

**Kyiv National University of Trade and Economics
Management Department**

FINAL QUALIFYING PAPER

on the topic:

«Inventory management at the trade enterprise»
(by the materials of «FRUIT IMPORT UKRAINE» LLC, Kyiv)

Student of the 2^d year, group 5am
specialty
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Kyiv 2019

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INTRODUCTION

Thematic justification. The allocation of resource is a common issue to all organisations. Organisations have to acquire, allocate and control the factors of production which are necessary for the achievement of the business's objectives. Inventory management as one of the key activities of business logistics, has always been a major preoccupation for the company's survival and growth.

The aim of inventory management is to hold inventories at the lowest possible cost, given the objectives to ensure uninterrupted supplies for ongoing operations. When making decisions on inventory, management has to find a compromise between the different cost components, such as the costs of supplying inventory, inventory-holding costs and costs resulting from insufficient inventories.

Inventory control is the activity which organises the availability of items to the customers. It coordinates the purchasing, manufacturing and distribution functions to meet the marketing needs. This role includes the supply of current sales items, new products, consumables; spare parts, obsolescent items and all other supplies. Inventory enables a company to support the customer service, logistic or manufacturing activities in situations where purchasing or manufacturing of the items is not able to satisfy the demand. Lack of satisfaction could arise either because of the speed of purchasing or manufacturing is too protracted, or because quantities cannot be provided without stocks. Clodfelter (2003:279) adds that a good inventory control system offers the following benefits:

a. The proper relationship between sales and inventory can better be well maintained. Without inventory control procedures in place, the store or department can become overstocked or understocked.

b. Inventory control systems provide a business with information needed to take markdowns by identifying slow-selling merchandise. Discovering such items early in the season will allow a business to reduce prices or make a change in marketing strategy before consumer demand completely disappears.

c. Merchandise control systems allow buyers to identify best-sellers early enough in the season so that re-orders can be placed to increase total sales for the store or department.

d. Merchandise shortages and shrinkage, can be identified using inventory control systems. Excessive shrinkage will indicate that more effective merchandising controls need to be implemented to reduce employee theft or shoplifting.

Inventory is one area of logistics that has received a great deal of management attention over the past decade. Executives now realise that holding excessive stocks is simply too expensive. Therefore, a great deal of effort has been expended to eliminate unnecessary inventory without compromising customer service. However, there are numerous situations where inventory simply must be held, particularly when meeting the needs of global customers. Management's goal should be to hold only what is necessary to satisfy customer requirements and manage it effectively.

Inventory problems preoccupy profit-making organisations and nonprofit institutions as well. Inventories are common to agriculture, manufacturers, wholesalers, retailers, hospitals, churches, prisons, zoos, universities and national, state and local governments. Indeed, inventories are also relevant to the family unit in relation to clothing, pharmaceutical products, food and so forth. This indicates how inventories are important and deserve a serious attention in order to achieve organisational objectives.

The aim of this paper is to determine the peculiarities of the inventory management formation process and identification of measures to improve it on the example of a particular enterprise.

According to the aim were identified the following tasks:

- to observe and define the economic essence of inventory, its classification and role in the enterprise;
- to review the methodical bases to form efficient inventory management and its evaluation;

- to analyze the material resources and condition of its inventory management;
- to identify and assess the efficiency of material inventory management;
- to determine management tools and measures to optimize resources inventory at the enterprises;
- to forecast the results of implemented measures at the enterprise and its evaluation.

The object of research is the process of inventory management formation and optimization on the investigated enterprise.

Subject of research is theoretical and methodical foundations of inventory management on the enterprise «FRUIT IMPORT UKRAINE» LLC.

Methods of research. The following methods were used to achieve a set aim and tasks in process of writing the paper: grouping and comparisons of indicators in performance of horizontal and vertical analysis; calculation the values of deviations for years and building of comparative analytical tables; generalization, graphic method for visual reflection of the results of the analysis and others. The information base was presented by domestic and foreign publications, the press materials, Internet electronic sources and vital information of «FRUIT IMPORT UKRAINE» LLC activity.

Scientific novelty of the received results. The results of scientific investigation in the aggregate show the important issue – the scientific justification and enterprise's improvement of inventory management to increase production efficiency and improve overall position of the enterprise. The practical significance of the results is that the implementation of the recommendations that were developed in the process of writing the paper improves the efficiency of «FRUIT IMPORT UKRAINE» LLC.

Some results of the research were highlighted in a scientific paper (Appendix A). Final qualifying paper consists of an introduction, three chapters, conclusions, bibliography with 53 sources and appendixes. The total volume of the paper is 53 pages of main text with 5 figures, 15 tables, 3 appendixes.

PART 1
THEORETICAL AND METHODOLOGICAL BASIS OF INVENTORY
MANAGEMENT AT THE ENTERPRISE

1.1. The economic essence of inventory, its classification and role in the enterprise

Inventory management is one of the most important business processes during the operation of a manufacturing or production company as it relates to purchases, sales and logistic activities. It is concerned with the control of stocks throughout the whole supply chain. Inventory control sits at the data level where the day-to-day business is organized. Activities here are data driven and are primarily concerned with short-term planning and recording of events. Inventory control is concerned with maintaining the correct level of stock and recording its movement.

According to [11], inventory management refers to all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials (work-in-progress) and finished goods so that adequate supplies are available and the costs of over or under stocks are low. Inventories are essential for keeping the production wheels moving, keep the market going and the distribution system intact. They serve as lubrication and spring for the production and distribution systems of organizations.

Inventory is essential to organization for production activities, maintenance of plant and machinery as well as other operational requirements. This results in tying up of money or capital which could have been used more productively. The management of an organization becomes very concerned if inventory stocks are high. This therefore calls for its close scrutiny by management. Management is very critical about any shortage of inventory items required for production. Any increase in the redundancy of machinery or operations due to shortages of inventory may lead to production loss and its associated costs.

The essence of inventory management is to augment business operations so as to ensure effective flow of goods, products, and services [5]. In this context, ‘inventory’ is the aggregate list of items; a quantity of goods in stock or stock of the product which an organization is producing for sale and the components that make the sale. ‘Stock’ consists of a wide range of goods or materials – stationery, office equipment, plant, machinery, consumables, etc. available for use or sale.

Inventory can be classified into three types which include:

– *Raw material inventory*: This includes all items purchased by an organization for processing. For instance, Flour, yeast, eggs etc. are all part of raw materials inventory of a confectionary organization.

– *Work-In-Progress Inventory*: This is an intermediate stage of raw material inventory that is yet to be finished by the plant to enter into another stage of processing. These are materials that have been partly processed but are yet uncompleted.

– *Finished Goods Inventory*: This is the stock of finished goods. These could be stock of goods awaiting shipment or in the warehouse, the level of finished goods stock is a matter of co-ordination between the production and sales departments of the organization.

Inventory Management is responsible for planning and controlling inventory from the raw material stage to the customer. Inventory management is not only concern with aggregate or overall inventory management but also individual item levels too.

As firm’s product could not be supplied instantaneously to meet the demand, therefore the need for inventory storage arises. Firms use inventory to improve supplydemand coordination and to lower overall costs. As it is impractical and impossible to know future demand with certainty and because the availability of supplies cannot be guaranteed at any given moment, inventories are accumulated to assure an availability of goods and to minimize the overall costs of producing and distribution the goods.

The purposes of using inventory are shown in Table 1.1.

Table 1.1

The six purposes of using inventory

Purpose of using inventories	Explanation
Improve Customer Service	Having inventories will ensure that customer who desire or must have immediate stock availability or short delivery times are satisfied in their dealing with the firm. This measure assists the marketing department and specifically the level of customer service to the customers
Encourage Production Economies	Items purchased or manufactured in quantities greater than what is needed immediately will create lot-size inventories. This is to take advantage of quantity discounts, to reduce shipping, clerical, setup costs and in some cases, where it is impossible to make or purchase items at the same rate it will be used or sold
Permit Purchase and Transportation Economies	Inventory acts as buffer between demand and supply so that production can be geared to a more constant output than fluctuating demand. Therefore, lowest per-unit cost is possible due to the fact that production runs at a constant quantity. Inventory will also allow the seizure of lower per-unit rates of fullvehicle-load quantities. Likewise, lower prices can also be realized from price-quantity discount offer as more can be purchased and inventoried
Act as Hedge against Price Changes	Goods that are purchased on the open market are subject to the price level s dictated by changing supply-demand pattern. Purchases may be made in advance of need because of anticipated price increases
Protect against Uncertainties in Demand and Lead Time	In most cases, the level of demand on a logistics system and the time required for re-supply cannot be known for sure. To assure product availability, additional amounts of stock are maintained. These stocks are in addition to the regular stock to meet production and marketplace needs
Act as a Hedge against Contingencies	Labour strikes, fire and floods are just a few of the contingencies that can happen. Therefore, maintaining backup inventories is one way in which normal supplies can be maintained for a period of time

Made on the basis of [12; 17; 43]

In order to deal with the challenges of controlling inventory levels, breaking inventories into various classification due to the nature of demand for the inventories. The various types of inventory demands are shown in Table 1.2.

These features are basic to inventory management whether these inventories are raw materials, work-in-progress goods or finished products. These features are the relevant costs associated to inventory, inventory objectives and forecasting the uncertainties. Understanding these features will assist in implementing control over inventories.

Inventory costs are important for three major reasons:

- a. First, inventory costs represent a significant component of total logistics cost in many companies.
- b. Second, the inventory levels that a firm maintains at points in its logistics system will affect the level of service the firm can provide to its customers.
- c. Third, cost trade-off decisions in logistics frequently depend upon and ultimately affect inventory carrying costs.

Table 1.2

Types of Inventory Demand

Types of Inventory Demand	Explanation
Perpetual Demand	Require continual or period replenishment. Deals with products that have a significant demand for a very long period of time. Inventory management is directed as forecasting the level of demand that will occur for each item when and quantity of stocks to be replenished
Seasonal Demand	May involve products that are demanded at certain period of the year or require accurate forecasting the level of demand that will occur
Lumpy Demand	This type of demand will occur due to drastic environment or lifestyle change. It is quite difficult to predict quite accurately of the coming demand trend. Close monitoring of the erratic or lumpy demand with slow response in product replenishment
Terminating Demand	This is more of a planned preparation. Demand will decline and excessive inventories can be worked out slowly. The focus of the planning is when and how much should be stocked during each period (week, month or year) with preparation towards the termination period specified
Derived Demand	The demand for this category of products is derived from the final consumer market. How much and when to order or produce can be accurately determined from monitoring the demand for finished products

Made on the basis of [14; 21]

Different cost categories will be involved when managing inventories. Understanding these costs is important especially when making inventory policy decisions. The major types are inventory carrying cost, order/setup cost, carrying cost versus order cost, expected stockout cost and in-transit inventory carrying costs as shown in Table 1.3.

A firm wishing to maximize profits will have at least the following objectives, which are maximum customer service, low-cost plant operation or

minimum inventory investment. Customer service is the ability of a company to satisfy the needs of customers through the availability of items when needed and is a measure of inventory management effectiveness. Inventories help to maximize customer service by protecting against uncertainties. If the exact forecast on what customers want and when, their demand can be fulfilled without any uncertainty.

