories (Panigrahi, 2013:3):

goods of regular demand (those for which stable demand persists throughout the year);

seasonal goods (those that are characterized, respectively, by seasonal demand);

goods of rare demand (those that can be sold several times a year).

It can be noted that these categories of inventory can not always be unambiguously characterized by cost (which would, for example, predetermine the intensity of demand for them). So, commodity-material stocks in the form of goods of rare demand can be as affordable products

- for example, books in Japanese, and almost inaccessible to ordinary citizens - for example, airplanes, supercomputers.

Another criterion for the classification of matrices is their location. So, inventories can be (Chambers and Lacey, 2011):

in the warehouse;

in the production shop;

on my way;

at the stage of shipment, loading;

on responsible storage.

Between the indicated locations of commodity-material stocks there can be various intermediate stages of realization of those or other economic operations with stocks.

A common basis for the classification of inventory is the criteria for their standardization. So, the norms for the relevant stocks can be established:

in days (when the period during which the goods must be present in the warehouse is determined);

in the monetary dimension (when the revenue is determined for the purchase of goods present in the warehouse);

in physical terms - in pieces.

Classification by unit of account: what is the inventory reflected in?

Another common method of classifying inventories is to select the units of accounting for the respective stocks. These units can be represented, in particular:

nomenclature numbers;

parties;

groups of homogeneous products.

Based on the appropriate criterion, inventory can have, conditionally:

high turnover (in this case it is supposed to provide their larger volume in the warehouse):

average turnover (they can be placed in a warehouse in a smaller volume);

low turnover (they can be placed in the warehouse in a minimal amount).

Of course, this is not an exhaustive list of criteria for the classification of inventory. We reviewed the most popular ones.

Inventories as one of the key assets of a firm can be classified for various reasons. This classification can be carried out, first of all, in order to optimize their accounting.

1.3. Formation of a system of indicators for estimating inventories

Valuation techniques are a method of accounting that relates to the monetary dimension and the valuation of stocks.

In the customs of world accounting, incoming inventories (including goods) are valued at historical cost, in Russian - at the actual procurement cost, which reflects the actual costs of the organization to purchase them.

The actual procurement cost consists of the amounts paid to the supplier and the transportation and procurement costs (Brigham and Daves, 2004: 12):

for transportation,

handling and protection of goods,

insurance of goods and vehicles,

to a natural loss on the way,

Commission,

travel and customs expenses,

on registration of payment and commodity documents,

interest for payment loans,

other expenses for stock preparation and acquisition.

Stocks that enter the organization and are registered in the accounts of accounting, evaluate:

on the full actual procurement cost;

at the invoice value with the allocation on a separate account of transportation and procurement costs;

at discount prices with a deviation from the actual cost price.

In the balance sheet reserves are reflected only at the actual procurement cost.

Inventories that are written off as an expense and are eliminated from the organization are estimated:

at cost;

at unit cost of inventory;

at the cost of first-time acquisitions (FIFO method),

at the cost of the most recent acquisitions (the LIFO method).

Purchased goods arriving in the organization, come to the account "Goods" in the evaluation of the prices of purchases or sales prices (in retail trade). In the latter case, the amount of the trade margin for the goods received is reflected in the separate. contract account.

In the balance sheet, the purchased goods reflect only the prices of purchases. Stocks of unfinished production in mass production and mass production are reflected in the balance sheets of Russian organizations for regulatory (planned) or actual production. cost,

according to estimates within the limits of direct cost items or only raw materials, materials and semi-finished products.

In a single production, work in process is estimated at actual production costs. Stocks of finished products are reflected at actual cost, at the standard (planned) production cost or by actual costs, according to standard (planned) expenses in direct items (McComas, 2002: 5):

raw materials and materials;

purchased products and semi-finished products;

fuel and energy for technological purposes;

wages of industrial workers.

Efficiency - the central economic category, the main indicator of economic and financial activity - is the object of traditional research in various branches of economic science. The number of scientists constantly pays great attention to the problem of its evaluation.

From domestic scientists, the greatest contribution to the study of this issue was made by M. Dolishny, I.O. Blank, D.G. Zaruba, I.Ya. Katz., C. V. Mocherny, SF Pokropivny, V.K. Chernik, etc. But issues of economic efficiency evaluation remain unresolved on the basis of efficient use of the resource potential of enterprises, in the conditions of expanding the range of products, improving its quality and competitiveness, transforming the sales system, pricing policy, taking into account industry specific features. These directions provide an opportunity to further study the issues of economic efficiency assessment, among which the most relevant is the choice and formation of a system of indicators.

The purpose of the work is to substantiate the basic requirements for the formation of a system of indicators for assessing economic efficiency, taking into account the specifics of the activities of retail enterprises.

A system of indicators is understood as a set of interrelated indicators reflecting economic processes that take place under certain conditions, place and time, with each indicator having a certain quantitative expression.

When choosing the indicators of economic efficiency for the formation of their system, the following outgoing moments should be taken into account: adhere to the existing methodological provisions for calculating the necessary indicators taking into account industry specificity; select a limited, but sufficient for an exhaustive and reliable assessment of a set of indicators; necessarily include performance indicators for the implementation of other, non-operational activities; To allocate directions of an estimation under separate criteria (Balakrishnan, Pangburn and Stavrulaki, 2005: 4) .

Studies of economic literature on the formation of a system of indicators of economic efficiency make it possible to identify two approaches of scientists: the first is defined as a multicriteria list of general performance indicators of enterprises and the second is built on the basis of an integral indicator that generalizes all existing ones.

At the enterprise level, management is interested, first of all, at the expense of what factors a certain level of efficiency, problematic moments in the organization of the enterprise's activity has been achieved. In this case, and this opinion is shared by many economists, it is necessary to apply the system of generalizing performance indicators of the enterprise as a whole, presented by private indicators, systematized according to the relevant criteria (Baldenius and Reichelstein, 2000:12).

An important factor in the development of a system of performance indicators is the consideration of industry-specific features of the enterprise.

First, the peculiarity of using various methods of labor and the significance of the size, composition and location of the passive part; use of the active part to a large extent to create comfortable working conditions and quality of service; low level of use of machinery and equipment to influence the subject of labor (goods); limited use of machinery and mechanisms to improve the efficiency of workers; use of leased fixed assets in the process of operations.

