

Technical characteristics of MLIS and MNIS NPO 1.0

The names of the proposed software products are: **Multilingual local instrumental system of network purchases optimization**, version 1.0 (MLIS NPO 1.0), and **Multilingual network instrumental system of network purchases optimization**, version 1.0/upc (MNIS NPO 1.0/upc).

1. General characteristics of the products

1.1. Business benefits

Allowing possibility to any interested users faced by the problem of effective using funds for the purchase of goods via the Internet, to quickly solve their tasks of finding optimal strategies for the acquisition of goods.

1.2. Products positioning

Markets of software and network computing services to solve tasks of network purchases optimization.

1.3. Information about users

Potential users of MLIS NPO 1.0 and MNIS NPO 1.0/upc are buyers in online shops.

2. Products overview

Programs **MLIS/MNIS NPO 1.0** are designed to find optimal strategies of investing funds in the purchase of goods via the Internet from their certain set, which are related to many network sellers and are available to the user via the Center of network trade (CNT), which is planned to create for this purpose. At that, there is achieved the maximum value of the a total purchasing worth of acquired samples of goods for which the each goods selected by user is specified utility ratio or purchasing worth of its sample. Allowed to form alternative groups of goods both on their separate categories and on all categories at once. As a result of solving such task on optimizing purchases of goods are formed files of orders which are sent by the user through CNT to corresponding sellers. It is assumed that this program will work with a client database of goods (CDBG), that will be automatically loaded to the user's computer from CNT after issuing by him thereto a request for its creation with required parameters of filtration goods in their universal database, included in the CNT.

MLIS/MNIS NPO 1.0 are multilingual programs. Alternative languages of their interfaces are stored in separate files, called *language shells*. These programs include two such shells: Russian and English, as well as a special program of version 1.0 called "**Генератор языковых оболочек (ГЯО 1.0)** (Generator of language shells (GLS 1.0))", that allows users themselves to create such shells for any languages in which they usually communicate.

MLIS NPO 1.0 is an offline program, designed for a particular user (the lite version of this program is free).

MNIS NPO 1.0/upc ensures the provision of network services to multiple users. This system consists of two parts: one remote module of optimization (MO), which is a part of the Universal processing center (UPC) 9 MNIS 1.0 (that is why the suffix "/upc" is indicated in the name of this MNIS), and numerous automated work places (AWPs) targeted at specific MNIS users. Each such AWP is designed to prepare by a separate user the input data of the tasks to be solved and to output the calculation results, and the synthesis of optimal strategies of acquisition goods takes place in the MO. Information link between AWP and MO can be carried out via the Internet, over the local network or even on the computer bus of a single user of AWP. In the first and second cases MO is located on the network server, and in the third - on the computer of the indicated user. At that, there is ensured the operativeness and full automation of the AWP interaction with this module.

Note. MLIS/MNIS NPO 1.0 are localized versions of the software products of wide purpose "Local/Network instrumental system of expenses optimization (LIS/NIS EO 1.2)", which are designed to find optimal strategies for investing money in acquisition of goods and services.

MLIS/MNIS NPO 1.0 are created on the basis of a new science-intensive information technology of automation of control of discrete technological and information processes (IT AC DTIP), having many uses, the founder of which is the author of these multilingual programs. A set of lite version of MLIS NPO 1.0 can be downloaded from any of two websites of the author: "Promotion center of IT AC DTIP"

(<http://promo.dtip-optim.com/en>) and "Implement. center of IT AC DTIP" (<http://dtip-optim.com/en/main>). There also the user can solve remotely up to 10 test tasks in MNIS NPO 1.0/upc.

Area of use MLIS/MNIS NPO 1.0 is **online trade in the Internet**. Year of release MLIS NPO 1.0 and MNIS NPO 1.0 - 2016 (year of MNIS update to version 1.0/upc - 2018). Place of development - Kiev (Ukraine).

3. Products functions

MLIS/MNIS NPO 1.0 allow to solve tasks of finding such strategies of acquiring goods from their given set, at which is reached the maximum total purchasing value of the acquired samples of goods for a given amount of funds allocated for this purpose.

Input data of a task to be solved:

- the used CDBG;
- amount of money allocated for purchase of goods;
- One of three possible options of creating alternative groups (AGs) of goods:
 - a) AGs are absent;
 - б) AGs are created on separate categories;
 - в) AG are created on all categories at once;
- one of the two possible criteria of utility of a goods samples:
 - utility ratio (relative criterion);
 - purchasing worth, that equals the product of utility ratio of a sample by its cost (absolute criterion);
- upper threshold for utility ratio of a sample (≥ 2 и ≤ 5);
- a list of selected for acquisition goods, for each item of which are specified the following parameters:
 - a goods code and a name of its sample;
 - name of a goods seller;
 - maximum term of a goods delivery to its buyer;
 - cost of a goods sample (including its delivery);
 - number of an alternative group, if this a goods is included in it;
 - a value of used criterion of utility of a goods sample;
 - minimum and maximum numbers of samples of acquired goods in the AG or of samples of the goods, if it is not included in AG;
 - possible sign of sameness of acquired samples of goods included in AG.

In a basis of solving tasks of network purchases optimization is the method of numerical optimization of discrete processes of service, as well as a unique scheme to optimize such processes developed by the creator of MLIS/MNIS NPO 1.0. Before using this method, the task in question is pre-tested for the presence of one of the three possible trivial options of its solving:

- choice of the cheapest goods sample when the allocated amount of money allows to buy only a such sample;
- choice of the minimum possible (i.e. the cheapest) set of goods, when this amount of money will allow only buy a such set;
- choice of a potentially best set of goods, when this amount of money is large enough to acquire the best set of goods.

4. Restrictions

- maximum number of tasks that can be solved with a single CDBG - **10**;
- maximum number of options of delivery goods for all sellers, which are contained in the used CDBG, - **65000** (for lite version of MLIS - **300**);
- maximum number of created alternative groups of goods - **20**;
- maximum number of acquired any samples of goods belonging to each AG, - **10**;
- maximum number of acquired samples of goods of a same type, not included in AG, - **20**;
- allowable number of phase states of an optimizable process - **1000000** (for lite version of MLIS - **20000**).

5. Practical application

MLIS NPO 1.0 and MNIS NPO 1.0 were put into operation in November 2016 (MNIS was updated to

version 1.0/upc in July 2018). Now comes the stage of the search for potential dealers and users of these systems.

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