Table 1.3

Types of Inventory Costs

Types of Inventory Costs	Explanation
Inventory Carrying Costs	Capital cost, storage space cost, inventory service cost and inventory risk costs are components of inventory carrying costs
Order/ Setup Costs	Order costs refer to the activities associated with placing and receiving orders that could affect cost. While setup costs refer to the expenses each time a company modifies a production line to produce a different item for inventory. It is essential to separate the fixed and variable costs of both order and setup costs with the emphasis on the variable costs
Expected Stockout Costs	This cost refer to the cost of not having product available when a customer demands or needs it. If customer turns to competitor product, the possibility of losing a customer on long-term basis might occur
In-transit Inventory carrying Costs	The title F.O.B products is transferred only when the product reaches the customer. To consider the trade-off between higher cost of fast delivery versus the cost of the product in transit

Made on the basis of [22]

Inventory help to make a manufacturing operation more productive in allowing operations with different rates of production to operate separately and more economically. Inventories also allow manufacturing to run longer production. This will certainly result in lower setup costs per item, increase in production capacity, larger quantity purchases and provide stocks for peak periods.

Inventory investment should also be balanced with customer service, cost associated with changing production levels, cost of placing orders and transportation costs. The benefit of carrying inventories should exceed the costs of carrying the inventories or else the purpose of carrying inventories is useless.

Economically, the importance of warehouse storage is because it creates time utility for raw materials, industrial goods and finished products. The proximity of market-oriented warehouse to the customer allows a firm to serve the

customer within a shorter lead-time period. Basically, the products are available according to when and where the customer's demand is.

By warehousing some inventories, a firm can lower its production costs by avoiding wide fluctuations in outputs levels due to the uncertainties and variations in supply and demand patterns. It can also lower transportation costs through larger and economical quantities shipments. Table 1.4 shows basic reasons for warehouse storage requirements.

Table 1.4

Basic Reasons for Warehouse Storage Requirements

Basic Reasons for Warehouse Storage Requirements	Explanation
Transportation-Production-Cost Reduction	Products originate from many sources. By stocking inventories, the supplying and distributing transportation and production costs will be lowered
Coordination of Supply and Demand	For highly seasonal production coupled with constant demand for products. Warehousing is highly needed to coordinate supply and demand and to avoid excessive costs incurred due to production and transportation
Production Needs	For products that needs to be stored for a certain period before consumption period begins for example, cheese
Marketing Considerations	Fast delivery that can satisfy customers requires stock availability through stocking in warehouse

Made on the basis of [47-49]

Operating a warehouse involves several processing activities and the efficient operation of the warehouse depends upon how well there are performed. The activities performed are presented in the Table 1.5.

Table 1.5

Warehouse Activities

Warehouse Activities	Explanation
Receive goods	the warehouse accepts goods from outside transportation or an attached factory and accepts responsibility for them. This means that the warehouse must check goods against an order and the bill of lading, check the quantities, check for damage and fill out damage report if necessary and inspect goods if required
Identify the goods	items are identified with the appropriate stock-keeping unit (SKU) number and the quantity received recorded
Dispatch goods to storage	where goods are sorted and stored away
Hold goods	where goods are kept in storage and under proper protection until needed

Continuation of the Table 1.5

Pick goods	items required from stock must be selected from storage and brought to a marshalling area
Marshal the shipment	where goods making up a single order are bought together and checked for omissions or errors. Order records are updated
Dispatch the shipment	where the orders are packaged, shipping documents prepared and goods loaded on the right vehicle
Operate an information system	a record must be maintained for each item in stock showing the quantity on hand, quantity received, quantity issued and location in the warehouse

Made on the basis of [32-33]

The complexity of managing a warehouse very much depends on the number of SKUs handled, the quantities of each SKU, the number of orders received and filled. In order to maximize the use of space available in floor space and above the floor and the effective use of labour and equipment through good location system and layout moving goods efficiently.

1.2. Methodical bases to form efficient inventory management and its evaluation

Among the models of logistic management of enterprise stocks distinguish deterministic and stochastic models. The easiest and oldest of stock patterns is the deterministic model for determining the cost-effective (cost-effective) order quantity (*EOQ*-model). The stochastic models of inventory management – (*r, q*)-model and (*s, S*)-model, which require constant monitoring of stock levels, and their alternative (*R, S*)-model, which involves the use of periodic policies review of the main stock [25].

When dealing with practical issues of managing inventory of trade networks, the use of deterministic descriptions of real inventory management systems can rarely produce the desired results. The question of «sufficient accuracy» of deterministic models can be solved only by going beyond the class of deterministic models based on the use of simulation: discrete-event, system-dynamical, agent models.

In the framework of this research the problem of modeling of product flows of trade networks on the basis of the system dynamics method is considered. The management of commodity flows of trade networks, in particular commodity stocks, has a significant impact on the efficiency of the functioning of the logistics systems of the subjects of the market. On the one hand, a shortage of products can lead to large losses or loss of market share; on the other hand, the over-saturation of stockpiles leads to their deterioration and inefficiency investment of working capital of the enterprise. Managing a commodity flow in the form of a stock means always being able to meet the needs of customers, consumers and supplies. If inventory management is carried out in accordance with these requirements, then such management should be considered rational [31].

The ultimate goal of modeling various strategies for managing the stockpile of trade networks is to create such a system, the use of which will minimize the company's total costs (chain of retail trade points) for inventory management, provided that it fully satisfies the consumer demand for the enterprise products.

The simulation model consists in conducting numerical experiments with a mathematical model describing the behavior of a complex system during the time periods of a given duration. Thus, when managing the product flows of the trade network, it is more expedient to develop a simulation model of inventory management.

In the simulation model, the following assumptions and limitations were adopted:

- 1) products are measured not in natural but in conditional units (used in accounting for goods that satisfy one and the same need);
- 2) the following costs are taken into account: the cost of ordering and organizing the supply of products, the cost of storing stocks, the cost of the deficit, the total cost of inventory management. Other types of costs, of course, exist, but will not undergo significant changes as a result of variations in management variables [44].

The calculation of the values used in the simulation will be presented in the form of difference equations.

The offered model of system dynamics includes two submodels: a submodel of commodity flows and a submodel of account of expenses of the trade organization.

When constructing system-dynamic models, the following elements are distinguished:

- 1) model levels are cumulative values;
- 2) rate of flows are used to calculate the intensity of incoming and outgoing movements (flows) between levels;
- 3) control of flows and initial values of levels is carried out with the help of decision functions, in the concepts of system dynamics, they are present as «pre-intermediate variables»;
- 4) fixed values, which are given in the form of constants.

Level of available stock [7]:

$$I(t+1) = I(t) + Ps(t) - Pr(t), \quad (1.1)$$

where $I(t)$, $I(t+1)$ – the level of available stock of products at the beginning of the reporting period t and $(t+1)$ respectively, pcs.; $Ps(t)$ – intensity of supplies, pcs / day; $Pr(t)$ – intensity of product sales, pcs / day.

Stock levels of products that are on the way [18]:

$$Id(t+1) = Id(t) + Pv(t) - Ps(t), \quad (1.2)$$

where $Id(t)$, $Id(t+1)$ – the level of stock of products that is on the way at the beginning of the reporting period t and $(t+1)$ respectively, pcs.; $Pv(t)$ is the intensity of sending products from the central warehouse, pcs / day.

Accumulated volume of product sales [14]:

$$NPr(t+1) = NPr(t) + Pr(t), \quad (1.3)$$

where $NPr(t)$, $NPr(t+1)$ – the level of stock of products, which is on the way at the beginning of the reporting period t and $(t+1)$ respectively, pcs.

Planned Order Delay – Subsidiary – is used to calculate the date of the next scheduled order in case of an unscheduled order [44]:

$$dT(t+1) = dT(t) + idT(t) - rdT(t), \quad (1.4)$$

where $dT(t)$, $dT(t+1)$ – the value of the scheduled order delay of products, days; $idT(t)$ – occurrence of delay, days; $rdT(t)$ – removal of delay, days.

Next step is to formulate the equation for calculating the values of the rates and other variables of the model.

First of all, it is necessary to calculate the probable need for product stocks, that is, to study the characteristics of demand for products of the company. Forecasting needs can be done by time series or causal relationships. However, in order to determine the demand for products, these methods cannot be used, as the consumption of products is usually random. This consumption is associated with such a mobile category, as the demand of the population, which reacts sensitively to the least socio-economic, climatic, psychological and other changes.

In case of accidental demand for products, it is necessary to choose the theoretical curve (function) of the distribution of the studied trait on the basis of the empirical distribution of the distribution. In stock management theory, the Poisson density function, which is inclined to the left, can be applied to the description of products with infrequent demand. For the description of the same products with frequent demand, usually a normal distribution is used [36].

If the demand for products of the enterprise corresponds to the normal distribution, which is most probable, then the initial data of the simulation model inventory management will be two parameters of the normal distribution law – the average daily demand for products (mathematical expectation) and its mean square deviation.

In order to maximally meet consumer demand and prevent the shortage of goods, it is necessary to constantly monitor the level of stocks for each group of products. Therefore, in the proposed model, the process of continuous monitoring of stock status is implemented, which is based on two specified parameters - order point and order size.

The ordering point is the lower limit of the stock, at which point it is necessary to promptly place an extraordinary order for delivery [29].

Critical level of product stock (point of order) [29]:

$$s(t) = L \times MD + SS_L, \quad (1.5)$$

where s is the order point (the minimum allowable level of stock); L – the term of the order; MD – average daily demand for products; SS_L is the value of the insurance stock for the period of execution of the order L .

In the case of a normally distributed demand, 68.27% of all events fall into the range of ± 1 mean square deviation (MSD). This means that in 68.27% of all days of the period, the sales volume is equal to the average value of ± 1 MSD. The interval ± 2 MSD covers 95.45% of all events, and the interval ± 3 MSD – 99.73% of events. The value of MSD makes it possible to calculate the amount of insurance reserves that protect against a deficit under the unchanged law of variation in demand.

The amount of the reserve stock depends on the level of service and in the case of normally distributed demand is calculated according to the following formula [42]:

$$SS_L(t) = Z \times SD \times \sqrt{L}, \quad (1.6)$$

where Z is the number of mean square deviations, which is determined based on the required level of service.

During the continuous operational control of stocks, the available margin of each type of product is compared to the order point. If the available stock is less than the established order point, then a new (unscheduled) order to replenish the stock of products will be made as a result of the control [10].

In this case, the system analyzes the available inventory and places an unscheduled order on the quantity of products that will bring the stock to the target level.

Target inventory can be determined as follows [10]:

$$S(t) = (T + T') \times MD + SS_{T+T'}, \quad (1.7)$$

where T is the period between scheduled orders; T' – the number of days remaining until the scheduled purchase order; $SS_{T+T'}$ is the value of the insurance stock for the period of time $(T+T')$.

This imitation model of inventory control of a trade organization is a model of management in the conditions of uncertainty of demand for products (demand is a randomly distributed normal value) that implements the following strategy: if the stock of any product reaches the critical level $s(t)$ for T' days before the scheduled ordering products, an unscheduled order is made for the supply of all kinds of products of such volume that there is no need to make the current plan order. Amount of $Q(t)$ unscheduled order should provide consumer demand for products until the next scheduled order.

In the event that the stock of any goods did not reach a critical level before the scheduled time of the scheduled time, according to the plan, the current procurement order for the delivery of all types of products is carried out in volume, which will bring the available margin for each type of product to the target level.

An order for a product is not made only if the level of its stock is equal to the target, that is, no unit of output of a certain type is sold [37].

Graphic representation of the submodel of total logistics costs calculation of the company illustrates the Fig. 1.1.

