ADJUSTED INVENTORY MANAGEMENT SYSTEM OF LEVELS OF STRATEGIC GOODS DIFFERENTIATED BY USING THE ABC METHOD

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Abstract: *The article deals with the design of optimal inventory management system of levels of strategic goods in the company differentiated using the ABC method of inventory management. The main part of the paper is to determine the correct size of the order of certain goods in order to ensure the future also known in advance consumption without decreasing in inventory below the minimum level - lock stock at a specific delivery cycle.*

Key words: *supply, inventory management, levels of inventory, delivery cycle, future consumption, safety stock*

1   INTRODUCTION

The supply is the functional activity of the enterprise, it is one of the main stages of business activities. The basic aim of the supply is to ensure the material needs of business at an optimal level of costs. In terms of structure of the company is supply the part of material management.

Getting inventory - materials, raw materials, spare parts, semi-finished products and final products related to ensuring the continuous course of the production, trade and satisfying demands of consumers. The role of supply of enterprise is to determine the optimal amount of inventory (required for complete equipment orders / contracts) and the system of management inventory levels. [1]

In the process of inventory management may in storage and of enterprise supply system occur two extreme situations:

- Surplus of inventory - the amount of inventory in stock is higher than the actual consumption (demand)

- Lack of (deficiency) inventory - the amount of inventory in the storage system is lower than the actual consumption (demand)

Surplus causes:
- freezing of funds of enterprise,
- increase the cost of storage and maintenance of inventory,
- there is a deterioration of stocks due to long-term storage.

Deficiency results in:
- stop the smooth running of enterprise,
- loss of profits decline in sales,
- not recovering demand,
- loss of confidence of customers - consumers.

Inventory management in the company is a significant problem to determine the optimal volume of individual types of inventory, namely whether the ordered quantity of stocks (Q) and delivery cycle (t) - the time interval between orders, are correct. [2]

2   INVENTORY MANAGEMENT SYSTEM OF LEVELS

Inventory management is to regulate their status and movement in stock. Accordingly, how this regulation is implemented, there are several systems and methods of inventory management.
One of the most known systems is an inventory management system of levels. Its application can vary according to the number of observed levels of inventory in stock - standards of inventory. The most commonly observed standards of inventory are:

MAX - maximum standard of total inventories equal to the planned average interval of supply.

MIN - Minimum standard of total inventories in days equal to one day plus the number of days of safety stock. In substantive terms, is calculated as the sum of the average daily consumption of safety stock.

AVERAGE- The average inventory is essential for monitoring analysis of committing funds in stocks. It is the arithmetic average of daily physical stocks over time.

SAFETY - safety stock is stable value, to prevent the deficit of inventory and is used only if there are discrepancies between the planned and predicted values of the input or output parameters. [3]

Safety stocks can be determined:

- based on the past experience (1/3 of the average consumption during the delivery period),

- based on the safety times (safety times * daily consumption),

- by applying coefficients of certainty,

- based on the results of analytical and statistical methods.

Using the methods for determining the appropriate structure of inventory levels can avoid the problems of enterprise related to their management, rapidly and simultaneously respond to sudden changing demands of the market, whereas the lack of flexibility is reflected in increased costs and reduced competitiveness. [4]

3   METHODS OF REPLENISHMENT OF THE INVENTORIES

Information about the specific requirement initiate to movement of material flow, which is implemented as a causal process of decrease and restocking. In connection with this fact, the replenishment process and inventory decrease are realized as follows:
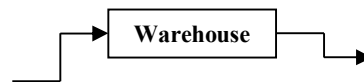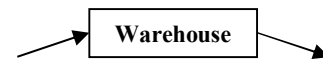
- gradual replenishment - continuous decrease
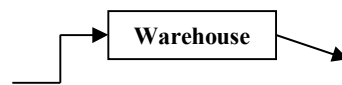
- continuous replenishment - gradual decrease
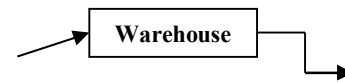
- gradual replenishment - gradual decrease

- continuous replenishment - continuous decrease. [5]

4   SIMPLE STRATEGIES OF INVENTORY MANAGEMENT

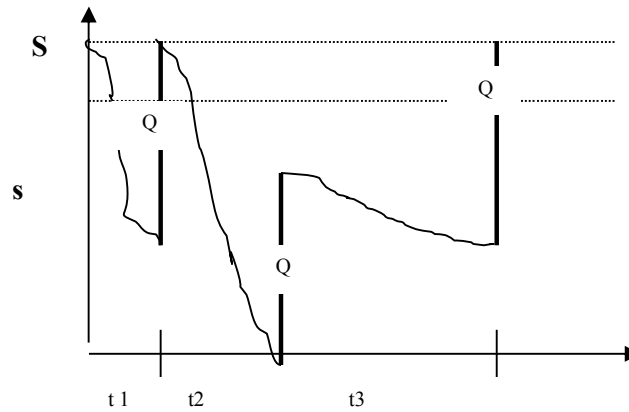### 4.1. S, S – STRATEGY OF INVENTORY MANAGEMENT

