

P R E S E N T A T I O N

of information technology of automation of control of discrete technological and information processes (IT AC DTIP or Technology)

1. Purpose and scope of Technology

IT AC DTIP or just **Technology** is intended to solve problems of effective control of discrete technological and information processes (**DTIPs**) of various purpose. Each such process, that is included in the scope of Technology, can be either infinite stationary, or limited in time (the process of network and calendar planning), or instantaneous (the process of selecting choices). It is characterized by the following three properties:

- the presence in a system of interacting objects of any physical nature, whose behavior is described by successively changing of discrete and analog states;
- discrete moments of a possible entry of objects to the system, leaving it by them, as well as applying to existing objects of controls (Instant and non-instant) from their limited set;
- additive criterion of quality, which quantitatively describes the behavior of objects in the system.

2. The essence of Technology

In the work [1], published in 1996, its author M.V. Burlakov first put forward the idea of creating IT AC DTIP. The basis of Technology is a uniform scientific methodology of numerical optimization of stationary discrete processes of service (**DPSs**) [2, 3], that provides fulfillment of the following three interconnected procedures:

- reduction of a real initial DTIP to an abstract stationary DPS with a finite number of phase states, which is achieved by applying to the first process of finite-dimensional approximation (incrementing or Markov approximation) and its possible subsequent regeneration (in case of its limitation in time or instantaneousness);
- synthesis of optimal tabular strategy of control (**TSC**) of created DPS, which is reached by applying to it one of known schemes of recurrent optimization [2] (in the presence of incrementing the laboriousness of performing this procedure can be adjusted by changing an increment value);
- evaluation of real effectiveness of the found TSC applied to the initial DTIP, the need for which arises due to unaccounted factors during synthesis of the strategy or its possible improvement at the stage of its application.

The implementation to life of IT AC DTIP will provide a large economic and social effect from the use of highly effective strategies of control of discrete processes in various areas of human activity.

3. Areas of the practical use of Technology

Below are listed alphabetically possible areas of practical use of IT AC DTIP. Asterisks mark those of them, for which are already created software tools for optimizing discrete processes of relevant purposes. Those areas include:

- 1) * budgeting based on program-target planning;
- 2) * customer service in catering (particularly, in restaurants);
- 3) * delivery of a passenger by public transport to his destination;
- 4) * expenditure of money to various goods and services;
- 5) impatient customers service;
- 6) * investment of money in different sources of income;
- 7) loading and unloading operations;
- 8) maintenance of calls by emergency city services;
- 9) * maintenance of geographically distributed objects;
- 10) * network planning in project management;
- 11) * planning of business operations in production and business;
- 12) processing of workpieces on machines with changeover;
- 13) * purchase of housing;
- 14) reconstruction of existing facilities;
- 15) repair of process equipment;
- 16) storage and processing of perishable products;
- 17) * trade in real estate;
- 18) * trade online;
- 19) transmission of digital messages in communication networks;
- 20) * transportation.

4. Prospects of Technologies

Commercial, social and political prospects from the implementation of IT AC DTIP are caused by the following

objective factors:

- widespread of DTIPs in various applied fields, as well as great practical needs in their effective control;
- high science-intensiveness of Technology, existence of the scientific methodology and the person (M.V. Burlakov), who owns this know-how and is ready to take upon himself the scientific and practical leadership in works on its wide practical inculcation;
- a network character of the essence of Technology itself and the mechanism of its implementation (*see below*);
- absence nowadays worldwide of a similar technology.

5. Implementation to life of Technology

The process of introducing to life of IT AC DTIP consists of two stages. In the first of them is created a network universal program toolkit (**UPT**) on optimizing control of narrow classes of the most common DTIPs which occur in various areas of human activity (*see above*). To the UPT is provided through Internet a mass paid access of network users to solve their tasks of optimizing control of specific discrete processes. All calculations will be performed here in a network processing center (**NPC**). At that, preparation of the input data of tasks to be solved and output of results of their solution will be used with the help of automated work places (AWPs), distributed free among the interested users, which are the means of access to NPC.

To ensure the rapid implementation to life of this UPT without the involvement of a lot of money for that, it is proposed to use for this purpose the principle of network marketing. The essence of it in this case is to create a network of dealers who will be given a right to enter into direct commercial agreement with potential users in various application areas on solving optimization tasks (Fig. 1).