The developed simulation model of system dynamics involves the calculation of the following costs of inventory management [31]:

$$C_p = N \times C_f + \sum_{i=1}^n N z_i \times C_{pi}, \quad (1.8)$$

$$C_h = \sum_{t=1}^{TT} \sum_{i=1}^n I_{it} \times C_{hi}, \quad (1.9)$$

$$C_{def} = \sum_{t=1}^{TT} \sum_{i=1}^n Def_{it} \times C_{defi}, \quad (1.10)$$

$$C = C_p + C_h + C_{def}, \quad (1.11)$$

where C_p , C_h , C_{def} , C – respectively, the cost of ordering and arranging the delivery of products, storage costs, costs due to the deficit, total inventory management costs; TT – period of modeling; N – total number of product orders during the TT period; C_f – fixed costs for ordering and arranging the delivery (not depending on the volume and range of the supply of products); $N z_i$ – the number of

orders for the i -th type of products during the TT period, $i = 1, n$; C_{pi} – variable costs for the order and delivery of the i -th type of products, $i = 1, n$; I_{it} – the level of stock of products of the i -th type at the beginning of the t -day, $i = 1, n$; $t = 1, TT$; C_{hi} – daily expenses for storage of the unit of products i -th type, $i = 1, n$; Def_{it} – the magnitude of the deficiency of the i -th type of products in the t -day, $i = 1, n$; $t = 1, TT$; C_{defi} – costs due to the deficit per unit of products of the i -th type over a unit of time, $i = 1, n$.

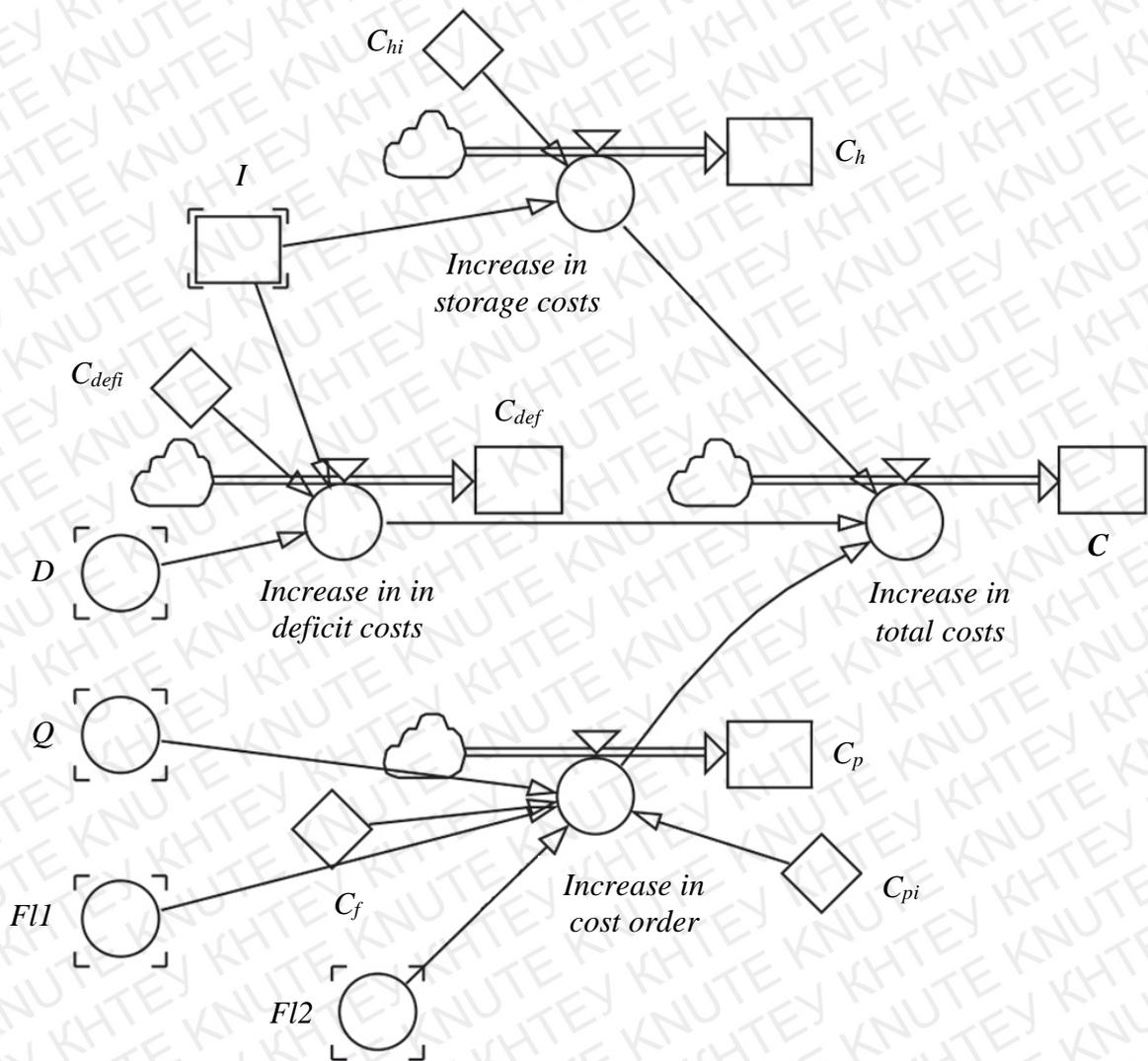


Fig. 1.1. Appearance of the logistics costs submodel of the company

Made on the basis of [32-33]

For inventory management, the model uses three variables: the period between the scheduled orders T , the order point s , and the target stock S . The

values of s and S are determined analytically by formulas (1.8) and (1.11), based on the characteristics of demand for products, the desired level of service, the duration of the order, as well as the interval between scheduled orders.

Fig. 1.2 shows the dynamics of changes in the key indicators of the model during the quarterly period (90 days), as well as logistics costs for the maintenance of inventories, both in total size and in terms of components.

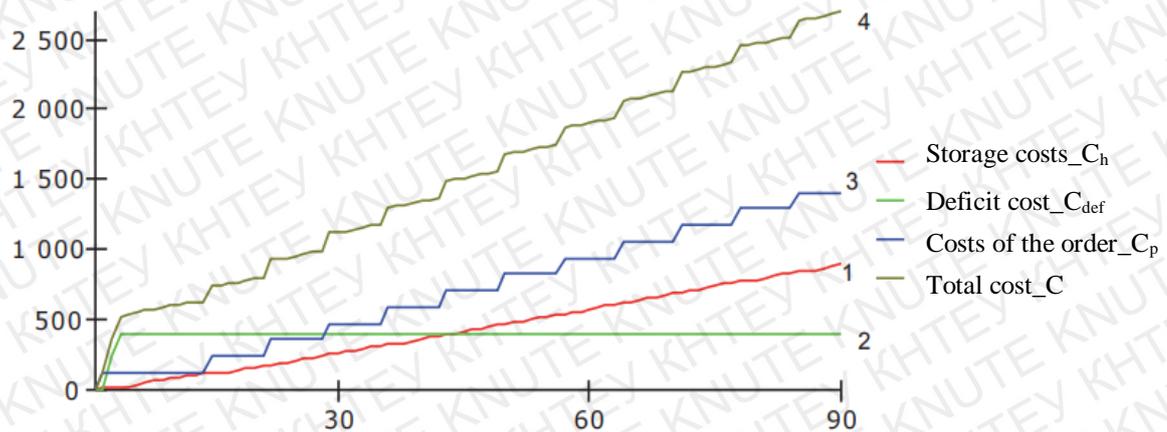


Fig. 1.2. Dynamics of logistics costs of the company (1 – storage costs, 2 – the cost of the deficit, 3 – the cost of the order, 4 – the total cost)

Built on the basis of Fig. 1.1

Therefore, in order to determine the most optimal inventory management strategy that is characterized by minimal total inventory management costs, it is necessary to run a model for different values of the management variables, in particular the timing between scheduled orders T , and to determine the dependence of these costs on the T control variable, which will allow for prediction. Expected total costs at different values of the managing variable, taking into account the constraints on the capabilities of the warehouse.

PART 2

DIAGNOSTICS OF THE INVENTORY MANAGEMENT AT «FRUIT IMPORT UKRAINE» LLC

2.1. Material resources and condition of its inventory management

Procurement work is the basis of business activity in trade. Since it essentially starts a commercial activity. To sell the goods to the buyer (consumer) and to get profit it's necessary to have (possess) a commodity. The main function of commodity circulation is reduced to a change of the form of value according to the formula «money – commodity – money». The formula reveals the essence of commercial work in trade – a businessman, having a certain amount of money buys goods, which then sells to get cash with an increment (profit). Based on the basic function of commodity circulation, it can be concluded that the commercial work in the trade begins with the procurement of goods for the purpose of their subsequent sale.

According to the economic nature, procurement is a wholesale and small wholesale turnover, carried out by trade companies (legal persons) or individuals with a view to resale purchased goods.

Properly organized wholesale purchases make it possible to develop the necessary range of goods to supply the population or retail network, to carry out the impact on producers of goods in accordance with customer demand, ensure efficient operation of commercial enterprise.

Commercial work on wholesale purchases of goods in «FRUIT IMPORT UKRAINE» LLC consists of the following stages:

1. Study and forecasting of consumer demand.
2. Identification and study of the sources of supply of goods and suppliers.
3. Organization of rational economic relations with suppliers of goods, including the development and signing of supply contracts, performance of orders to suppliers.

4. Organization and technology of purchases directly from producers, intermediaries, on commodity exchanges, auctions, from importers and other suppliers.

5. The control and account for wholesale purchases.

Study and forecasting of consumer demand is a necessary marketing condition of the successful commercial operation of the procurement of goods. Marketing science has developed an arsenal of tools and methods for the study and forecasting of consumer demand to be used in the organization of the wholesale purchase of goods. Therefore, wholesale purchases should begin with a study of the demand, the needs of customers for products, purchasing intentions and other factors shaping demand.

To carry out the work on the study and forecasting of demand of «FRUIT IMPORT UKRAINE» LLC there are marketing services (departments), one of the main functions of which is to study the total volume of demand (market capacity) and intra-group structure of demand for the purchased goods.

For the successful implementation of commercial operations for procurement of goods enterprise should systematically deal with the identification and study of the sources of procurement of goods and suppliers. Commercial workers must be familiar with their economic area and natural resources, industry, agriculture, production capacity and assortment of products produced by industrial enterprises. Each month «FRUIT IMPORT UKRAINE» LLC carries out synergies and study for commercial workers in this direction.

Commercial employees attend manufacturing enterprises (suppliers, manufacturers) to get acquainted with the production capacity of the enterprise, the volume and quality of production and also participate in meetings with the workers of industry, exhibitions and screenings of new types of products, wholesale fairs.

Commercial workers constantly monitor the advertisements in newspapers and magazines, special press, stock information, brochures, catalogs. Formation of commodity resources is a constant work of company vending machine. In market conditions the forms and methods of this work have changed dramatically.

Consequently, the economic ties with suppliers of goods are established, primarily direct and long-term contractual relationships, allowing to buy goods directly from manufacturers on a stable long-term basis.

At the «FRUIT IMPORT UKRAINE» LLC in the organization and planning of procurement are involved department managers. The organization of the procurement process at «FRUIT IMPORT UKRAINE» LLC has certain stages:

1. Determining the need for material resources.
2. Determining the desired characteristics and quantity of goods and services.
3. The analysis and identification of potential sources of supply.
4. Determination of prices and purchasing conditions.
5. Preparation and placement of purchase orders.
6. Control of execution of the order and / or forwarding.
7. Acceptance and testing of goods.
8. Invoice processing and payment.
9. Accounting the income of material resources.