Strategy with free ordering deadlines, where a signal to replenish stocks is posted at the moment when available stock falls below a predetermined level. Size of the order is given by the difference (S-s), the order size is variable with free ordering deadlines (both variables are changeable).
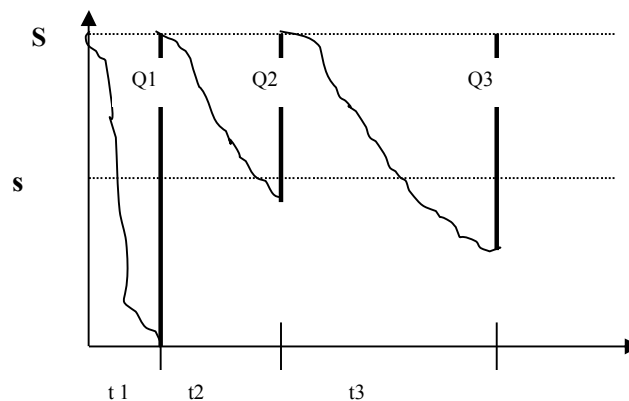
Fig. 1 s, S – Strategy of inventory management [6]
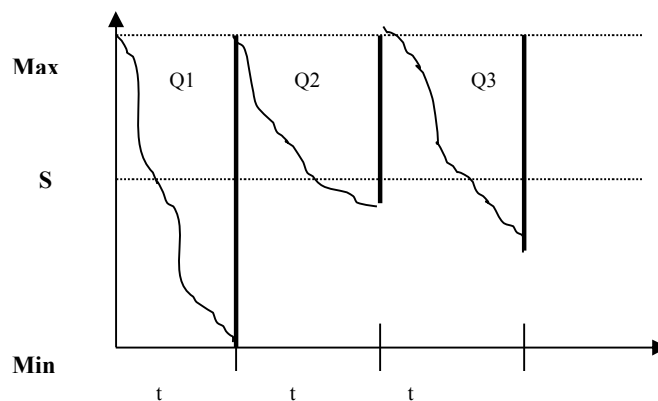
4.2. S, Q – STRATEGY OF INVENTORY MANAGEMENT

Applies where the customer-supplier relationships provide for longer planning period to determine the amount of each type of taken off stocks as a constant quantity. In practice, the signal level is determined by one or a group of stocks in the warehouse, and every time they decline to this level takes place a new order. It follows that the time of the orders and the duration of delivery cycles are determined according to the consumption of the stock, and are therefore characterized as variables.

Fig.2 s, q – Strategy of inventory management [6]

4.3. T, S - STRATEGY OF INVENTORY MANAGEMENT

Strategy is based on a pre-planned a constant length of the delivery cycle - fixed ordering deadlines that are regularly repeated after a time interval t, where the orders are immediately replenishing stocks according to available state and size of the stock level (s). Individual variations in the size of the consumption of inventories, which arise from the difference between the plan and the fact, that there is compensated by changing the size of the ordered quantity of reserves. This inventory control policy is predominant. [6]
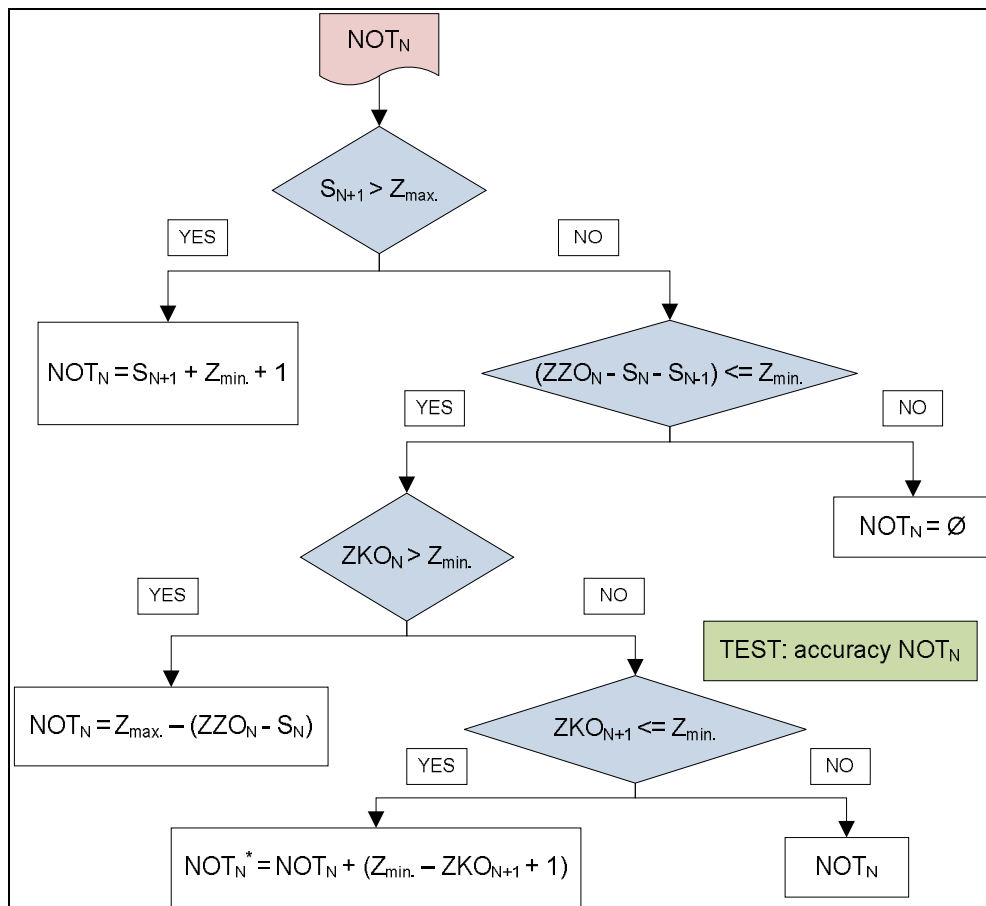