Secondly, the peculiarities of the formation of commodity stocks in a trading enterprise include: a high dependence on the size and range of the population's demand; dependence of the amount of turnover on the availability of commodity stocks; the influence of qualitative characteristics of the product on the size of its stocks in terms of delivery conditions; rhythm of production, durability and storage capacity; a short technological cycle, that is, the duration of the goods in the enterprise, reduce the size of the stock to a minimum.

Thirdly, the peculiarity of retail enterprises is the high level of labor operations, which are connected with customer service and require contact with them, they are usually not amenable to mechanization and automation, which requires an increased cost of living labor. In addition, the formation of financial resources, the location of enterprises, peculiarities of relations with buyers, and many other factors have their own peculiarities (Balakrishnan, Pangburn and Stavrulaki, 2005: 3).

Thus, all the features of retail trade identified by the results of the research should be taken into account during the development of the system for assessing economic efficiency, the use of which in the practice of enterprises will provide an opportunity to assess the level of use of the resource potential, identify possible ways to improve it, conduct a comprehensive analysis of the economic efficiency of enterprises .

CHAPTER II:
METHODOLOGICAL BASIS OF INVENTORY MANAGEMENT IN THE ENTERPRISE

2.1. The problem of forecasting the demand for inventories

Inaccurate demand forecasts are often viewed as the source of all the evils of the organization. The logistics department dreams about that everything was known in advance and it was possible to plan purchases and deliveries. At the same time, logisticians want long-term forecasts to be built. Is it correct? What really needs to be done to improve the accuracy of forecasting?

Usually it is the logistics department that complains about the lack of accurate forecasts, since too much in its work depends on them. But not always managers understand what degree of accuracy can be said in this case and how it is possible to solve this problem.

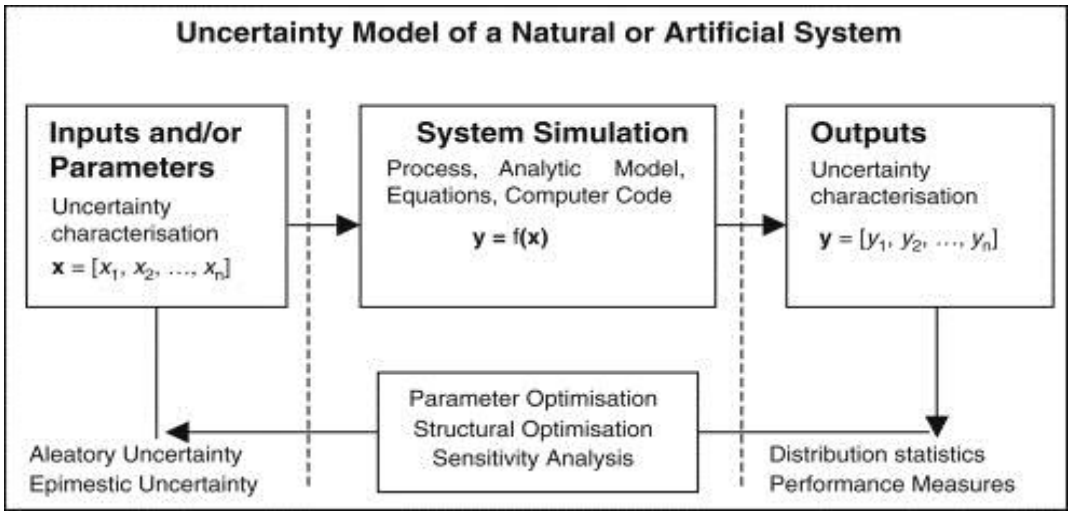
Prediction by definition is a look into the future, so it will never be absolutely accurate. That is, it is necessary to develop a logistics system in such a way that it does not fully depend on the accuracy of forecasts, but is flexible and could adequately respond to any changes in demand.

And at the same time, it can not be assumed that forecasts do not give anything. Of course, they should be an integral part of the work of the logistics department (planning). But in order to use them correctly, you need to know their basic properties (Lai, 2006: 4).

1.The accuracy of forecasts is higher for product groups than for individual products. Try, for example, to predict the growth of the first

passer-by. It takes a lot of luck to do this for sure: he can turn out to be both a basketball player and a dwarf. But the forecast of "average" growth of one hundred passers-by can be quite accurate. The forecast for the group is more accurate than the forecast for its individual representative, since in this case there is an "inter compensation" of deviations: in one case, the forecast is overstated, in the other case it is understated, but in general it is quite acceptable. This is shown in Fig. 2.

Figure 2. Accuracy of the predictions of the dependence on the analyzed parameter



2. The accuracy of forecasts is higher for a near-term perspective than for long-range ones. So, to predict the family budget for the next month is much easier than for the same period, but in a year. Prediction is similar to shooting: the further from the goal, the more difficult it is to get into it. Often the head of the logistics department will hear: "You just give us orders for as long as possible, and we will provide them 100%." However, for this reason, this approach to demand forecasting works against customers: when developing a procurement plan and production, the probability of error in this case increases dramatically (Kontush, 2012: 2).

The production planning manager does not really need to know what names he will produce at some distant time. He must know what

capacity he will need. This forecast is less complicated and at the same time more accurate than a detailed forecast of demand.

There are conditions under which it is not advisable to forecast demand at all (Kontush, 2012: 2):

when the acceptable time for waiting by the client, while his order is fulfilled, exceeds the time for production and purchase of components; in other words, the customer is willing to wait for his order as long as the organization will need to fulfill the order without prior planning;

if the capacity and other necessary resources to fulfill the orders of customers of these organizations can be changed quickly and do not require significant costs;

when there is no need for financial planning.

In all other cases, without forecasting the demand can not be dispensed with. However, it is necessary to form demand forecasts exactly as much as specific goals require. Each of the following parameters of demand forecasts should be justified by the purpose of its use and determined before the forecast begins.

- Planning horizon. For what period in the future should a forecast be made? 10 years? 12 months? A week?

- Level of detail. Should the demand forecast reflect the end products by customers? Or is there enough of a summary plan for the categories?

- Frequency of revision. Is the demand forecast required to be reviewed once a year? Once a quarter? Once a month? Once a week? Everyday? Each hour?

- Interval of forecasting. What time intervals should reflect the demand forecast? Years? Months? Weeks? Days?

There are many classifications of methods for forecasting demand. For convenience, there are only two groups: expert and statistical.