Every purchase begins with a determination of the total needs of the company and the individual needs of each of its divisions. With this information, the enterprise can get the material resources from the warehouse or by moving surplus of goods from another division or buying new products. «FRUIT IMPORT UKRAINE» LLC has its own software for following the stocks of each division, also there is a logistic center in Boryspil that keeps goods for «FRUIT IMPORT UKRAINE» LLC and when it is needed supply them to the divisions.

It is needed to have an accurate description of the requirements, articles of good or service that is requested. To this end, the purchasing department carry a list (directory) of constantly procured items, which contributes to maintaining proper accounting procedure and storing them in a warehouse. Thus, the choice of the supplier is an important part of the procurement function and includes the search for sources of supply and assess the possibility of timely delivery and providing essential services before and after sale.

Among the basic information that can be stored in electronic form and in the books of account, the purchasing department has information on existing contracts with suppliers, in accordance with which the orders are placed, the commodity classification of purchased products, the register of suppliers.

Once a purchase order has been sent to the supplier, the customer monitors the progress of its implementation and / or accelerates the execution of the order. These functions are assigned to the department managers. The monitoring function of the order is a standard feature, which controls the ability of the supplier to perform its obligations under the terms of delivery. Forwarding order is a kind of pressure on the vendor to ensure that it fulfills its obligations to deliver the goods, deliver them ahead of schedule or accelerate delivery in the case behind schedule.

Unfortunately, «FRUIT IMPORT UKRAINE» LLC does not use this method of control of supply, so the department of acceptance of the goods often has disputes with suppliers who are late. As an incentive, it is used the threat of cancellation or termination of the business relationship in the future if the supplier can not meet the terms of the agreement.

An important direction in improving commodity supply of «FRUIT IMPORT UKRAINE» LLC is advanced technology of product distribution using packaging equipment. In this case, packaging equipment serves as commodity supply function during transport, storage of goods and the trading equipment in its implementation on the sales area. This technology involves the comprehensive mechanization of loading and unloading, transport and warehouse operations in all phases of product distribution and sale of goods by the method of self-service.

Using this technology will allow to:

- mechanize and speed up the loading and unloading operations;
- eliminate manual labor;
- reduce the number of units and technological operations on processing of goods in «FRUIT IMPORT UKRAINE» LLC;
- reduce the number of employees;
- increase the utilization ratio of vehicles;

- reduce the cost for containers and packaging;
- use commercial and residential buildings more efficiently;
- reduce the customers' time to purchase goods.

The essence of advanced technology of commodity supply and sale of goods is as follows: the goods are packaged in production or wholesale sector, and in consumer packaging fits into specialized packaging equipment that is delivered directly to the sales area of «FRUIT IMPORT UKRAINE» LLC or storage room.

Design features of the packaging equipment are follows:

- multi-purpose (can be used for food and non-food products);
- the ability to mount it in the shelves, baskets for easily deformable goods;
- ensuring the safety of goods;
- the possibility of horizontal transport;
- the possibility of packaging certain types on return.

Types of packaging equipment are: not folding; collapsible; folding; portable; mobile.

Packaging equipment can be used in the delivery of essential food products (bread, groceries, beer and soft drinks, wines, liquors, preserves, vegetable products and some non-food (household goods, wallpaper, sports shoes etc.). «FRUIT IMPORT UKRAINE» LLC is now used this delivery method only for bakery products and beer.

The economic effect of the delivery and sale of goods in packaging equipment represents a total savings for all resources (human labor, capital expenditures, working capital), which are received by the national economy as a result of the application of this technology.

Industry enterprises, retailers and transport enterprises also receive economic effect from the introduction of packaging equipment.

SNW-analysis is suitable for strategic analysis of the internal environment of the organization, more precisely of its strengths, weaknesses, as well as neutral or averaged evaluation of certain elements of the enterprise. It is proposed to carry out the analysis for commodity supply of «FRUIT IMPORT UKRAINE» LLC.

Table 2.1 shows the factors on which was evaluated the system of commodity supply of the enterprise.

Table 2.1

SNW-analysis of «FRUIT IMPORT UKRAINE» LLC

№	Factors	Mark		
		S	N	W
1	Organizational structure of the commodity supply system	+		
2	Availability of logistic warehouse	+		
3	Availability of own warehouse of fruits and vegetables (fresh logistics)	+		
4	Own software			+
5	Communication with departments		+	
6	Time corridors	+		
7	Working conditions	+		
8	The number of staff in the department			+
9	Labor protection	+		
10	Organization of supplies planning	+		
11	Convenience of unloading / loading	+		
12	Relationships with suppliers	+		
13	Long-term contracts	+		
14	Dependence on suppliers			+
15	Customer focus	+		
16	The speed of delivery processing and its documenting	+		
17	The level of technical equipment	+		
18	Distribution of written off goods	+		

Systematized on the basis of analytical material of «FRUIT IMPORT UKRAINE» LLC

Thus, the presence of the organizational structure of the system suggests that the commodity supply issues are resolved exclusively by professionals, that is there is no combination of professions, and in other retail chains department employees accept the goods for their departments. This ensures that all employees carry out their work efficiently.

Availability of logistic warehouse in Borispil can quickly bring the right products in the right range and quantity to «FRUIT IMPORT UKRAINE» LLC,

without waiting for confirmation of the order and delivery from the supplier, so it saves transport costs.

Even the retail network has its own warehouse of fruits and vegetables in Tarasivka, it allows «FRUIT IMPORT UKRAINE» LLC to save time and money on shipping, as in the case with logistics warehouses. The big advantage of fresh logistics is also big reduce of time expense of department employee for quality control of goods, as the warehouse of fresh logistics accepting the goods from the supplier immediately check its quality, which is very important for fresh products.

The enterprise uses in its work its own software. Scheme of information flow of «FRUIT IMPORT UKRAINE» LLC is presented on Fig. 2.1.

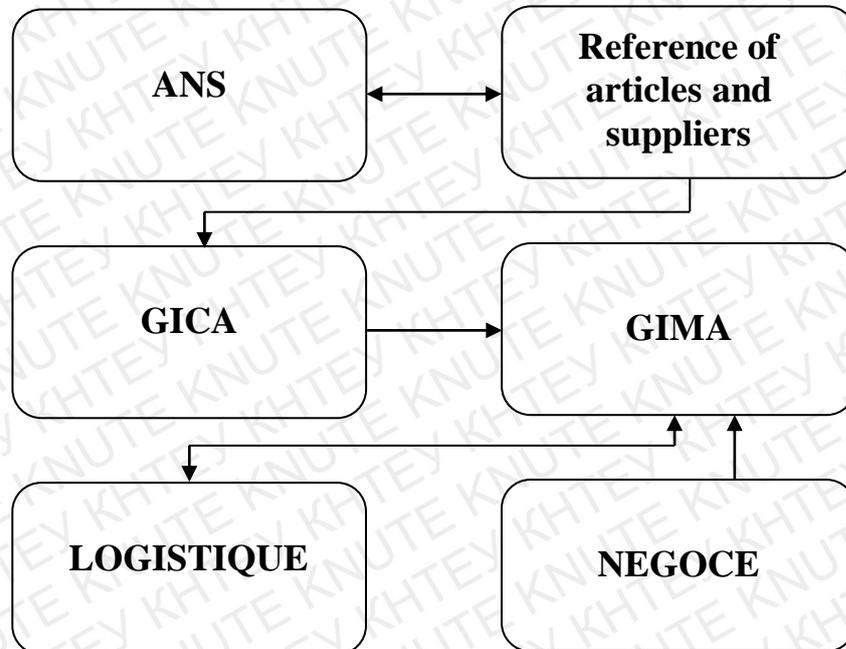


Fig. 2.1. Scheme of information flow of «FRUIT IMPORT UKRAINE» LLC

Internal documentation of «FRUIT IMPORT UKRAINE» LLC

The process of reference of articles and suppliers means codification of goods. The next is the ANS negotiating terms between «FRUIT IMPORT UKRAINE» LLC and its suppliers, where are decided all matters, created special card of goods and passed for codification. Next is GICA, Codification Division of Central Office of procurement, then is GIMA – software of «FRUIT IMPORT UKRAINE» LLC, with GIMA data moves to LOGISTIQUE – Software of hypermarkets' Logistics and return back to «FRUIT IMPORT UKRAINE» LLC.

There is NEGOCE, a program used for goods that «FRUIT IMPORT UKRAINE» LLC produces with its own production.

The presence of own software can be attributed to weaknesses of the enterprise, because it is old, outdated, does not have a continuous updating, so do not take into account changes in legislation and changes in company policy and requires constant human intervention.

Communication with the departments – it's a prerequisite for the commodity supply system. Without it, orders would be wrong, all problems with the suppliers would be solved for a long time, it would also be problems with display of goods in the sales area as well as the staff of departments would not know that the goods come into the enterprise. Therefore, this factor is neutral for the company.

Time corridors – is a huge plus for the company as they enable to suppliers carefully plan its deliveries knowing at what time the car needs to come to «FRUIT IMPORT UKRAINE» LLC to unload on time and do not stand in queue. Also the time corridors allow the enterprise to adjust the load of employees and avoid the intersection of incompatible products (eg fish and bread).

Working conditions are a strong point of the company, as «FRUIT IMPORT UKRAINE» LLC works strictly on the law, respectively, the enterprise perform the whole amount of liabilities to employees that can not always be said about other retail enterprises.

But the number of staff in the department should be attributed to the weak side of the enterprise, as there is a high turnover rate among operators. This can be explained by the fact that the job requires a high-speed document processing, the care and knowledge of the regulatory requirements.

So far as «FRUIT IMPORT UKRAINE» LLC works strictly on the law, it performs all the necessary labor protection requirements. Employees have the form, warm jackets, as well as protecting shoes to reduce the quantity of work-related injuries when working with storage devices (for example, pallet jack). This fact is undoubtedly a strong point of the company.

Proper organization of supply planning allows to work systematically and uniformly, count the required number of department employees to optimize the work and to protect against low or high functioning capacity.

Convenience of unloading / loading of the enterprise is the presence of four ramps, which are always ready to take car of any size.

Relationships with suppliers allow the enterprise to quickly solve problems and various issues related to the supply of goods. It also means that all is negotiated with the supplier.

Long-term contracts allow to optimize the sales planning and to get the desired range of goods guaranteed. Although, on the other hand, these contracts give a commitment to the volume of purchased goods.

Unfortunately, «FRUIT IMPORT UKRAINE» LLC has a dependence on suppliers, since the warehouse of the enterprise is very small, so if non-food products can be ordered from a logistics warehouse, fresh food is only delivered by suppliers. It is a weakness of the enterprise.

Customer focus – is the credo of the trade network. This allows to use in its range different products that are in demand, thereby increasing turnover and reducing inventories.

The speed of delivery processing and its documenting also applies to the strengths of the company. In the hypermarket it is high level of automation, product acceptors use scanners to speed up the acceptance of goods. Also the presence of narrow specialists influence on the work speed: acceptors only accept goods, operators draw up all documents that can handle the delivery faster.

Availability of storage equipment in the enterprise (for example, pallet jack) allows to reduce manual labor, as well as to perform a job both men and women.

The last factor of SNW-analysis indicates that the company has a social responsibility to the state. Thus, the write-off non-food products that are good, but for some reason can not be sold, are transferred to the children's communities, and food products are sent to animal shelters. This also suggests that the spoiled food will not get to the people.