Fig.3 t, S - Strategy of inventory management [6]

But all these strategies of inventory management are based on the fact that the size of orders replenish inventory at the required set maximum levels without examining other subsequent events, i.e., it does not examine the nearest future consumption, which is known at the time of ordering, inventory balance in the coming period and its comparison with the minimum level at a given delivery cycle.

5 ADJUSTED INVENTIRY MANAGEMENT SYSTEM OF LEVELS OF STRATEGIC GOODS

This proposed adjusted inventory management system of levels of strategic goods is intended to design the order of strategic inventories, i.e. for urgent inventories which level has to be kept above the minimum. Adjusted system compared to the system described above when making the order inter alia, shall consider:

a. whether consumption in next period (S_{N+1}), which is known at the time of ordering, is not more than the maximum level of inventories (Z max.),

b. whether stocks level at the end of period week (ZKO_{N+1}) after the order at the time of N and after consumption of N+1 is not less than the minimum level of inventories (Z min.).

Fig.4 Adjusted inventory management system of levels of strategic goods
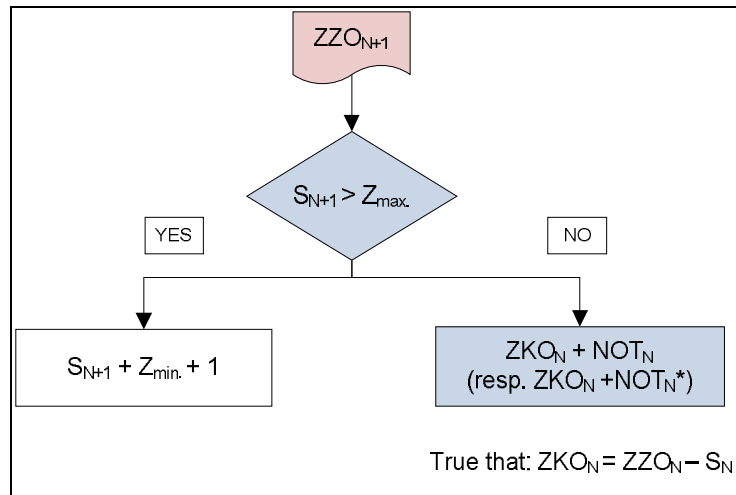
Fig.5 Determination of the stock at the beginning of the next period

Where:

NOT_N - order in period N

NOT_N* - adjusted order in period N

S_N - consumption in period N

S_{N+1} - consumption in period N+1

S_{N-1} - consumption in period N-1

ZZO_N - stock levels at the beginning of the period N

ZZO_{N+1} - stock levels at the beginning of the period N+1

ZKO_N - stock levels at the end of the period N

ZKO_{N+1} - stock levels at the end of the period N+1

Z max - maximum level of inventories

Z min - minimum level of inventories

The system initially compares future consumption (N+1) with the maximum level of inventories (Z max). If the S_{N+1} is more than Z max, the system suggests order for the period (NOT_N) so that the stock at the end of the period is at least a minimum (Z min + 1).

If the S_{N+1} is less than Z max, the system compares whether the stock levels at the beginning of the period of N after the consumption in the period N and N+1 is not less than Z min. If it is smaller, does not propose order (NOT N = 0), otherwise it compares whether the stock levels at the end of the period N is more than Z min. If so, the system suggests a stock as the difference between the maximum level of inventories and stocks at the end of the period N (ZKO_N), which is equal to the difference in stocks at the beginning in the period N and consumption in the period N.

If the stock levels at the end of the period N is less than Z min, the system verifies the proposed order NOT_N and compares, whether stock levels at the end of the period N+1

is not less than Z min., if so takes this into account and proposes readjusted order NOT $_N$ * such that ZKO $_{N+1}$ is at least Z min +1.

6 CONCLUSIONS

Proposed adjusted system ensures that stocks were at least (resp. does not fall below minimum) not only at the end of the reporting period, but neither at the end of the nearest future period. The benefit of the system is its potential use in company in process of supply of those types of products, which balance on the stock in sufficient quantities is for example subject of the contract, or is vitally important.

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