The former are based on expert assessments and are subjective in nature. Their essence lies in the translation of various expert opinions into the formulas from which the forecast is formed. Expert methods include: the method of commission, "brainstorming", questionnaire survey, the Delphi method.

Statistical methods involve the use of statistical calculations to build a future based on the past. A typical example is the methods of calculating the averages. One of them is the use of a moving average. Suppose a company wanted to use a moving average of 12 weeks to forecast the demand for some product. For this, sales are summed up over the last 12 weeks, the sum is divided by 12, thus obtaining an average value. After 7 days, add sales for the last week and discard the first week, receiving data again in 12 weeks. In this case, we are talking about using a simple average. Example calculation (Khasin and Meggido, 2001: 15):

Old forecast (monthly sales) - 100 units.

Actual sales (last month) - 80 units.

New forecast (simple average) - 90 units.

One of the obvious drawbacks of this method is that actual sales are given the same weight as the old forecast. It is usually better to give more weight to the old forecast and smaller - to current sales, since the latter can represent a random variation, the only one of its kind.

2.2. Classification of inventory management systems and costs for their formation and storage

The inventory management system is a set of measures to create and replenish stocks, organize continuous monitoring and operational planning of supplies.

The main mechanism of the inventory management system, which must be implemented in the work of all elements, is to implement the principle of feedback. The essence of this principle is that if the guiding link of the system has a controlling effect on its operational element, then the system should have an "inverse connection" that ensures the receipt of data on the new state of the entire system and assesses the effectiveness of its functioning. The system will be manageable if, after exposure to it, it is possible to determine its new state, evaluate it and take the following corrective effect on it, taking into account the new system data obtained.

At the first level of the system are the modules of the warehouse program and databases, in which information about the movement of goods and work with customers on the shipment of goods accumulates.

The second level of the system consists of various models of inventory management, using the necessary mathematical apparatus to assess the current state of the reserves and develop recommendations for their effective management (Khasin and Meggido, 2001: 16).

At the third level is a model of financial management and rules that allow you to monitor the financial status of stocks. It assesses the economic effectiveness of the adopted rules for the formation of stocks, determines the financial sources for their acquisition and the overall financial strategy of inventory management.

Thus, the basis of the inventory management system is technology analysis of the state of reserves and the external environment, as well as the rules for making decisions on the formation of stocks. The rules themselves can be implemented in the form of specialized software modules and instructions for personnel.

In the framework of many theoretical studies and vast practical experience of solving the problem of inventory management, a number of firms use one of the following systems having their advantages and disadvantages.

In the process of stock regulation, different quantitative levels of stocks are allocated (Lieberman, at all, 1999):

• the maximum reserve equal to the amount of guaranteed, preparatory and maximum current stocks. Its size is set to control excess resources,

• average, or carry-over stock, equal to the amount of guaranteed, preparatory and half of the current stock. The value of this indicator corresponds to the standard size of the stock;

• a minimum reserve equal to the amount of guaranteed and preparatory. Reduction of stocks to this level is a signal for their emergency replenishment.

In the process of inventory management, it is important to establish the moment, or the point of the order and its required size.

The point of the order is the established maximum level of the stock, when it reaches an order for the supply of another consignment of tangible assets.

The size of the order is the amount of materials to which an order should be placed to replenish their stock. If the minimum reserve is reached at the time of receiving a new batch, then it reaches the maximum level.

You can adjust the size of the order by changing the lot size, the interval between deliveries, or changing the volume and delivery interval. Depending on this, the following systems are used in inventory management practice (Gaur, Fisher and Rahan, 2002):

1. Control system over the state of stocks with a fixed periodicity of the order. According to this system, inventory control is carried out at regular intervals (a week, a decade, a month) by inventorying the balances. For example, every Tuesday a company manager looks at the leftovers of goods and makes an order for the delivery of a new batch of goods. Thus, the time interval between orders remains constant, and the order size varies depending on the intensity of consumption, i.e. is a variable.

T - fixed time interval between deliveries of goods

The size of the ordered consignment is determined by the difference in the maximum stock allowed by the standard and the actual stock. Since a certain period of time is required to execute an order, the amount of the ordered lot is increased by the amount of the expected expenditure for this period (insurance stock). The size of the ordered lot (P) is determined by the following formula:

P = змакс-зфакт + зстр,

where Zmax is the maximum stock provided by the norm; Zfakt - actual stock at the time of verification: Zstr - insurance stock.

The intensity of demand in this model is the magnitude of the variable. And since the order is carried out at regular intervals, the quantity of the ordered batch in different periods will be different. Therefore, it is possible to apply this system when it is possible to order lots of different sizes. For example, in the case of container or wagon delivery of goods, this system is unacceptable. In addition, the system is not used if delivery or placing an order is expensive. For example, if the

demand for the past period was insignificant, then the order will also be insignificant, which is permissible only if the costs associated with the execution of the order are insignificant. Another feature of the system is that it allows the emergence of a deficit. If demand sharply increases, the stock of the goods will end before the deadline for the submission of the order. This means that the system is applicable when possible losses from a deficit for an enterprise are insensible (Cuthbertson and Gasparo, 2003: 45).

Thus, the system of control over the state of stocks with a fixed periodicity of the order is applied in the following cases:

- Delivery conditions allow receiving orders in different lots;
- costs for placing an order and delivery are relatively small;
- losses from a possible deficit are insignificant.

The advantage of the considered system is its simplicity, since regulation is carried out once during the entire interval between deliveries. Among the shortcomings of the system can be attributed the emergence of the danger of depletion of stocks with their unforeseen intensive consumption until the next order moment.

2. Control system over the state of stocks with a fixed order size. In this system, the size of the order to replenish the stock is a constant value. The time intervals through which the order is placed, in this case may be different. The number of ordered products is determined by agreement between the supplier and the buyer. It is definite and fixed, and the time of the order is accepted as a variable. The order for the delivery of the next batch is given when the stock size in the warehouse is reduced to the established threshold level-the order point. The intervals between deliveries of the next consignments to the warehouse depend on the intensity of consumption (consumption) of material resources. After placing the next order, the stock continues to decrease,

since the order is executed not immediately, but after a certain time interval (T). The stock level corresponding to the order point is equal to the expected demand for the time of delivery delay from the order plus the margin (Cook, Houston and Kinney, 2012: 12):

where $З_{ra}$ - stock of the point of the order; P - average daily consumption of material; T - the period of order fulfillment; Z_{str} - insurance stock.