It can be concluded that «FRUIT IMPORT UKRAINE» LLC has a well-established system of commodity supply, but there are some things improving of which it is possible to improve the economic ratios of the enterprise.

2.2. Efficiency assessment of material inventory management

Organization of commodity supply and economic relations start with the search and selection of suppliers. However, the feature of «FRUIT IMPORT UKRAINE» LLC in the organization of commodity supply is a presence of a long-term experience with various suppliers, the availability of stable economic relations with many of them.

In addition, the management of the enterprise has long-term experience in the study of consumer demand, knows features of contingent of buyers, features of the formation of consumer demand for certain types of goods.

Now, the organization of commodity supply in «FRUIT IMPORT UKRAINE» LLC engage department managers who:

- constantly study the demand of all groups of products and development trends;
- examine the factors influencing on the distribution of goods and that are important for successful implementation, the types of demand (stable, speculative, short-term, and others), the reasons for its increase and decrease, the differentiation of the purchasing power of the population;
- forecast demand for goods and sales volume;
- studying the prospects of sales of new products, taking into account socio-demographic characteristics of the different groups, the state and dynamics of their income, traditions and flavors;
- analyze the experience of competitors, taking into account changes in the tax, the price and customs policy;

- monitor the sales, do a comparison of planned data with the results obtained in terms of volume, sales, marketing time, identify deviations and changes in the market;
- taking part in drawing up plans for turnover and commodity support;
- carry out regular contacts with suppliers;
- monitor the implementation by counterparties of contractual obligations, including the flow of goods in the agreed range by maturity, quality, quantity,
- participate in the drafting of the claims to counterparty;
- participate in the preparation of responses to customer complaints;
- take measures to accelerate the turnover of goods, reduction of trade losses, exploring the reasons for the formation of excessive commodity resources and «illiquids», develop measures for their implementation;
- control the cash balances in the warehouse of the enterprise;
- participate in the stocktaking of goods;
- carry out records of the results of the sale of goods, reviews of market conditions, reporting on the established forms, preparation of documents related to the supply and sale of goods;
- carry goods orders via telephone and company software;
- participate in the formation of prices.

Thus, it is the manager who does the basic operations of the organization of commodity supply, formation of range and implementation of relationships with suppliers in its segment.

Due to the fact that «FRUIT IMPORT UKRAINE» LLC has been operating for many years on the territory of Ukraine, in its procurement work now there is almost completely absent such stages as the formation of product lines, the adoption of targeted solutions for the purchase and delivery of goods, searching and selection of suppliers.

Thus, the purchasing work in «FRUIT IMPORT UKRAINE» LLC now has a reduced number of stages:

- identification of customer demand;
- process control;
- determination of the economic efficiency of the procurement operation.

However, describing the first phase of the procurement in the enterprise, it should be noted that the complex work on the study of consumer demand in the enterprise is currently not available. Information on the state of consumer demand for certain products, changes in demand is going only on the basis of personal observations of sellers and data about the availability of goods.

Long-term work on the study of consumer demand of «FRUIT IMPORT UKRAINE» LLC shows that the main contingent of buyers is the population served by the nearby houses and private entrepreneurs.

Furthermore, the presence of competitors in close proximity leads to the need for a complex assortment of goods in the enterprise so each buyer had an opportunity to purchase all goods he needs.

All this makes the management of the enterprise more thoughtful approach to the organization of commodity supply and establishing economic relations.

Due to the fact that in Ukraine there are usually several suppliers of the same goods, during the organization of economic relations the company's management is primarily stand behind the choice of provider, ensuring optimal delivery conditions. Supplier selection is carried out by comparing the different conditions of the supply of goods of individual suppliers and the selection on the basis of a comparison of the suppliers who best meet the requirements of the organization.

In order to better understand the work of the enterprise associated with the commodity supply, it should be firstly looked through the suppliers of the enterprise. Variety of supplied goods for some suppliers are listed below in Appendix B.

Presented in Appendix B information shows that during the studied period it's expanding the range of products offered by suppliers. This allows greatly expand the intra-group and group product range, allows to meet customer demand

fully. Changing the range of products and increasing of consumer demand also leads to an increase in the supply of all goods.

Due to the features and seasonality of consumer demand for certain groups of goods, the enterprise must order different quantity in different periods of the year, with which he copes well. Looking the Table 2.3 is possible to analyze the flow of goods by commodity groups.

Table 2.3

Dynamics of the goods flow of «FRUIT IMPORT UKRAINE» LLC by commodity groups in 2016-2018, % SKU

Commodity group	2016	2017	2018	Absolute deviation		Growth rate, %	
				2017 to 2016	2018 to 2017	2017 to 2016	2018 to 2017
Sausage and sausage products, semi-finished meat	6,00	5,00	7,00	(1,00)	2,00	83,33	140,00
Fresh meat	9,00	8,00	10,00	(1,00)	2,00	88,89	125,00
Fresh fish, dried, salted, smoked, canned fish	5,00	5,00	7,00	0,00	2,00	100,00	140,00
Milk and dairy products	10,00	16,00	9,00	6,00	(7,00)	160,00	56,25
Grocery	15,00	20,00	15,00	5,00	(5,00)	133,33	75,00
Bread and bakery products	12,00	12,00	14,00	0,00	2,00	100,00	116,67
Soft drinks, alcohol drinks	3,00	2,00	3,00	(1,00)	1,00	66,67	150,00
Vegetables, fruits	10,00	12,00	14,00	2,00	2,00	120,00	116,67
Non-food products	30,00	20,00	21,00	(10,00)	1,00	66,67	105,00

Internal documentation of «FRUIT IMPORT UKRAINE» LLC

Notation: SKU, in full stock keeping unit is a code number, typically used as a machine-readable bar code, assigned to a single item of inventory. As part of a system for inventory control, the SKU represents the smallest unit of a product that can be sold from inventory, purchased, or added to inventory. Applied to wholesale, retail, or production operations, the SKU can assist in monitoring transactions, tracking customer spending patterns, controlling inventory and purchasing, and providing information about pricing. More simply, SKU – is an article of a product.

The Table 2.3 shows that the sausages and fresh meat in 2016 amounted to 6% and 9%, respectively, in 2017 to 5% and 8% of the total flow of goods in the enterprise, at the time, as in 2018, these groups were 7% and 10% respectively. This is due to the fact that at the end of 2016 customers bought products for the New Year, and in the second quarter of 2018 was no less important holiday - Easter. Also in the same period, many people gather for barbecues, in connection with this they purchase large quantities of meat and sausage products.

Rising flow of fish products increased by the end of the study period, as many Ukrainians post. Dairy products are in high demand in the first quarter of 2017, because many people in our country treat colds, particularly active during this period, by folk remedies.

As for groceries, it should be noted that the percentage of its flow is quite high throughout the whole period, as, for example, cereal is nutritious food and has low price.

For bakery products demand grew in the second quarter 2018 due to the Easter holiday, as most residents in this period buy cakes for the holiday.

Non-alcoholic and alcoholic beverages have an increase in the 4th quarter 2016 and the 2nd quarter of 2018 also due to the holidays and the opening of the barbecue season.

A particularly high percentage of the flow of fruits and vegetables segment is observed in the spring, because young vegetables enter the market.

Non-food sales have the largest part of sales by the end of the year because many people buy gifts for friends and relatives on New Year's party.

Commodity supply organization involves not only the correct procurement of goods, but the signing of contracts with suppliers, in consequence, - monitoring compliance of signed contracts of delivery. Analysis of the implementation of agreements on the supply of goods by suppliers is presented in Table 2.4.

The Table 2.4 shows that some vendors almost always operate contracts for 100%. These are providers («Kyivhlib» PJSC, Agrobusiness, Nestle, Dobrodiya TH, «Chumak» JSC, Coca-cola Beverages Ukraine and Tropik), with which the

enterprise has very well established relations, with which it is working for a long time and orders the same volumes of production. Execution of orders by 100% indicates that, first of all, enterprises can collect the necessary items for the enterprise easy (by constantly need of volume, and the assortment of products), and secondly, it means that vendors come always on time that always let the enterprise to take their cars.

Table 2.4

**Implementation of good delivery contracts of
«FRUIT IMPORT UKRAINE» LLC by suppliers in 2016-2018, %**

Supplier	% of implementation		
	2016	2017	2018
«Kyivhlib» PJSC	100,00	100,00	100,00
Agrobusiness	100,00	99,90	100,00
Danone	75,00	80,00	78,00
«Yahotynskiy maslozavod» PJSC	95,00	97,00	97,00
«Laktalis Ukraine» SC	65,00	68,00	70,00
Nestle	100,00	99,00	98,00
Roshen	98,00	90,00	97,00
Rohanskyi myasokombinat	92,00	92,00	93,00
Globynskiy myasokombinat	95,00	96,00	95,00
Myronivskiy hliboprodukt	98,00	97,00	98,00
Shelf Ltd.	75,00	76,00	76,00
MGM	92,00	92,00	92,00
Dobrodiya TH	100,00	100,00	100,00
«Chumak» JSC	100,00	100,00	100,00
Coca-cola Beverages Ukraine	100,00	100,00	100,00
«Kalynivka» TH	90,00	91,00	91,00
Frutko	91,00	91,00	90,00
Tropik	100,00	100,00	100,00

Internal documentation of «FRUIT IMPORT UKRAINE» LLC

The Table 2.4 shows that some vendors almost always operate contracts for 100%. These are providers («Kyivhlib» PJSC, Agrobusiness, Nestle, Dobrodiya TH, «Chumak» JSC, Coca-cola Beverages Ukraine and Tropik), with which the enterprise has very well established relations, with which it is working for a long time and orders the same volumes of production. Execution of orders by 100% indicates that, first of all, enterprises can collect the necessary items for the

enterprise easy (by constantly need of volume, and the assortment of products), and secondly, it means that vendors come always on time that always let the enterprise to take their cars.

All three companies, that carry milk products, fulfill orders not in full volume. The manager orders the required quantity, but sometimes supplier hasn't part of goods in the stock, and sometimes the supplier does not bring some items due to the fact that there was a low sales of this product.

Supplier Roshen in the second period has a significant decrease in the percentage of deliveries as Roshen ceased to deliver to «FRUIT IMPORT UKRAINE» LLC cakes.

Rohanskyi myasokombinat, Shelf Ltd., MGM, as well as suppliers of vegetables («Kalynivka» TH and Frutko) have relatively low % of deliveries due to the fact that they often have failures on product quality. «FRUIT IMPORT UKRAINE» LLC always monitors the quality of its products, so if there is any slightest suspicion of inconsistency of quality to claimed quality, the enterprise declares off production.

«Globynskyi myasokombinat» has 95-96% of the supply only due to the fact that the supplier does not comply with the time corridors, coming at a time when shipping of fresh meat for all suppliers has been completed.

«Myronivskyi hliboprodukt» performs deliveries to 97-98% due to the fact that often there isn't some part of ordered goods.

Based on the table it must be concluded that is necessary for the enterprise to establish the information flows between their departments and suppliers to improve the quality of supply of goods.

Analysis of the implementation of the plan and dynamics of retail turnover of «FRUIT IMPORT UKRAINE» LLC is produced quarterly. This will set how rhythmically retail sale develops and how uniformly is satisfied consumer demand for goods. The rhythm of turnover development of the enterprise trade is presented in Table 2.5.

