ABSTRACT

The thesis is presented in 81 pages. It contains 1 appendix and bibliography of 22 references. 18 figures and 2 tables are given in the thesis.

Topic relevance. The task of inventory management occurs when you create a stock of material resources or commodities to meet demand in a given time interval. To ensure continuous and efficient functioning of almost any organization requires the creation of reserves. Retailers are characterized by a wide range of products, which significantly complicates management of the stock of each product.

Today, the majority of trading networks of Ukraine manually perform formation of the orders to the supplier and managing a number of goods that are kept in the warehouse or in the store. They rely on experience of workers and heuristic methods. The other part uses software that predicts demand, and a Manager, depending on the received forecast, makes the decision. Because in our time are increasingly faced with the task quickly to get rid of excess goods, reduce lost sales and increase inventory turnover, it is important to develop systems which will conveniently and clearly to manage inventory and achieve their goals.

Thesis connection to scientific programs, plans, and topics. The thesis was prepared according to the scientific research plan of the Applied Mathematics Department of the National Technical University of Ukraine "Kyiv Polytechnic Institute."

Research goal and objectives. The aim of the thesis is developing methods and algorithms of inventory control and orders system in support of decision making for retailers.

To achieve this goal the following tasks were completed:

– explore the market of systems having functionality for inventory management;

– consider the methods used in danni region;

– propose a method to implement and develop its modification for low- turnover goods;

– show the effectiveness of the modified method;

– develop software using the selected algorithm;

– test the software and analysis results.

Object of research is systems for inventory management and processes of making orders.

Subject of research is models and methods for inventory management in supermarkets.

Methods of research. To solve the task, the following methods were used: methods of theory of constraints (to develop a method of response to demand); methods of probability theory and mathematical statistics (to develop a method of calculating target stock); methods of the theory of algorithms and programming (for software implementations of developed algorithms).

Scientific contribution consists of the following:

– methods of the theory of constraints are enhanced to calculate the desired stock of goods and the dynamic response to the demand for low-turnover position.

Practical value of obtained results. Methods are proposed that can be used to calculate the amount of daily deposits of all levels of the distribution system products. Developed methods, mathematical and software make possible an efficient inventory management under conditions of high instability of consumer demand, promote the rapid reduction of stocks of the enterprise, while maintaining the level of sales, thereby increasing the turnover of capital, increase the transparency of management operations.

Approbation of the thesis results. Basic ideas and results of the research were presented at the 18-th International conference System analysis and information technologies "(SAIT-2016) and at the VII conference of young scientists "Applied mathematics and computing (PMK-2016).

Publications. Thesis results are published in 2 scientific works: in the abstracts of scientific conferences, one of which is international.

Keywords: inventory management, automatic order, theory of constraints, dynamic buffer management, overstock, lost sales, turnover.