The quantity of the stock at the point of the order is chosen such that, in the normal working situation, the stock does not fall below the insurance level during the time T. If the demand unexpectedly increases or the delivery time is violated, then the insurance stock will start working. The commercial service of the enterprise in this case must take measures providing additional supply. Apparently, this control system provides for the protection of the enterprise from the formation of a deficit.

It is conventionally assumed that the time interval between the supply of the purchase order and the arrival of the batch to the warehouse (T) is a constant

In practice, the system of control over the stock status with a fixed order size is used mainly in the following cases (Chen, 1998: 12):

- large losses as a result of lack of stock;
- high storage costs;
- high cost of the ordered goods;
- high degree of uncertainty in demand;
- availability of a discount from the price, depending on the quantity ordered.

The advantage of this system is that the receipt of material in the same lots leads to a reduction in the costs of delivery and maintenance of stocks. The drawback of the system lies in the need for constant labor-

consuming control over the availability of stocks and, as a consequence, increasing the costs associated with their regulation.

3. A system for managing the state of a stock of a material resource with a marginal (or production) stock level and random demand. Movement of stocks (arrival, consumption) in the control system under consideration is carried out at random moments of time.

A system with a marginal level of stock and random demand should have the ability to adjust the size of the demand for resource consumption, since otherwise situations with an absolute deficit may be created. In this regard, it is necessary to consider the various situations characterizing the stock management system with their marginal level and random demand.

The system is, in principle, organized by one parameter-the limiting level of the stock. The threshold level is only a guideline in determining the moment of placing an order. Since the demand in the system is random by the condition, then, at any moment of time, resource consumption can be different in magnitude, including equal to the rest of the resource, which forms an absolute shortage of the resource until the next delivery.

Such a system is organized in those fairly frequent cases when the demand for a resource in production or trade is highly uneven, and this unevenness is a function of the magnitude of the order, the time of the order and the number of consumers (Chen, Frank and Wu, 2005: 14).

High demand for a resource often ends with a sharp decline. This circumstance forces us to form a reserve of the resource, proceeding from two possible conditions: 1) the production reserve and 2) the marginal reserve, i.e. ensure resource consumption in the intervals between deliveries (production stock) or for the time of completion of one turnover of working capital (marginal reserve). If the demand for a

resource is high, then you should focus on the marginal supply; if the demand for the resource falls, then the benchmark of the required stock can be its production option.

4. The minimum-maximum inventory management system is fundamentally different from other systems due to the fact that it is focused on a situation with significant costs for maintaining stocks and replenishing them. In this system, the costs associated with inventory management can be commensurate with the losses from a stock deficit, orders are fulfilled provided that the stock in a warehouse at a certain point in time turned out to be equal to or less than the established minimum level. The order size is calculated so that the supply replenishes the reserves to the maximum level. Thus, the inventory management in the system under consideration is carried out at two levels: the minimum and the maximum, which determined its name.

If at the time of placing the order in the balance there was less margin than the stipulated minimum level, then there may be a situation with a shortage of the resource. This circumstance should be taken into account at the time of writing-off of a part of the resource on the basis of a demand or a limit-fence card. In other words, at the moment of writing-off the resource in the rest of the stock should be no less than what is provided by the program.

2.3. Formation of a market approach to inventory management

The functioning of any Russian enterprise in market conditions is due to uncertainty and instability. The previously used management concepts no longer justify themselves under the new conditions - this is the reason for interest in the inventory management systems of

enterprises (firms, companies, etc. - further "enterprises"), which have proven themselves abroad. In connection with the current economic situation, many Russian enterprises have begun a systematic transition to logistics management methods for stocks and working capital.

The application of the logistics method in foreign companies allowed them to achieve tremendous success. For example, the transition to logistics approaches to management in US firms (companies, etc.) allowed to reduce the share of reserves in the US GDP from 29% in 1959 to 18% in 1994. According to expert estimates, the use of logistics methods allows to reduce the level stocks by 30-50% and reduce the time of production by 25-45%. And this is one of the main goals that are solved when implementing a logistic method of enterprise management.

Logistics came to us from countries with developed market economies. One of the advantages of this method of enterprise management is that the optimization of financial, material, information, etc. flows at the enterprise is not produced separately for each of them, but all in a complex. By means of multivariate calculations of their joint organization there is such a way that would ensure a reduction in the costs of organizing all these flows and processes.

Let us illustrate briefly how this is all done approximately in foreign firms. Depending on the amount of demand in the market for finished goods (GP) produced by the enterprise, the following is set in the first of the multivariate calculations (Chen, 1998: 11):

number of machines for each process operation (for example, three lathe, five milling, etc.) and the routes of the machined semi-finished parts from the machine to the machine, from the shop to the shop;

each machine in the containers must have as many details-blanks for processing on the corresponding technological operation;

by what date and to each machine the following batch of details should be submitted;

how much and in what volume should the material resources (MR) and component parts come in, how much of the production reserve (PP) of each MR brand should be in stock;

Similarly, all operations to ensure sales and promotion of SOEs to each wholesaler and retailer (GP volume, time, etc.) are set, etc;

This option determines the total costs of organizing all flows and all processes.

Then calculate the 2 nd, 3 rd, ... 10000 th, .. etc. options. When calculating each of the following, the number of machines involved, the routes of movement, the number of workpiece parts for each machine, the MR and GP stocks in warehouses, the volume and time of their delivery, etc., change. For each option, the total costs are determined. And in the long run, they choose the option from all, at which the estimated total costs will be minimal. If the situation on the market has changed, then all this titanic calculation work is carried out again.

Russian enterprises, which are likely to be forced to switch to logistics management methods in the near future, will encounter a completely new methodology for organizing supply, transporting material resources, manufacturing and marketing finished products, forming MR stocks, etc. This will require each consumer enterprise to form the necessary logistics environment for itself from reliable suppliers and transport organizations, which is one of the most important strategic tasks. The obstacle to this will be the features of the structure of material and technical supply (MTS) of enterprises in Russia that has developed over many years (Chambers and Lacey, 2011:5). At the stage of introduction of the logistics management method, further normative management method will be required. In this regard, consider the

relationship between the two approaches in the management of material flow and working capital (OS): logistical and regulatory management methods. But first we define the term "flow" as the basic concept in logistics. "A stream is a collection of objects perceived as a single whole, existing as a process over a certain time interval ...".