«FRUIT IMPORT UKRAINE» LLC successfully fulfilled the plan of retail turnover in all quarters. Moreover, in all three periods, the plan was exceeded. Due to the fact that the enterprise is well known, as a part of the network, it is situated in a convenient place, as well as by the appropriate parties, it exceeded the plan of turnover in the first quarter of its work at 11.21%. In 2017 and 2018 turnover plan was exceeded by 4.4% and 2.16% respectively. Undoubtedly, such development is very encouraging for the new enterprise.

Table 2.5

Rhythm of turnover development of «FRUIT IMPORT UKRAINE» LLC in 2016-2018, ths. UAH

	2016	2017	2018
Plan	140 000,00	180 000,00	220 000,00
Fact	155 694,84	187 923,67	224 756,71
Absolute deviation	15 694,84	7 923,67	4 756,71
% of plan	111,21	104,40	102,16

Internal documentation of «FRUIT IMPORT UKRAINE» LLC

Implementation of the plan and dynamics of retail turnover depends on three main groups of factors:

- availability of commodity resources, their correct distribution and use;
- availability of labor resources and the efficiency of workers;
- the state, development and usage efficiency of material and technical base.

The main factors of the successful development of turnover are availability and rational usage of commodity resources.

«FRUIT IMPORT UKRAINE» LLC provides the following data on the movement of goods listed in the Table 2.6.

In 2016 the enterprise had inventories in the amount of 19 981 ths. UAH for the year the enterprise received the goods in the amount of 162 743 ths. UAH, and sold the goods in the amount of 155 695 ths. UAH, other disposal of the goods was 3 052 ths. UAH. In this case, under other disposal of goods it means the write-off (damage of goods or packaging, expiration date, theft etc.). As a result, at the beginning of the next year, inventories totaled 23,977 ths. UAH. In general,

inventories in 2017 and 2018 increased by 20% and 25% respectively compared to the previous beginning of periods. Receiving of goods is growing every period by approximately 21%, due to the fact that the enterprise is gaining popularity among customers. But, in addition, other disposal of goods also increases. This is due to the fact that: commodity packaging tends to spoil (in the fall, for example); when improperly ordered quantity of goods, some goods are written off because of the delay; theft is also progressing. In general, the dynamics of inventory is positive.

Table 2.6

**Commodity balance of «FRUIT IMPORT UKRAINE» LLC in 2016-2018,
ths. UAH**

Article	2016	2017	2018	Absolute deviation		Growth rate, %	
				2017 to 2016	2018 to 2017	2017 to 2016	2018 to 2017
Inventory at the beginning of the period	19 981,00	23 977,20	29 971,50	3 996,20	5 994,30	120,00	125,00
The goods revenue	162 742,66	197 470,10	239 214,92	34 727,44	41 744,82	121,34	121,14
Other disposal of goods	3 051,62	3 552,13	4 068,09	500,51	515,96	116,40	114,53
Inventory at the end of the period	23 977,20	29 971,50	40 361,62	5 994,30	10 390,12	125,00	134,67

Internal documentation of «FRUIT IMPORT UKRAINE» LLC

It can be also analyzed the dynamics of the inventory of «FRUIT IMPORT UKRAINE» LLC by months of study period. The results are shown in the Table 2.7.

Actual retail turnover for the 4th quarter 2016 amounted to 155 694.84 ths. UAH. Inventories in the 4th quarter of the enterprise were (in days):

On 01.10 19 981 : (155 694,84:90) = 11,55 days

On 01.11 21 068,21 : (155 694,84:90) = 12,18 days

On 01.12 22 436,98 : (155 694,84:90) = 12,97 days

On 01.01 23 977,2 : (155 694,84:90) = 13,86 days

Table 2.7

**Dynamics of inventory of «FRUIT IMPORT UKRAINE» LLC in 2016-2018,
ths. UAH**

Years		2016	2017	2018
At the beginning of the quarter		19 981,00	23 977,20	29 971,50
On the first day of the second month of the quarter		21 068,21	25 694,34	33 694,82
On the first day of the third month of the quarter		22 436,98	27 698,37	37 964,59
At the end of the quarter		23 977,20	29 971,50	40 361,62
Absolute deviation	On the first day of the second month of the quarter	1 087,21	1 717,14	3 723,32
	On the first day of the third month of the quarter	1 368,77	2 004,03	4 269,77
	At the end of the quarter	1 540,22	2 273,13	2 397,03
Growth rate, %	On the first day of the second month of the quarter	105,44	107,16	112,42
	On the first day of the third month of the quarter	106,50	107,80	112,67
	At the end of the quarter	106,86	108,21	106,31

Internal documentation of «FRUIT IMPORT UKRAINE» LLC

Actual retail turnover for the 1st quarter of 2017 is equal to 187 923.67 ths. UAH. Inventories in the 1st quarter were as follows (in days):

On 01.01 23 977,2 : (187 923,67:90) = 11,48 days

On 01.02 25 694,34 : (187 923,67:90) = 12,31 days

On 01.03 27 698,37 : (187 923,67:90) = 13,27 days

On 01.04 29 971,5 : (187 923,67:90) = 14,35 days

Actual retail turnover for the 2nd quarter 2018 is equal to 224 756.71 ths. UAH. Inventories in the 2nd quarter amounted to (in days):

On 01.04 29 971,58 : (224 756,71:90) = 12,0 days

On 01.05 33 694,82 : (224 756,71:90) = 13,49 days

On 01.06 37 964,59 : (224 756,71:90) = 15,2 days

On 01.07 40 361,62 : (224 756,71:90) = 16,16 days

It can be seen that inventory in days increases each month, but it should be noted the fact that the company is new and is just developing. And whereas it is an enterprise, this trend can be regarded as positive, since it means that «FRUIT IMPORT UKRAINE» LLC completes its product range and attract new customers. The result of that fact that new customers are attracted is the growth of turnover.

PART 3

IMPROVEMENT OF INVENTORY MANAGEMENT AT «FRUIT IMPORT UKRAINE» LLC

3.1. Optimization of resources inventory at the enterprise

Inventory formation policy has significant influence on the formation of trade turnover volume of the company. How much to order, when and how long to keep – these are key issues, the subject of continuous monitoring that requires focusing on aspects of quality and consumer satisfaction and producer satisfaction.

Commodity supply management is complicated because of rapid change of operation environment of trade enterprises in which is operated the planning of sales and establishment of inventories. As a result of changing economic conditions inventories may be understated or overstated. Both are economically disadvantageous, so the inventory management is extremely important. The process of inventory management in commercial enterprises require a deep understanding of the impact of various factors on their formation.

Opportunities of «FRUIT IMPORT UKRAINE» LLC to ensure the product range stability, increasing consumer demand satisfaction, organization of the continuity of the implementation process, implementing certain pricing policy, identifying specific issues of financial activities depend on inventory formation policy, their size and structure.

The main areas should be: strategic planning of development and reform of the commodity supply system; optimizing of choice of suppliers and types of goods distribution system; improving process technologies of commodity promotion and choice of technical means for their support; development of a flexible inventory management system and transmission of orders for delivery of goods.

Optimization of inventory management is one of the most important aspects of commodity supply management at «FRUIT IMPORT UKRAINE» LLC. In

modern trade management system, such systems of inventory management at which the level of inventories is reduced to a minimum, and commodity promotion is done by a principle «Just-In-Time» are optimal. According to this principle, the construction of logistics systems in production, supply and distribution is based on synchronizing the delivery of material resources, unfinished products, finished products (including products) in the required amounts to the time when the links of the logistic system need them in order to minimize costs, related to stocks.

There is no doubt that the area of origin of the concept «Just-In-Time» was the sphere of consumption of finished products and goods, and this determines the decisive role of trade as the final, closest to the final consumer, links of logistics systems in defining the parameters of material (product) flows. This ensures the applicability of the so-called «method of quick response» – method of planning and regulation of deliveries to retailers, which provides close cooperation between commercial enterprise and its suppliers, optimizing inventory of the enterprise and their reducing (not below the level that ensures to meet the immediate applications of customers).

When using this method, «FRUIT IMPORT UKRAINE» LLC will get the opportunity to decide issues on the purchase of goods from the supplier close to the point where it is expected actual purchase by a customer.

Application of method of quick response gives an opportunity to increase the frequency of deliveries of goods with simultaneous reduction of medium size of consignments in individual items, resulting in a decrease of the total inventory in the enterprise, the retail distribution network and logistics system as a whole.

The criteria for the efficiency of inventory management are the organization of uninterrupted trade of all kinds of goods at the lowest costs of storage, transportation and sales due to the high service culture.

The main condition of the method of quick response is accurate and timely accounting of goods in quantitative terms, the organization of automated commodity supply management system based on subsystem «Study and forecasting of goods» and the implementation of organizational and technical

measures to ensure the ability of the supplier as soon as possible to reset production at issue of ordered products.

However, the preconditions for the implementation of this complex work on «FRUIT IMPORT UKRAINE» LLC is the introduction and widespread use in the final link of the commodity promotion system – retail trade network – of modern multifunctional kinds of computer technology, firstly – directed to the timely receipt of true accurate information about the availability of goods in stock.

Thus, to solve inventory management problems of commercial enterprise it should be solved such tasks as:

- 1) optimization of inventory levels in each company;
- 2) determining rational ratios of the stocks in the retail and wholesale trade;
- 3) evaluation of locations of warehouses for storing goods;
- 4) choice of methods of funding and maintaining inventory levels;
- 5) finding a compromise between the level of consumer service in trade and inventory levels in the system, by the means of transportation and the size of reserves etc. that are appropriate to solve using econometric methods.

It is necessary to implement the ERP-system (Enterprise Resource Planning) on «FRUIT IMPORT UKRAINE» LLC.

«FRUIT IMPORT UKRAINE» LLC is a complex set of interacting and interdependent elements. With the development and expansion of the enterprise, increasing the number of services and customers, control of commodity supply system become complicated and slows down. There is a need to create a unified system that will serve and please to all departments and units.

ERP is the concept of an agreed solution of tasks of accounting, control, planning and management of production and financial resources commodity supply and warehouse. ERP system is an integrated information management system that enables to create a single information environment to automate planning, accounting, control, monitoring and analysis of all major business processes of «FRUIT IMPORT UKRAINE» LLC, which implements the concept of ERP.

The main tasks of ERP systems are:

- maintenance of design and technological specifications that determine the composition of services and material resources and operations necessary for their provision;
- formation of sales plans;
- planning of material needs and component needs, terms and volume of deliveries to the plan of manufacturing the services;
- inventory and procurement management, maintenance of contracts, providing accounting and inventory optimization;
- capacity planning;
- operative financial management, including a financial plan and monitoring its implementation;
- financial and management accounting;
- project management, including planning of steps and resources required to implement them.

There are several features that should have a modern ERP system:

- complexity: automated control system should cover all business processes and scope of modern enterprise management to provide complete information for decision-making;
- integration: all data should be stored in a single information base, which prevents duplicate of data and increases the accuracy of the information;
- efficiency: the system must operate in real time, allowing to timely make decisions based on reliable information;
- modularity: implementation of the ERP system functionality should occur sequentially, starting with the highest priority processes that will allow to significantly quickly feel the impact of the project and more accurately predict the terms of the launch of the project;
- formalization: during the introduction of a system integrator should have a clear plan of actions that will minimize the project risks. In addition, all processes

must be documented and systematized, that would greatly simplify the analysis and development of the project;

- branch affiliation: ERP system should take into account the specific needs of specific industry and the national characteristics that will minimize the cost of its localization in the project. In this case, the configuration of ERP system to the needs of a particular customer can be minimized due to the previous settings. This approach guarantees the safety of system logic and its effective development and future updates;

- magnitude: ERP system must have high rates of magnitude to preserve the investments in the further development of the decision.

