Development Sustainable Algorithm Optimal Resource Allocation in Information Logistics Systems

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ABSTRACT
This paper deals with new networks technology of corporation system. The data of processing technology choice is actual task in the problem of development a modern computer networks. There are presentation of functions and parameters as a result of this research.

Keywords
logistics, allocation recourse, mathematical model, computer network, parameters.

1. INTRODUCTION
Logistics is a science of planning, monitoring, transportation management and storing of finished products and raw materials starting from the buyer and ending with the consumer not to mention the transfer, saving and process of data. The technological logistics system is: Support for these systems, in terms of information and computerized.

The concepts of logistics system are focused on cooperative logistics concepts like Supply Chain Management, Efficient Consumer Response (ECR) or Quick Response (QR). Ni Wang, Jye-Chyi Lu and Paul Kva declared that these concepts are actually discussed in recent logistics publications, were typical descriptions of temporary logistics systems are characterized by notions of push/pull control logic, postponement/decentralization of stock keeping as alternative or complementary strategic opportunities for the design of logistics networks [1,2].

The process of building logistic information system that can be practically used to solve applied economical problems goes through the following phases:

1. To collect the data needed for the use of logistic information systems.
2. To design a mathematical model suitable for the use of logistic information systems.
3. To design a simulation system, introduce applications and achieve the required results.
4. Users interfaces.

2. RECOURSE ALLOCATION MODEL
If the optimality criteria option to choose the total profits of the enterprise F (x), so that the object function can be written as:

$$F(x) = \sum_{j-1}^{n} c_j x_j \to \max \qquad (1)$$

A function limitations, imposed production and technological process, in simplest case is a system of linear and nonlinear algebraic equality. Reflecting the allocation of resources to fund operating time of equipment or availability of financial opportunities

$$\sum_{j=1}^{n} a_{ij} x_j \le b_i \quad (i = \overline{1,m}).$$

(2)

Condition, blend to variables can be job with ratio non-negativity views:

$$x_j \ge 0, \quad (j = \overline{1,n}) \qquad (3)$$

Mathematical model (1) – (3) refers to the type simple models of recourse allocation in class linear programming problems. More generally in model (1) –(3) may be include the next recourse constrains:

Recourse constrains equipments b_i in types of time funds runtime i-th group

Restriction on the variables related to the range of products xj in type of range of each variables $d_1^- \le x_j \le d_j^+$ $(j = \overline{1,n})$;

Limit consumption of materials, labor costs and payroll [3].

3. RECOURSES ALLOCATION ALGORITHM
Linear programming problem (1) – (3) will deliver the vector matrix

$$\max(C^T, X) \quad \text{at } AX = B;\ X \ge 0\ ;$$

Where C and X - vectors of dimensions n;

A- Matrix dimension $\times n$;

B- Vector of dimension .

Classical simplex method operates definite matrix, called simplex table. Each table T has property

$$T = D^{-1}A\ ; \qquad (5)$$

Where $D -$ basic square matrix of order m composed of m linearly independent columns of the matrix .

So, if $A = [A_1, A_2, \dots, A_m]$, believing that A_j represents a column 0f the matrix A , obtain

$$D = [A_{k1},\ A_{k2}, \dots, A_{km}],$$

Where: k_j – columns number .

ColumnsA_j , matrix components$D$;

From a basic and which called basic where in k_j - column of the matrix T consists of zeros, except for one unit in j

positions believing that $B^* = D^{-1}B$, expressions of (4) and (5) obtain the relation $TX = B^*$, from which we can conclude that any solution of the system $TX = B^*$ is a solution of $AX = B$ vice versa.

Basic feasible solution of support program is$X$, for which $= B^*$ $TX = B^*$, $X \geq 0$ and moreover$X_{kj} = b_j$, $j = 1, \ldots, m$, and other basic components X_k are zeros. While any given column$T$. Correspond to some basic plan, and the components X_k corresponding columns$A$, are basic components[4,5].

4. STABLE ALGORITHM SIMPLEX METHOD

The idea of the inverse matrix is that of the each iteration the search of the optimal solution recalculated no all matrix condition of the problem , as in the usual simplex method only a portion A_x^{-1} , significantly less than the dimension. Sign of the optimal method of inverse matrix, as in the usual simplex method, acts condition $\Delta_j \geq 0$, $j = \overline{1,n}.$.

However, the amount Δ_j determined from the relation

$$\Delta_j = \Lambda A_j - C_j \,,\ \Lambda = C_x A_x^{-1} \tag{6}$$

Where A_x^{-1} - matrix inverse to the base at the current iteration;

C_x - vector of the coefficient of the objective function, meet the basic variables to the current iterations;

A_j - j Column vector of the matrix ; C_j- coefficient of the objective function j variables$j = \overline{1,n}$.

Computational procedure for solving the problem involves filling of the auxiliary and main tables. In table enter the following data of the linear programming problems, decision concerning of the initial support program$X$, the basic components of the initial support program $-X_{i0}$, $i = \overline{1,m}$;

Elements $\|a_{ij}\|_{j=\overline{1,n}}$ - the expansion coefficients of the vectors A_j the basic vectors; components of basic vectors in a matrixA_x; components of the vector C - lineC_j; magnitude estimates Δ_j , defined by the formula (6). Where the main parts of main column, enter the following data [6].

In column B_x- number of basic vectors; in column e_0- values of the basic variables e_{i0} $i = \overline{1,m}$, $e_0 = A_x^{-1}A_0$, $e_{i0} = X_{i0}$; in columns $e_1, e_2, \ldots, e_m$ - elements $\|e_{ij}\|_{j=\overline{1,n}}$ matrix A_x^{-1} ; in the last line – components λ_j vector Λ , which are calculated by the formula (6). To additional column of the table if the problem is not solved, written vector A_k , which will be held in basic for which $\Delta_k = min\Delta_j$, components of the vector A_k , the main table is defined by the formula $A_k^{och} = A_x^{-1} A_k^{Aux}$, where A_k^{Aux} - vector A_k, taken from the auxiliary tables. If all $a_{ik} \leq 0$, the problem is not taken because of the objective function unbounded certain additional recourses.

In the presence of positive elements a_{ik} determined by the vector which is derived from the basic $\Theta_r = \min\left\{\frac{e_{i0}}{a_{ik}}/a_{ik} > 0\right\}$. let such a vector is a vector A_r then a_{ir} - guide element. Next is filled the second all subsequent main table using recurrence relations: $\Theta_r = \begin{cases} e_{ij}^1 - \frac{e_{rj}^1}{a_{rk}} * a_{ik}^1, & at \quad i \neq r \\ \frac{e_{rj}^1}{e_{rk}^1}, & at \quad i = r \end{cases}$
$i = \overline{1,m}$, $j = \overline{1,n}$.

Stability of the algorithm provides a check matrix function limitations resulting from or degeneracy followed correction ill condition or singular matrix restrictions.

5. THE RESULTS

This paper deals with new networks technology of corporation system. The data of processing technology choice is actual task in the problem of development a modern computer networks. There are presentation of functions and parameters as a result of this research.

6. REFERENCES

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