In this article, from financial flows, we will only consider those that ensure the movement of material flows, i.e. OS of the enterprise. According to foreign data, "... in the cost of time for the delivery of goods from the primary supplier to the final consumer, 2% of the total time from the entire time cycle falls on production, 5% - for transportation, 8% - preparatory-final operations, and 85% time of lying down of materials and products. " Thus. 93% (ie 85% + 8%) of the entire time cycle MR are in stocks, stocks of work-in-progress. The bulk of the time the material flows represent the stocks of the enterprise.

Specificity of the same standardization in a market economy and enterprise autonomy is that employees themselves develop for their enterprise all the necessary regulatory framework, which their top manager claims. Considering the focus of this article, in the future we will mainly consider only reserve norms and current assets standards. For their development, you can use, for example, "Methodological recommendations ...", which include five typical methods (for raw materials and materials, components and purchased semi-finished products, spare parts, motor fuels, GP). Unlike previously issued techniques and instructions, a unified methodology was laid down in the "Methodological recommendations ..." that allows to standardize the reserves of different categories (production, marketing, commodity) and various brands of MR (raw materials, materials, components, spare parts, etc.) and GP, as well as the OS on a single methodological basis.

Let us explain the eight fundamentally new methodological approaches to the normalization of the OS and the reserves included in the algorithms of these "Methodological Recommendations ...", which provided the possibility of their application in a market economy. But before turning to their consideration, we briefly recall some of the main theses of the theory of inventory management and the OS, tk. they will be required to explain and justify the foregoing. These approaches to rationing at the enterprises were applied earlier and saved in the "Methodical recommendations ...". Among them are the following:

calculations of reserve norms and working capital standards are carried out throughout the specified MP nomenclature used in the enterprise. In this case, the specified (by MP mark) and specific norms of the PP are specified. Specific norms are calculated on the basis of the account of the normative factors (NF - changes during the year: volumes of supplies, intervals between deliveries (further intervals), volumes of daily holidays, etc., and also take into account the time spent on preparatory operations). Specific norms of PP are determined by aggregation of the calculated specified norms included in the standardized MR type, by weighing them according to the corresponding average daily expenses in physical terms;

for the specified norm of the PP, the average reserve value is accepted, the minimum necessary and sufficient to ensure an uninterrupted production process (Baldenius and Reichelstein, 2000:3);

Specific (as well as specific) PP norms are defined as the sum of three components - current, insurance and preparatory components. In the same structure, the OS standards are calculated (specified, species, element-wise, on balance sheet items, OS-total). The division of PP into components (current, insurance and preparatory) is a conditional

settlement method in order to take into account various NFs and different conditions for the formation of PP in these constituent norms;

current and insurance components of the specified norms of PP are calculated simultaneously on the basis of accounting for the same NF. At the same time, the current component is calculated from the balance condition in each interval between the delivery volume and the total expenditure (ie leave) for this period, and the insurance component is calculated from the imbalance between the same indicators;

Specific and specific norms of reserves, as well as their components, are determined in physical terms and in relative values - in "days" of average daily consumption in physical terms. The norms of the OS are calculated in terms of value (in thousand rubles), and the norms of working capital (specified, species, element-wise, by balance sheet items, OS-total) and their components - in relative values: in "days" of average daily consumption in value terms etc.

Let us explain the essence of the above eight new features, which for the first time are incorporated into the developed methodology for rating the OS and reserves (Chambers and Lacey, 2011:5).

The first new approach is the possibility of applying the developed methodology in modern conditions. We will justify that the methods of rationing, given in the "Methodical Recommendations ...", although they were developed more than 12 years ago, are still valid today for determining the OS and FP norms at enterprises in a market economy. The point is that the specified norms of PP, as indicated above, are calculated on the basis of accounting for NF, which characterize the conditions for the formation of stocks - for example, taking into account the necessary time for unloading the received MR brand to the enterprise, drying lumber, etc., non-uniformity of deliveries by volumes and intervals, etc.

CHAPTER III:
DEVELOPMENT OF INVENTORY TOOLS FOR INDUSTRIAL ENTERPRISES

3.1. Analysis of the nomenclature of production inventories of the enterprise

It should be noted that the analysis of stocks by many scientists is reduced to the analysis of stocks of raw materials. However, the total amount of reserves reflected in section II of the balance sheet includes stocks of raw materials and materials, finished goods and work in progress.

Here it should be said that the provision on accounting "Inventory accounting" PBU 5/01 (paragraph 1.4) excludes production from work in progress from the category of inventories , meanwhile in the balance sheet - work in process is reflected as a structural component of the category "stocks".

International Financial Reporting Standards ("IFRS") offer a slightly different interpretation of inventories of inventories, so, according to IFRS 2,

· Goods and other property intended for resale · finished products produced by the company · incomplete products, including raw materials and materials that are in the production process (Rajeev, 2010: 34).

Thus, it should be noted a fundamental difference in the approach to the classification of inventories adopted in international and Russian accounting practice. It consists in the fact that raw materials and materials in the classification of IFRS are not a separate category, while in the Russian accounting practice raw materials and materials occupy a

special place, which can not be said for work in progress, which PBU 5 does not include in inventories .

The concept of development of accounting in Russia provides for the transition to international accounting standards, therefore, inventories should also be classified as inventories (Chen, 1998: 5).

Proceeding from this, studying the size and structure of reserves, the main attention should be paid not only to the trends in the change of production stocks, but also to the costs of work in progress, finished products, goods.

Under IFRSs, inventories should be valued at the lower of cost and net realizable value, which is "the estimated selling price in normal business conditions, net of transaction costs and sales costs."

The cost of inventories includes all production, processing and other costs incurred to deliver, place inventories and bring them to the required state. PBU 5/01 does not include the processing costs that arise when processing materials into finished products, to the cost of inventories.

Are not included in the cost price, but the following costs are taken into account as an expense during their occurrence: excessive losses of raw materials, labor inputs and other non-production costs; storage costs of finished products; general administrative expenses; sales costs.

In Russian accounting, these costs are accounted for as part of cost, which leads to an increase, which in turn affects pricing.

Inventory valuation is written off using one of the following methods:

· "FIFO" method ("first admission - first leave"), · Weighted average cost method, · Specific identification method.