ERP model includes the following subsystems, which are often referred to as blocks or series: Inventory management; Supply management; Sales management; Production management; Planning; Service management; Supply chain management; Financial management.

Usage of full-featured unified system of resource management can provide big benefits to the enterprise in management efficiency, increasing the speed of response to changes in the environment, improving the quality of customer service. ERP-systems allow to use a single integrated program instead of several disparate.

Unified system comprehensively manages all areas of the company. After the introduction of ERP system in the company it would significantly reduced the volume of paper documents, increased the transparency of all processes, information would be more accessible and convenient to operate. Besides the process automation of institution, implementation of ERP system increases the mutual responsibility of all its units, contributes to employees' discipline. For management the ERP system provides tools to work with interrelated indicators and strategic management of the organization as a whole.

ERP systems are compatible with the system of customer relationship management and quality control system aimed at maximum satisfaction of the institution in management facilities, so the system will significantly improve the management of commodity supply system at «FRUIT IMPORT UKRAINE» LLC.

An important parameter of any investment project is the value and the direction of the investment. Implementation project of the automated resource management system at «FRUIT IMPORT UKRAINE» LLC will include the following investments (Table 3.1). Thus, the total costs of this project are 696,5 ths. UAH.

Table 3.1

The budget of the implementing project of ERP systems at «FRUIT IMPORT UKRAINE» LLC, ths. UAH

Content	The amount of expenses
Negotiation of implementation of ERP-system in the enterprise	0,0
Signing contract and prepayment for the project	45,0
Development of business plan of the project and of the project management system of implementation of ERP systems in the enterprise	15,0
Hiring personnel, training	9,5
Emission of building (rooms)	4,5
Purchase of personal computers (4 pcs.), office equipment	48,0
Purchase 3 server workstations	180,0
Installation and setup of server workstations	5,0
Purchase of computer hardware for automated workstations	50,0
Purchase of ERP system software	150,0
Purchase of inventory and supply management software	40,0
Purchase of financial and budgeting management software	30,0
Purchase of production and marketing automated management software	45,0
Adaptation, programming and testing of ERP systems software complex	20,0
Reengineering of business processes in accordance with the new system	13,0
Activating Software	7,5
Defining the scope and content of training material for training purposes in accordance with the breadth of the enterprise process system	8,0
Conducting training sessions	26,0
Total	696,5

Compiled by the author

To finance the project, it is supposed to use 696,5 ths. UAH of own funds. Implementation of the ERP system at «FRUIT IMPORT UKRAINE» LLC will help to further increase the sales of services and, consequently, the revenues by reducing operating and management costs and increase the working efficiency (Table 3.2). Data on planned additional profit is taken by analogy with other similar enterprises.

Table 3.2

Forecasting of revenues and expenses of the implementing ERP systems project at «FRUIT IMPORT UKRAINE» LLC, ths. UAH

Article	Value of article		
	Optimistic scenario	Realistic scenario	Pessimistic scenario
Sales revenue	4000,0	3500	3000,0
Net sales revenue	3333,3	2916,7	2500,0
Cost of goods (services)	1400,0	1295	1200,0
Gross profit	1933,3	1621,7	1300,0
Operating expenses	548,0	506,9	469,8
including amortization	48,5	48,5	48,5
Profit from operating activities	1385,3	1114,8	830,2
Pre-tax profit	1385,3	1114,8	830,2
Expenses for income tax	221,6	178,4	132,8
Net income	1163,7	936,4	697,4

Compiled by the author

Data of the Table 3.2 indicate that implementing of ERP systems at «FRUIT IMPORT UKRAINE» LLC in the optimistic scenario will allow to obtain additional revenue 4 000,0 ths. UAH, and additional net income 1 163,7 ths. UAH, in realistic – 3 500 ths. UAH and 936,4 ths. UAH in accordance. In pessimistic scenario, the additional revenue will be 3 000,0 ths. UAH, and additional net income will amount to 697,4 ths. UAH. The next step is studying the profit for 5 years, with different production capacity.

Table 3.3

Forecasting of revenues and expenses of the implementing ERP systems project at «FRUIT IMPORT UKRAINE» LLC (the pessimistic scenario), ths. UAH

Article	Pessimistic scenario				
	2018	2019	2020	2021	2022
Sales revenue	1 800	2 400	3 000	3 150	3 300
Net sales revenue	1 500	2 000	2 500	2 625	2 750
Cost of goods (services)	720	960	1 200	1 260	1 320
Gross profit	780	1 040	1 300	1 365	1 430
Operating expenses	281,9	375,8	469,8	493,2	516,7
including amortization	48,5	48,5	48,5	50,9	53,4
Profit from operating activities	498,1	664,2	830,2	871,8	913,3
Pre-tax profit	498,1	664,2	830,2	871,8	913,3
Expenses for income tax	104,6	126,2	132,8	139,5	146,1
Net income	393,5	538,0	697,4	732,3	767,2

Compiled by the author

With the pessimistic scenario in the first year of the project with production capacity by 60%, the amount of revenue will be 1 800,0 ths. UAH, and net income – 393,5 ths. UAH (Table 3.3). With production capacity by 80% in the second year, the amount of revenue will be 2 400,0 ths. UAH, and net income – 538 ths. UAH, with production capacity by 100% in the third, fourth and fifth years, the amount of revenue will be 3 000,0 ths. UAH, 3 150 ths. UAH and 3 300 ths. UAH respectively, and net income – 697,4 ths. UAH, 732,3 ths. UAH and 767,2 ths. UAH respectively.

Table 3.4

Forecasting of revenues and expenses of the implementing ERP systems project at «FRUIT IMPORT UKRAINE» LLC (the realistic scenario), ths. UAH

Article	Realistic scenario				
	2018	2019	2020	2021	2022
Sales revenue	2 100	2 800	3 500	3 675	3 885
Net sales revenue	1 750,0	2 333,3	2 916,7	3 062,5	3 237,5
Cost of goods (services)	777,0	1 036,0	1 295,0	1 359,8	1 437,5
Gross profit	973,0	1 297,3	1 621,7	1 702,8	1 800,1
Operating expenses	304,1	405,5	506,9	532,2	562,7
including amortization	48,5	48,5	48,5	50,9	53,8
Profit from operating activities	668,9	891,8	1 114,8	1 170,5	1 237,4
Pre-tax profit	668,9	891,8	1 114,8	1 170,5	1 237,4
Expenses for income tax	140,5	169,4	178,4	187,3	198,0
Net income	528,4	722,4	936,4	983,2	1 039,4

Compiled by the author

With the realistic scenario in the first year of the project with production capacity by 60%, the amount of revenue will be 2 100,0 ths. UAH, and net income – 528,4 ths. UAH (Table 3.4). With production capacity by 80% in the second year, the amount of revenue will be 2 800,0 ths. UAH, and net income – 722,4 ths. UAH, with production capacity by 100% in the third, fourth and fifth years, the amount of revenue will be 3 500,0 ths. UAH, 3 675,0 ths. UAH and 3 885,0 ths. UAH respectively, and net income – 936,4 ths. UAH, 983,2 ths. UAH and 1 039,4 ths. UAH respectively.

Table 3.5

Forecasting of revenues and expenses of the implementing ERP systems project at «FRUIT IMPORT UKRAINE» LLC (the optimistic scenario), ths. UAH

Article	Optimistic scenario				
	2018	2019	2020	2021	2022
Sales revenue	2 400	3200	4000	4200	4440
Net sales revenue	2 000	2 666,7	3 333,3	3 500	3 700
Cost of goods (services)	840	1 120	1 400	1 470	1 554
Gross profit	1 160	1 546,7	1 933,3	2 030	2 146
Operating expenses	328,8	438,4	548	575,4	608,3
including amortization	48,5	48,5	48,5	50,9	53,8
Profit from operating activities	831,2	1 108,3	1 385,3	1 454,6	1 537,7
Pre-tax profit	831,2	1 108,3	1 385,3	1 454,6	1 537,7
Expenses for income tax	174,6	210,6	221,6	232,7	246,0
Net income	656,6	897,7	1 163,7	1 221,9	1 291,7

Compiled by the author

Thus, in the first year of the project with production capacity by 60%, the amount of revenue will be 2 400,0 ths. UAH, and net income – 656,6 ths. UAH (Table 3.5). With production capacity by 80% in the second year, the amount of revenue will be 3 200,0 ths. UAH, and net income – 897,7 ths. UAH, with production capacity by 100% in the third, fourth and fifth years, the amount of revenue will be 4 000,0 ths. UAH, 4 200,0 ths. UAH and 4 440,0 ths. UAH respectively, and net income – 1 163,7 ths. UAH, 1 221,9 ths. UAH and 1 291,7 ths. UAH respectively.

3.2. Predictive results evaluation of implemented measures

Efficiency of optimization project of commodity supply at «FRUIT IMPORT UKRAINE» LLC is determined based on estimation of cash flows related to its implementation, through the following indicators: net present value; profitability index; return index; payback period; IRR (Internal rate of return).

The schemes of project cash flows are based on the following information:

- total investment is 545,0 ths. UAH;
- all cash flows are calculated at the end of the year;

- initial investment is made at the beginning of the period;
- analysis is performed for the first five years from the beginning of the project;
- depreciation as an internal source of financing is considered as cash flow;
- it does not take into account inflation, all calculations are made at constant prices at the start of the project, therefore all interest rates that are used (discount rate, return index, IRR), are real;
- cash flow from financing the project (receipt of loan and its repayment, interest payments) is not included in the cash flows, their cost is taken into account in the discounting of future cash flows;
- in the case of loans net cash flows increase by the amount of income tax reduction from the inclusion of loan interest in costs;
- net cash flows are calculated as the difference between total cash inflows and total cash outflows;
- NPV is determined on the basis of net cash flows using a discount factor of present value (discount rate).

As at the calculation of net income and profitability, discounted cash flow analysis gives different results in the implementation of alternative projects.

The most famous and most used criteria for evaluating projects is Net Present Value. It is the discounted value of the project (the present value of benefits or income from investments). NPV is the difference between the future value of the expected benefits flow and the present value of current and future expenses throughout the project cycle [47]:

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+k)^t} - \sum_{t=0}^n \frac{I_t}{(1+k)^t}, \quad (3.1)$$

where NPV – net present value; CF_t – expected net cash flows; k – rate of return required by the project; I_t – the initial capital expenditure, which is carried out (or the present value of all costs).

If the NPV is positive, the project can be recommended for funding. If NPV is zero, the revenues from the project will be enough to restore invested capital. If the NPV is less than zero - the project is considered unprofitable. When selecting mutually exclusive projects in the absence of budget constraints it is selected the project with a maximum net present value (NPV).

In order to calculate basic indicators of economic efficiency of the project it should be discounted net cash flows of the project (as the discount rate of bank interest rate it was taken 25%) (Tables 3.6 – 3.8).