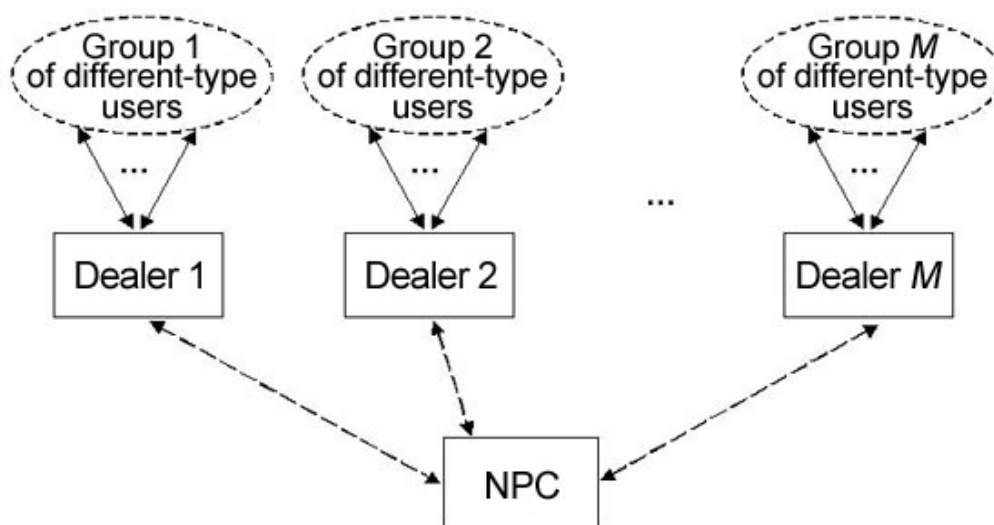


Fig. 1. Structure of the dealer network for implementation of UPT for DTIPs

Between the side of developers and the dealers will also be concluded contracts, in which, in particular, is specified a tariff at which the calculations are performed. Thus, each dealer will have an incentive to find their clients and to conclude an agreement with them on mutually beneficial terms. This will ensure the promotion of this UPT via Internet among the international community of interested users.

In the second stage of implementing Technology is created a specialized production company on its inculcation and widespread promotion. It will consist of the center of toolkit development (**CTD**) and the network of centers of control automation (**CCAs**) in directions of Technology introduction [1] (Fig. 2).

The purpose of functioning of a separate CCA is the development and implementation of highly effective strategies of DTIPs control in a particular application area. CTD and CCAs will have the following interconnection between them: CTD develops optimizing tools, as well as mathematical models and algorithms of optimization, and CCA provides to CTD necessary information about the tasks to be solved, that allows to create new program systems and develop software for those models of DTIPs, which optimization is impossible by using the available program toolkit.

Such approach in the organization of work of development and implementation of IT AC DTIP allows in the shortest time to master the market of all those tasks of ensuring the efficient control of DTIPs, for which solution is purposed Technology.

A necessary condition for the creation of the abovementioned company is to have a team of associates that will establish it. Each member of this team will be responsible for certain activities of the company. The presence of an investor here is highly desirable, but not necessary, because Technology is a network one and we have already created the UPT for optimizing DTIPs of many purposes.

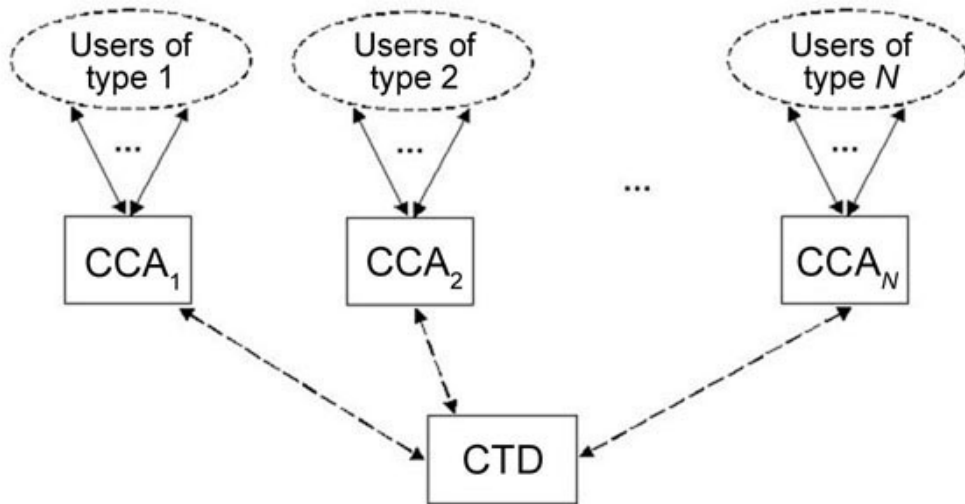


Fig. 2. Structure of the production company for implementation of IT AC DTIP

6. Current results of Technology development

To date, the following main results on IT AC DTIP are obtained:

- there has been developed a uniform scientific methodology of Technology [2, 3];
- there has been elaborated one application direction of Technology relating to the effectiveness of standard investments [4];
- there has been issued by the publishing house «Університет "Україна"» the monograph by M.V. Burlakov on the basics of IT AC DTIP, which can be used in three ways: a) as a tutorial for training specialists on Technology in higher education institutions of corresponding profile; b) as a practical guide for development of effective strategies of controlling discrete processes for various purposes; c) for solving specific tasks on this subject with the help of the software tools, described in the book and applied to it [5];
- there has been prepared a training course on the basics of Technology, which was read twice in the Gorlovka regional Institute (GRI) of the Open International University of Human Development "Ukraine" in the academic years 2010-2011 and 2011-2012.
- there have been developed nine multilingual local and network instrumentation systems on optimizing control of DTIPs for various purposes: [MLIS/MNIS MBO 1.0](#), [... GAO 2.2](#), [... IO 2.2](#), [... EO 1.3](#), [... HIO 1.2](#), [... RIO 1.0](#), [... NPO 1.0](#), [... TO 1.6](#) and [... PTPDO 1.2](#). They allow for ordinary and network users to operatively solve such tasks in any languages convenient for them in the following application areas: 1) budgeting of the Ministry; 2) network planning; 3) standard investments; 4) expenses; 5) investment in housing; 6) investment in real estate; 7) online shopping; 8) transportation; 9) delivery of a passenger by public transport;
- there has been created the [Universal Processing Center](#) of nine above-mentioned MNISs (**UPC 9 MNIS 1.0**) with the interface in English and Russian languages, which is designed for centralized solution by any users via Internet or on a local network of the tasks on optimizing control of discrete processes for various purposes;
- there have been developed two multilingual programs for optimizing remote and ordinary orders of customers in a restaurant: [MP OROR 1.1](#) and [MP OOR 1.2](#);
- on the basis of IT AC DTIP there have been offered the concepts of creating four specific innovative technologies used in the following application areas: 1) online trade, 2) trade in real estate, 3) restaurant business and 4) project management (the first two of them are perfect), and has been developed the key software tools for this technologies (see above);
- there have been created two website: "[Promotion center of IT AC DTIP](#)" and "[Implementation center of IT AC DTIP](#)".

7. Strategic plan for implementation of Technology

Two alternative versions of this plan are proposed:

- sale of the whole informational-software package of materials on the introduction of IT AC DTIP, presented in this presentation, to a some well-known manufacturing company in the field of information technologies, which wishes to implement Technology all over the world and thereby become the world leader in the sphere of controlling discrete processes for various purposes. For this, the search for such companies will be carried out in the near future;
- establishment together with the Technology founder of a new specialized production company for

implementation to life of IT AC DTIP. To do this, the search for its potential cofounders will be made in the near future.

8. Major publications on Technology

1. *Бурлаков М.В.* Проблемы автоматизации управления дискретными технологическими и информационными процессами (***Burlakov M.V. Problems of automation of control of discrete technological and information processes***) // Автоматизация и современные технологии (Automation and modern technology). — 1996. — № 6. — С. 16—23.
2. *Бурлаков М.В.* Ситуационное управление в системах массового обслуживания (***Burlakov M.V. Situational control in queuing systems***). — Киев: Наук. думка, 1991. — 160 с.
3. *Синицын И.П.* Основы автоматизации управления дискретными технологическими и информационными процессами (***Sinitsyn I.P. Basics of automation of control of discrete technological and information processes***). — Киев.: Наук. думка, 2005. — 163 с.
4. [Бурлаков М.В. Как достичь эффективности инвестиций](#) (***Burlakov M.V. How to achieve efficiency of investments***). — Москва: Экономика, 2010. — 174 с.
5. [Бурлаков М.В. Основы технологии автоматизации](#) управления дискретными технологическими и информационными процессами (***Burlakov M.V. Basics of technology of discrete technological and information processes control automation***). — Киев: Университет "Україна", 2010. — 561 с.

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