For all stocks that have the same purpose, the same valuation method is used.

According to PBU 5/01, along with the mentioned above, the "LIFO" method is also used, which in world practice is prohibited for use, since it allows underestimation of reserves and profits in conditions of rising prices, which contradicts the principle of prudence. In some cases, the sale of stocks is carried out at a price below the cost price. In this case, the cost of inventories should be reduced to the net selling price by creating a provision for impairment of inventories.

A review of the net selling value of all inventories should be made in each reporting period. In the event of an increase in the selling price for finished products, the value of which was previously lowered and which continues to be in stock, the value of this product is restored at the expense of the reserve. The new carrying amount will represent the lower of the production cost and net realizable value. The reduction in the value of inventories to the net selling price is recognized as an expense. The cost of inventories is charged to expenses in the reporting period when the corresponding revenue from sales of inventories was recognized. Inventories whose cost is included in the value of other assets are recognized as an expense over the useful life of the assets.

At present, economic relations related to economic transactions reflected in accounting are regulated by such branches of legislation as civil, tax, labor, customs, administrative, accounting, and criminal.

Every fact of economic life, which is reflected in accounting, leads to the emergence of certain legal consequences, which depend on the operation of various branches of legislation - a set of legal norms governing public relations in general or one of their types (Gaur, Fisher and Rahan, 2002: 7).

Accounting financial accounting is mandatory for all organizations, the order of its maintenance is regulated by the legislation of the Russian Federation on accounting (4 levels). Financial accounting statements are open for publication and are intended for both the administration of the organization and for external users. The main stages of financial accounting are collection, registration and generalization (systematization and accumulation) of information.

Collection and registration of information in financial accounting is carried out by documenting all business transactions (facts of economic activity) produced in organizations. Primary financial accounting documents provide a continuous and continuous reflection of the financial and economic activities of organizations. The stage of summarizing the information contained in the primary accounting documents is to accumulate and systemize it in the financial accounting registers, usually with the help of accounting accounts and a double entry. Information on business transactions made by the organization for a certain period of time from the financial accounting registers is transferred in a grouped form to the financial statements.

The basic rules (principles) of financial accounting are determined by Federal Law No. 129-FZ and the Regulation on Accounting and Reporting.

In the development of this norm of the said Federal Law, "Methodological Guidelines for the Accounting of Inventories" determine the procedure for the organization of accounting of inventories based on the Accounting Regulations "Accounting for Inventories" (PBU 5/01).

When acquiring, storing and (or) selling certain types of goods, losses and shortages can arise, the cause of which is natural loss. About what is a natural loss, how to calculate it and reflect it in the accounting

and tax accounting, - the definition is given in the Methodological recommendations for the development of norms for natural loss.

The property that is the property of the organization is accounted for separately from the property of other legal entities. This requirement is disclosed in the rules for accounting for real assets, established PBU 9/99 "Income of the organization", and PBU 10/99 "Expenses of the organization." These provisions determine the order of accounting for business transactions for the purchase and sale of goods, characterized by different options for combining the terms of the contract on the moment of transfer of ownership of the property being sold (acquired).

For successful inventory management, at every moment the enterprise must have the necessary quantity of raw materials and materials necessary for the uninterrupted supply of production.

Many managers think that if you purchase raw materials and materials in large quantities, then the organization will benefit from the increase in prices for these types of raw materials. This approach is not always effective, since the costs associated with storing a batch of raw materials and materials purchased "in reserve" often exceed the price gain.

As a consequence, with the acquisition of raw materials and materials "for future use", the enterprise automatically loses additional profit, which could be obtained if raw materials and materials were acquired as close to the date of their release into production. These losses directly depend on the amount of raw materials and materials and the timing of their storage.

Corruption during storage, as well as physical and moral aging, also entail losses. Constructive changes in production technology can also cause instant obsolescence of available stocks of raw materials.

Undesirable and too low level of production stocks. Due to the inevitable delays associated with the placement of orders, transportation, warehouse processing of raw materials and materials, the enterprise can not purchase raw materials and materials only at the time of receiving the order of the production workshop. Maintaining reserves at a certain level in accordance with the release forecast contributes to the stability and rhythm of the release of raw materials and materials into production.

An enterprise should always have enough raw materials and materials to satisfy the needs of production without delay, but one can not invest a lot of money to create excessive stocks that will be useless to lie in the warehouse (Balakrishnan, Pangburn and Stavrulaki, 2005: 4).

The expenditure of materials from the stock is usually determined by the demand or the rate of their use, i.e. is not amenable to regulation by the persons managing the stocks. Therefore, they must focus on managing the receipt of materials in stocks, Thus, when managing any stocks, you have to constantly make two decisions: about the time of issuing the purchase order or the production of the goods for the replenishment of the order and the quantity or volume of the order.

The purpose of audit of material and industrial reserves (MPZ) is to form an opinion on the reliability of reporting indicators for items of material values "Stocks" and the compliance of the methodology used in the organization for accounting and taxation of operations with MPZ in the normative documents in force in the Russian Federation.

The goal can be achieved by conducting materiality tests, as well as tests on the effectiveness of control structures and accounting systems, while assessing the risk of an audit, which depends on the nature of the company's reserves and their importance for accounting reports. The inspection of stocks is considered as the main part of the audit at those enterprises where their value is significant (Ozer, 2016:14).

Planning, being the initial stage of the audit in accordance with FPSAD No.3 "Audit Planning", provides for the preparation of a general plan and an audit program. In general, the types of work and the timing of the audit, in the program - the types and sequence of the implementation of audit procedures, the period of their conduct, the executors, working documents. During the audit, the auditor should establish (Balakrishnan, Pangburn and Stavrulaki, 2005: 1):

· Whether there are actually MPs (by participating in the inventory or evaluating its results);

· Are all operations with the IPM, which should be reflected in the accounting accounts, are actually presented in them (documentary verification);

· Whether the organization is the owner of all MPZ, i.e. whether there are property rights to them, and amounts reflected as indebtedness - obligations (the legal aspect of the audit);

· Whether the IPM and related obligations are properly valued;

· Whether the principles of accounting for inventories were correctly chosen and applied.

The information base for checking MPD are:

· Regulatory documents relating to the reception, accounting, storage and release of material values;

· balance sheet;

· main book;

· Order on accounting policy;

· Primary documents on registration of operations with MPZ;

· Registers for the accounting of MPZ.