Table 3.6

Scheme of cash flows from the implementing ERP systems project at «FRUIT IMPORT UKRAINE» LLC (the pessimistic scenario), ths. UAH

Article	Pessimistic scenario					Total
	2018	2019	2020	2021	2022	
1. Net cash flow	442,0	586,5	745,9	783,2	820,6	3 378,2
1.1. Net income	393,5	538,0	697,4	732,3	767,2	3 128,4
1.2. Amortization	48,5	48,5	48,5	50,9	53,4	249,8
2. Investments	696,5					696,5
3. Discounting index	1	0,800	0,640	0,512	0,410	x
4. Discounted cash flow	442,0	469,2	477,4	401,0	336,1	2 125,7
5. Discounted investment costs	696,5					696,5
6. Discounted net cash flow	-254,5	469,2	477,4	401,0	336,1	1 429,2

Compiled by the author

In the pessimistic scenario for the entire period of the project the gross discounted cash flow will amount to 2 125,7 ths. UAH, the total amount of investments – 696,5 ths. UAH, and discounted net cash flow – 1 429,2 ths. UAH.

Table 3.7

Scheme of cash flows from the implementing ERP systems project at «FRUIT IMPORT UKRAINE» LLC (the realistic scenario), ths. UAH

Article	Realistic scenario					Total
	2018	2019	2020	2021	2022	
1. Net cash flow	576,9	770,9	984,9	1 034,1	1 093,2	4 460,0
1.1. Net income	528,4	722,4	936,4	983,2	1 039,4	4 209,8
1.2. Amortization	48,5	48,5	48,5	50,9	53,8	250,2
2. Investments	696,5					696,5
3. Discounting index	1	0,800	0,640	0,512	0,410	X
4. Discounted cash flow	576,9	616,7	630,3	529,5	447,8	2 801,2
5. Discounted investment costs	696,5					696,5
6. Discounted net cash flow	-119,6	616,7	630,3	529,5	447,8	2 104,7

Compiled by the author

Thus, in the realistic scenario for the entire period of the project the gross discounted cash flow will amount to 2 801,2 ths. UAH, the total amount of investments – 696,5 ths. UAH, and discounted net cash flow – 2 104,7 ths. UAH.

Thus, in the optimistic scenario for the entire period of the project the gross discounted cash flow will amount to 3 440,7 ths. UAH, the total amount of investments – 696,5 ths. UAH, and discounted net cash flow – 2 744,2 ths. UAH.

Further calculations are conducted only in the optimistic scenario.

Table 3.8

Scheme of cash flows from the implementing ERP systems project at «FRUIT IMPORT UKRAINE» LLC (the optimistic scenario), ths. UAH

Article	Optimistic scenario					Total
	2018	2019	2020	2021	2022	
1. Net cash flow	705,1	946,2	1 212,2	1 272,8	1 345,5	5 481,8
1.1. Net income	656,6	897,7	1 163,7	1 221,9	1 291,7	5 231,6
1.2. Amortization	48,5	48,5	48,5	50,9	53,8	250,2
2. Investments	696,5					696,5
3. Discounting index	1	0,800	0,640	0,512	0,410	x
4. Discounted cash flow	705,1	757,0	775,8	651,7	551,1	3 440,7
5. Discounted investment costs	696,5					696,5
6. Discounted net cash flow	8,6	757,0	775,8	651,7	551,1	2 744,2

Compiled by the author

Profitability index is the ratio of the total effects (the difference between benefits and costs) to the size of the investment [38]:

$$PI = \sum_{t=0}^n \frac{CF_t}{(1+k)^t} + \sum_{t=0}^n \frac{I_t}{(1+k)^t}, \quad (3.2)$$

where PI – the profitability index on the investment project.

This indicator is closely related to NPV. If the index is less (equal to) one, investment project should be rejected due to the fact that it will not bring additional income on invested funds.

Profitability index for the project is:

$$PI = 3\,440,7 / 696,5 = 4,94.$$

Excess present value index is defined as the ratio of the net investment income of the normal operation year of the business to the size of the initial investments [52]:

$$EPV = \frac{\sum_{t=0}^n NI_t}{t+1} + \sum_{t=0}^n \frac{I_t}{(1+k)^t}, \quad (3.3)$$

where EPV – the excess present value index of on the investment project; NI – net profit.

In the process of evaluating the effectiveness of the project this index plays a supporting role, because can not fully appreciate all the feedback flow of investment project.

The value of this index is:

$$EPV = 841,96 / 696,5 = 1,2.$$

Payback period indicates reimbursement term of capital expenditure of the project of its total net revenue. It can't serve as a measure of profitability because it does not take into account cash flows after the payback [33]:

$$Pp = m + \frac{\sum_{t=0}^n \frac{I_t}{(1+k)^t} - S_m}{CF_{m+1}}, \quad (3.4)$$

where $m \left(\sum_{t=0}^n \frac{I_t}{(1+k)^t} \right) < S_{m+1}$

where S_m – accrued sum of discounted cash flows for the m years; CF_{m+1} – discounted cash flow of $(m+1)$ -th year.

The value of this index is:

$$Pp = 1 + (696,5 - (705,1)) / 757,0 = 1 - 0,01 = 0,99 \text{ years.}$$

Consequently, the obtained figures demonstrate the high efficiency of the project and its feasibility for implementation at «FRUIT IMPORT UKRAINE» LLC.

CONCLUSIONS AND PROPOSITIONS

On the development of commodity supply of retail trade enterprise (the need for it, its structural and territorial organization) is affected many different factors: socio-economic, demographic, geographic, urban planning, transport, organizational, technological, administrative, financial. As a result there can be made the next conclusions and propositions:

1. Rational organization of supplying in retail enterprise should be based on the principles of planning, continuity, rhythm, speed, adaptability, centralization and efficiency taking into account the above requirements. There are two methods of commodity supply: decentralized and centralized. Considering the manner of delivery of goods in retail trade network commodity supply has two forms – transit and warehouse.

2. In the paper it was examined the theoretical and practical aspects of commodity supply management of trade enterprise, the essence of commodity supply, its forms and principles, methods of its management. Practical aspects are considered by the example of «FRUIT IMPORT UKRAINE» LLC, for that it was used internal documentation of the company, including orders for the company's accounting policies. It was analyzed the commodity supply organization of the enterprise, determined advantages and disadvantages of its system. Also it was analyzed the composition, structure and dynamics of its current assets in relation to its administrative structure. Doing economic analysis and evaluation of «FRUIT IMPORT UKRAINE» LLC it was determined that the trade company is profitable and has income. It should be also considered that «FRUIT IMPORT UKRAINE» LLC successfully fulfilled the plan of retail turnover in all years.

3. Based on all above mentioned, it can be summarized that the company is developed and is developing, it is cost-effective, self-liquidating and brings steady income. For the analysis it was used the balance sheet, financial results and other internal documentation of «FRUIT IMPORT UKRAINE» LLC.

An important direction in improving commodity supply of «FRUIT IMPORT UKRAINE» LLC is advanced technology of product distribution using packaging equipment. In this case, packaging equipment serves as commodity supply function during transport, storage of goods and the trading equipment in its implementation on the sales area. This technology involves the comprehensive mechanization of loading and unloading, transport and warehouse operations in all phases of product distribution and sale of goods by the method of self-service.

It was proposed to implement the conception «Just in time», when using this method, «FRUIT IMPORT UKRAINE» LLC will get the opportunity to decide issues on the purchase of goods from the supplier close to the point where it is expected actual purchase by a customer.

4. In order to improve commodity supply management at «FRUIT IMPORT UKRAINE» LLC it is necessary to:

- conduct a targeted assortment policy, which will help the company determine the competitiveness of products in this market segment, will allow to avoid significant financial, business, organizational and commercial risks. The specialists of retail enterprises need to form assortment policy so that to get from each type of product the maximum effect both in monetary terms and in terms of the needs of its customers;
- maintain regular contact with potential customers. Realizing this trend management of the company should develop and implement a system of continuous monitoring of the environment and preservation of data;
- expand the search for possible sources of procurement of goods, creating additional sources for replenishment of commodity resources. To do this, the company should provide consulting and transport services to individuals or companies; intensify the advertising of the company, aimed at potential customers' information about the quality and properties of products, organize and support new aspects of advertising, timely design and send advertisements, messages in the local press and television;

- establish usage of advanced forms and methods of demand analysis on the enterprise, to conduct various kinds of exhibitions, conferences, product testing, questionnaire of customers in order to familiarize them with the goods – novelties, clarification of thoughts about them from potential customers;
- improve the work of employees of accounting and statistical reports by introducing the use of such computer technology that will reduce the cost for processing information, increase turnover and reduce the workload of workers;
- expand the activities of the company within the Statute, in particular: to do leasing transactions and conduct foreign economic activity. Proper management of commodity supply would solve the issue of improving the financial condition and enhance activities in competitive markets.

5. In addition, in order to improve commodity supply management in the company, it should be paid attention to the creation of commercial enterprise logistics system that is connected with the introduction of systematic and structural innovations which would provide determination (and in the future - upgrade) of range, quantitative and qualitative parameters of trade flow that integrates all other elements of the logistics of the enterprise. This is the realization of complex works on the definition and optimization of the range of products that should sell commercial enterprise and which form the specific logistics of commodity flow of the system.

6. Whereas «FRUIT IMPORT UKRAINE» LLC is a complex set of interacting and interdependent elements, it is proposed to implement ERP-systems that allow to use a single integrated program instead of several disparate. Implementation of the ERP system at «FRUIT IMPORT UKRAINE» LLC will help to further increase the sales of services and, consequently, the revenues by reducing operating and management costs and increase the working efficiency. The analysis of the implementation ERP-systems demonstrates the high efficiency of the project and its feasibility for implementation at «FRUIT IMPORT UKRAINE» LLC.

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APPENDIX B

Variety of supplied goods for some suppliers of «FRUIT IMPORT UKRAINE» LLC in 2016-2018

Supplier	Assortment of goods	Variety of supplied goods			Absolute deviation		Growth rate, %	
		2016	2017	2018	2017 to 2016	2018 to 2017	2017 to 2016	2018 to 2017
«Kyivhlib» PJSC	Bread and bakery products	15	19	21	4	2	126,67	110,53
Agrobusiness	Bread and bakery products	3	5	6	2	1	166,67	120,00
Danone	Milk and dairy products	11	13	15	2	2	118,18	115,38
«Yahotynskiy maslozavod» PJSC	Milk and dairy products	7	8	11	1	3	114,29	137,50
«Laktalis Ukraine» SC	Milk and dairy products	27	31	35	4	4	114,81	112,90
Nestle	Confectionery	39	41	42	2	1	105,13	102,44
Roshen	Confectionery	65	59	62	-6	3	90,77	105,08
Rohanskyi myasokombinat	Sausage and sausage products, semi-finished meat	41	45	46	4	1	109,76	102,22
Globynskiy myasokombinat	Sausage and sausage products, semi-finished meat	42	45	47	3	2	107,14	104,44
Myronivskiy hliboprodukt	Sausage and sausage products, semi-finished meat, meat	51	56	58	5	2	109,80	103,57
Shelf Ltd.	Fresh fish, dried, salted, smoked, canned fish	36	39	39	3	0	108,33	100,00
MGM	Fresh fish, dried, salted, smoked, canned fish	38	39	41	1	2	102,63	105,13
Dobrodiya TH	Grocery	15	18	21	3	3	120,00	116,67
«Chumak» JSC	Grocery	36	38	41	2	3	105,56	107,89
Coca-cola Beverages Ukraine	Soft drinks, alcohol drinks	7	7	9	0	2	100,00	128,57
«Kalynivka» TH	Vegetables, fruits	25	28	30	3	2	112,00	107,14
Frutko	Vegetables, fruits	4	4	4	0	0	100,00	100,00
Tropik	Vegetables, fruits	2	1	1	-1	0	50,00	100,00

Source of information: Internal documentation of «FRUIT IMPORT UKRAINE» LLC