In Russia, the relevant legal framework for auditing has been created, and the system of its regulatory regulation has been determined.

The fundamental document is the Law of the Russian Federation of August 7, 2001, No. 119-FZ "On Auditing" (taking into account the amendments and additions introduced by Federal Law No. 164-FZ of December 14, 2001).

3.2. Development of the simulation economic-mathematical model of inventory management

In accordance with this document, when auditing an audit, audit organizations and individual auditors have the right (Panigrahi, 2013:3):

1) independently determine the forms and methods of conducting the audit;

2) to check in full the documentation related to the financial and economic activities of the entity being audited, as well as the actual availability of any property recorded in this documentation;

3) to receive explanations from the officials of the audited entity in oral and written forms on issues arising during the audit;

4) refuse to conduct an audit or express their opinion on the reliability of financial (accounting) statements in the accounting opinion in the event that the audited entity fails to provide all necessary information, and if circumstances that significantly influence the opinion of the audit firm or the auditor on the degree of reliability of the financial (accounting) statements of the entity being audited.

5) To exercise other rights that do not contradict the legislation of the Russian Federation.

When conducting an audit, audit organizations and individual auditors are required to (Lieberman, at all, 1999):

1) carry out an audit in accordance with the legislation of the Russian Federation;

2) provide, at the request of the audited entity, the necessary information on the requirements of the legislation of the Russian Federation relating to the conduct of the audit, as well as on the regulatory acts of the Russian Federation on which the observations and conclusions of the audit firm or individual auditor are based;

3) within the period established by the contract for the provision of audit services, to transmit the audit report to the audited entity and (or) the person who concluded the contract for the provision of audit services;

4) ensure the safety of documents, not disclose their contents without the consent of the audited entity and (or) the person who concluded the contract for the provision of audit services;

5) perform other duties that do not contradict the legislation of the Russian Federation.

Inventories make up a significant part of the value of the organization's property, therefore the purpose of the audit of inventory accounting is to confirm the reliability of data on the availability and movement of inventory items, to establish the correctness of processing operations for production reserves in accordance with the current regulatory enactments of the Russian Federation.

When developing the verification program, the head of the audit team should take into account that the audit of material values is very laborious. Therefore, when organizing an audit, a selective method is used and only in exceptional cases it is continuous. The size of the sample and the scope of the audit procedures depend on the degree of the auditor's confidence in the system.

In modern literature there is no single point of view on the question of what is meant by imitation modeling. So there are different interpretations (Balakrishnan, Pangburn and Stavrulaki, 2005: 1):

Simulation modeling is a method that allows you to build models that describe processes in the way they would actually go. Such a model can be "lost" in time for both one test and a given set of them. The results will be determined by the random nature of the processes. From these data, it is possible to obtain fairly stable statistics.

Simulation modeling is a research method in which the system under study is replaced by a model that describes the real system with sufficient accuracy and experiments are conducted with it to obtain information about this system. Experimentation with the model is called imitation (imitation is a comprehension of the essence of the phenomenon, without resorting to experiments on a real object).

Simulation modeling is a special case of mathematical modeling. There is a class of objects for which, for various reasons, analytical models have not been developed, or methods for solving the obtained model have not been developed. In this case, the mathematical model is replaced by a simulator or a simulation model.

The simulation model is a logical-mathematical description of an object that can be used to experiment on a computer for the purposes of designing, analyzing and evaluating the functioning of an object.

Simulation modeling is used in cases when (Cuthbertson and Gasparo, 2003: 421):

- expensive or impossible to experiment on a real object;

- it is impossible to build an analytical model: the system has time, causal connections, consequence, nonlinearities, stochastic (random) variables;

- It is necessary to simulate the behavior of the system in time.

The aim of simulation is to reproduce the behavior of the system under investigation on the basis of the analysis of the most significant interrelations between its elements or other words, the development of a

simulator of the subject domain under study for carrying out various experiments.

Simulation modeling allows to simulate the behavior of the system in time. And the plus is that time in the model can be controlled: slow down in the case of fast processes and accelerate to simulate systems with slow variability. You can simulate the behavior of those objects, real experiments with which are expensive, impossible or dangerous.

Applications of simulation modeling (Cook, Houston and Kinney, 2012: 13):

- business processes;
- fighting;
- population dynamics;
- road traffic;
- IT infrastructure;
- mathematical modeling of historical processes;
- logistics;
- pedestrian dynamics;
- production;
- market and competition;
- service centers;
- supply chain;
- traffic;
- project management;
- health economics;
- ecosystems.

Agent modeling is a relatively new trend in simulation modeling that is used to study decentralized systems, the dynamics of their functioning being determined not by global rules and laws (as in other

modeling paradigms), but vice versa. When these global rules and laws are the result of individual activity of group members

The aim of agent models is to get an idea of these global rules, the general behavior of the system, based on assumptions about the individual, private behavior of its individual active objects and the interaction of these objects in the system. An agent is an entity possessing activity, autonomous behavior, can make decisions in accordance with a certain set of rules, interact with the environment, and also independently change.

Discrete-event modeling is an approach to modeling that offers to abstract from the continuous nature of events and to consider only the main events of the simulated system, such as: "waiting", "order processing", "movement with cargo", "unloading" and others. Discrete-event modeling is the most developed and has a huge scope of applications - from logistics and queuing systems to transport and production systems. This type of simulation is most suitable for modeling production processes. Founded by Jeffrey Gordon in the 1960s.

System dynamics is a modeling paradigm, where graphical diagrams of causal relationships and global influences of some parameters on others in time are constructed for the system under study, and then the model created on the basis of these diagrams is simulated on the computer. In fact, this type of modeling more than all other paradigms helps to understand the essence of the ongoing discovery of cause-effect relationships between objects and phenomena. With the help of system dynamics, models of business processes, city development, production models, population dynamics, ecology and epidemic development are built. The method was founded by Forrester in the 1950s.

3.3. Economic efficiency of inventory management

Below is a list of arguments in favor of the use of simulation modeling, as well as cases where its use is contraindicated (although we should immediately note that this list is by no means exhaustive - rather we list the well-known advantages and disadvantages of simulation modeling).

Benefits (Cuthbertson and Gasparo, 2003: 422):

1. Development of the simulation model of the system often allows a better understanding of the real system.

2. During the simulation, it is possible to "compress" time: years of practical operation of a real system can be simulated in a few seconds or minutes.

3. Simulation does not require the interruption of the current activity of a real system.

4. Simulation models are much more general than mathematical models; They can be used in those cases when for the conduct of a standard mathematical analysis there are no proper conditions.

5. Modeling can be used as a means of training personnel to work with a real system.

6. Simulation provides a more realistic reproduction of the system than mathematical analysis.

7. Simulation can be used to analyze transients, whereas mathematical models for this purpose are not suitable.

8. Currently, many standardized models have been developed covering a wide range of real-world objects.

9. Simulation modeling answers questions like "what if ...".

disadvantages

1. In spite of the fact that it takes a lot of time and labor to develop a simulation model of the system, there is no guarantee that the model will provide answers to the questions that interest us.

2. There is no way to prove that the work of the model fully corresponds to the work of the real system. Simulation involves numerous repetitions of sequences, which are based on the generation of random numbers simulating the onset of certain events. An apparently stable system can - with an unfavorable combination of events - "go hackney" (although this is very unlikely).

3. Depending on the system that we want to model, the model building can take from one hour to 100 person-years. Modeling complex systems can be a very expensive undertaking and take a lot of time.

4. Modeling can be less accurate than mathematical analysis, because - we emphasize once again - it is based on the generation of random numbers. If the real system can be represented by a mathematical model, preference should be given to this type of modeling.

5. To "run" complex models requires quite a lot of computer time.

6. The method of simulation modeling is still characterized by the insufficient use of standardized approaches (although some progress is already being made in overcoming this shortcoming). As a result, models of the same real system, constructed by different analysts, may have little in common with each other.

The use of simulation models in inventory management.

The problem of inventory management arises when it is necessary to create a stock of material resources or commodities in order to meet demand at a given time interval. To ensure the continuous and efficient operation of almost any organization, it is necessary to create

reserves. In any task of inventory management, you need to determine the number of ordered products and the timing of placing orders.

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The demand can be satisfied (Ozer, 2016:14):

by creating a single stock for the entire period under consideration

by creating a stock for each time unit of that period.

These two cases correspond to an excess stock (relative to a unit of time) and an inadequate stock (in relation to the total time period).

With excess stock, higher specific (time-related) capital investments are required, but a deficit occurs less frequently and the frequency of placing orders is smaller.

With insufficient stock, the specific capital investments decrease, but the frequency of placing orders and the risk of a deficit increase.

For any of these two extreme cases, there are significant economic losses. Thus, decisions regarding the size of the order and the moment of its placement can be based on minimizing the corresponding function of total costs, including costs resulting from losses from excess stock and deficits.

Generalized model of inventory management.

Any model of inventory management should ultimately answer two questions:

1. How many products should I order?

2. When to order?

The answer to the first question is expressed through the size of the order that determines the optimal amount of resources that must be supplied whenever the order is placed. Depending on the situation in question, the size of the order can vary with time.

The answer to the second question depends on the type of inventory management system. If the system provides for periodic monitoring of the state of stocks at regular intervals (weekly or monthly), the time of receipt of a new order usually coincides with the beginning of each time interval. If the system provides continuous monitoring of the status of the stock, the order point is usually determined by the level of the stock at which it is necessary to place a new order.

CONCLUSION

Thus, the solution of the generalized problem of inventory management is defined as follows:

1. In the case of periodic monitoring of stock status, it is necessary to ensure the delivery of a new quantity of resources in the volume of the order quantity at regular intervals.

2. In the case of continuous monitoring of the stock status, it is necessary to place a new order in the amount of the stock amount when its level reaches the order point.

The size and the point of the order are usually determined from the conditions for minimizing the total costs of the inventory management system, which can be expressed as a function of these two variables.

Types of inventory management models

The variety of models of this class is determined by the nature of demand, which can be deterministic (reliably known) or probabilistic (given probability density).

Deterministic demand can be static, in the sense that the intensity of consumption remains unchanged in time, or dynamic, when demand is known reliably, but varies from time to time.

Probabilistic demand can be stationary when the function of probability density of demand is unchanged in time, and non-stationary when the function of probability density of demand varies with time.

In real conditions, the case of deterministic static demand is rare. This case can be considered as the simplest. Most accurately, the nature of demand can be described by means of probabilistic nonstationary distributions. The presented classification can be considered a representation of different levels of abstraction of the description of demand.

At the first level, it is assumed that the probability distribution of demand is stationary over time. This means that the same probability distribution function is used to describe the demand during all the time periods studied. This simplification means that the influence of seasonal demand fluctuations in the model is not taken into account.

The second level of abstraction takes into account changes from one period to another, but the distribution functions are not applied, and the needs for each period are described by the average demand. This simplification means that the risk element in inventory management is not taken into account. However, it allows us to take into account seasonal fluctuations in demand.

At the third level of simplification, both risk elements and demand changes are excluded. Thus, demand during any period is assumed to be equal to the average value of the known (by assumption) demand for all the periods considered. As a result of this simplification, demand can be estimated by its constant intensity.

Although the nature of demand is one of the main factors in the construction of the inventory management model, there are other factors that influence the choice of the model type.

1. Delays in deliveries or deadlines for the execution of orders. After placing an order, it can be delivered immediately or it will take some time to execute it. The time interval between the moment of placing an order and its delivery is called the delivery delay, or the deadline for the completion of an order. This value can be deterministic or random.

2. Replenishment of the stock. Although the inventory management system can function with supply delays, the replenishment process can be performed instantaneously or evenly over time. Instant replenishment of the stock can occur if the orders come from an external

source. Uniform replenishment can be when the stock is produced by the organization itself. In general, the system can function with a positive delay in delivery and uniform replenishment of the stock.

3. The time period determines the interval during which the level of the stock is controlled. Depending on the length of time that can be reliably predicted, the period under consideration is assumed to be finite or infinite.

4. Number of points of accumulation of stocks. The inventory management system can include several stock storage points. In some cases, these items are organized in such a way that one acts as a supplier for another. This scheme is sometimes implemented at different levels, so that a point-consumer of one level can become a point-supplier at another level. In this case, they speak of a system of inventory management with a branched structure.

5. The number of products. In the inventory management system, there may be more than one type of product. This factor is taken into account if there is some dependence between different types of products. For example, the same warehousing space can be used for different products or their production can be carried out with restrictions on general production assets.

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