

the advantage for economic development of Krasnoyarsk region, expansion of trade and economic relations not only in the sphere of raw materials, but also in the field of industry, tourism, formation, investment and innovative sphere.

Researches and conclusions of the given work are lead to the concrete recommendations about the increase of efficiency of the foreign trade activity, the analysis of new potential ways of the foreign trade cooperation between Krasnoyarsk region and China, and give possibility of

application of its positions in activity of the Chinese and Russian foreign trade enterprises.

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PROCESS PROGRAMM REALIZATION OF THE CAPITAL REPRODUCTION FUNDS

Program realization of simulated model of capital stock reproduction in PowerSim Studio is described in this article.

Keywords: reproduction, simulated model, capital reproduction funds.

Wide development of automation of management depends on constantly increasing complexity and multiple-factor problems of reproduction management of a fixed assets at different levels of an economic management, necessity of processing thereupon huge weight of the information at high accuracy, labor-output ratio, tight timetables of carried out calculations and recurrence of their carrying out.

Now at the machine-building industry enterprises ERP-class automatic control system, and a variety of the dedicated systems created specially for management by separate processes (MES, SCP, EAM etc.) are used. The ERP-system carries out the central role, consolidating data on all activity of the company, the system is responsible for the finance, logistics, relations with suppliers and clients, human resource management, granting of the consolidated statements on key parametres of activity of the company to leading managers. The ERP-system integrates specialized decisions – MES carries out an operational administration manufacture, SCP is engaged in planning and optimization of a chain of deliveries and manufactures, EAM operates a fixed assets.

However there is a number of processes which cannot be automated by means of traditional decision-making systems (ERP-class). ERP systems don't allow to consider multi-variant approach of decisions of problems, risks and uncertainty, to carry out scenario planning, to do conclusions about stability of systems, to reveal unevident dependences and time logs between investigated characteristics.

The systems of decision-making support created on the basis of the theory of system dynamics will be successfully applied in this case.

While using the theory of system dynamics company activity is described in the form of mathematical model in which all business problems and process are represented as the system of the interconnected estimated indicators. Possible directions of development different processes in the company allow to reveal and analyze creation of the similar visualised model.

It is possible to estimate profitability of investment projects, to choose priority directions of business development, to analyze influence of external macroeconomic factors on profitability of projects, to estimate influence of risks-effects on results of activity by means of dynamic modeling. Also the theory of system dynamics allows to create imitating models of industrial systems for an estimation of possible consequences of accepted decisions. So it is possible to optimize material, financial and information flows of the company (both on strategic, and on operational levels) to carry out their consolidation on the enterprises and business segments.

Model development begins with the analysis of the enterprise activity. The descriptive model of the enterprise is built under expert opinions, on historical data, under shown requirements of a management and the future users of model. So-called cognitive model reflecting relationships of cause and effect and a set of mathematical dependences between various sizes is created. Simultaneously a lot of already existed at the enterprise formulas, tables etc are actively used.

The consolidated mathematical model which is realized by means of visual programming is built. The estimated model is created at this stage. Model verification is made by means of testing examples, checking of historical data, using of expert tests.

Program realization of process of capital stock reproduction on the basis of a method of system dynamics is considered in the article.

At the first stage the description of the basic reflective contours of relationships of cause and effect arising in the course of capital stock reproduction is given.

Basis of imitating model of the equipment reproduction of the enterprise in the natural form the reflective contour of a feedback “the Equilibration under the influence of a log of decisions realization”, allocated with a framework (makes fig. 1). It is interpreted as follows. The size of necessary equipment capacity of the enterprise must

correspond to the production program. At production program change it is necessary to make of the decision on respective alteration and capacity of the equipment. It can be increase in capacity at the expense of acquisition of the new equipment. It is inexpedient to get the equipment at once. It is necessary to wait, as the increase in quantity of the equipment in operation can be possible, the capacity at the expense of being under repair and installation of machine tools is possible either. Such delay is a log of adaptation which allows to adapt fund for changes of the factors

defined by the decision-making procedure. The considered decision will affect a current production capacity level of the enterprise not at once, it will affect with the delay in one period of modeling. The executed specification of this contour is presented down below.

Basis of model of capital reproduction funds in the cost form is also the reflective contour of a feedback “the Equilibration under the influence of a log of realization of decisions” (fig. 2). It is described as follows. The size of the monetary fund necessary for replacement and repair of the

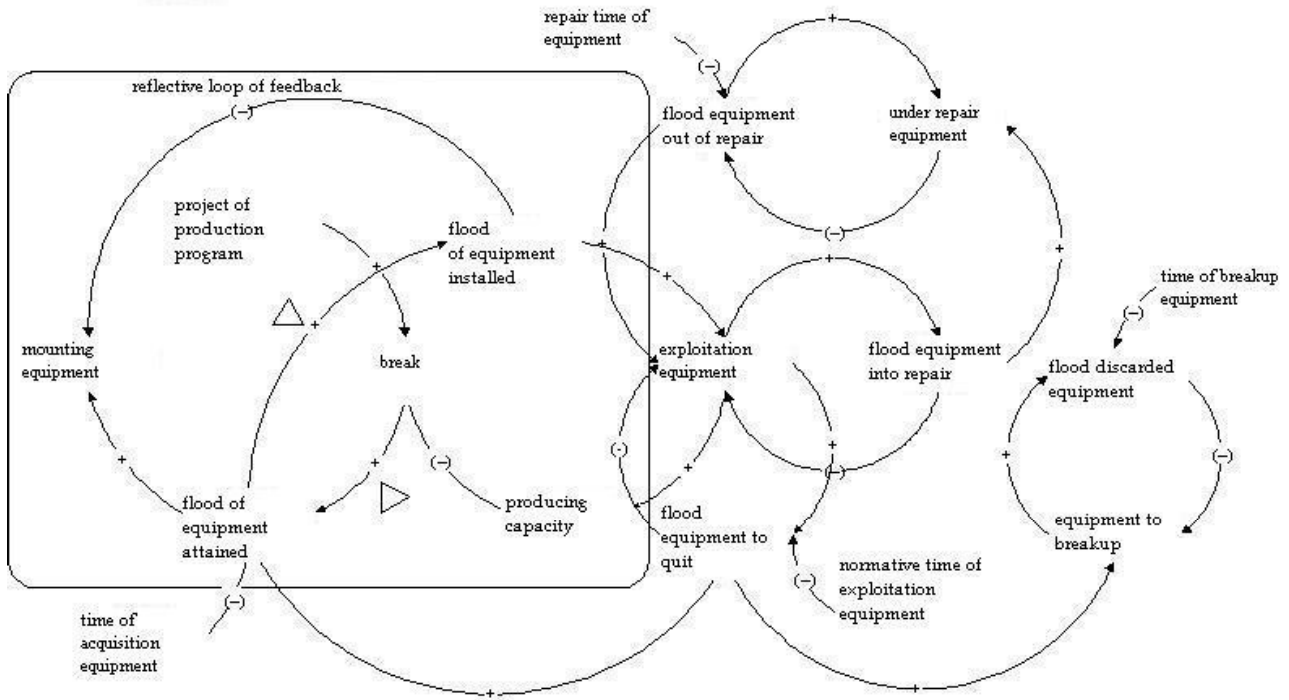


Fig. 1. Ideogram relationships of cause and effect of reproduction in the natural form

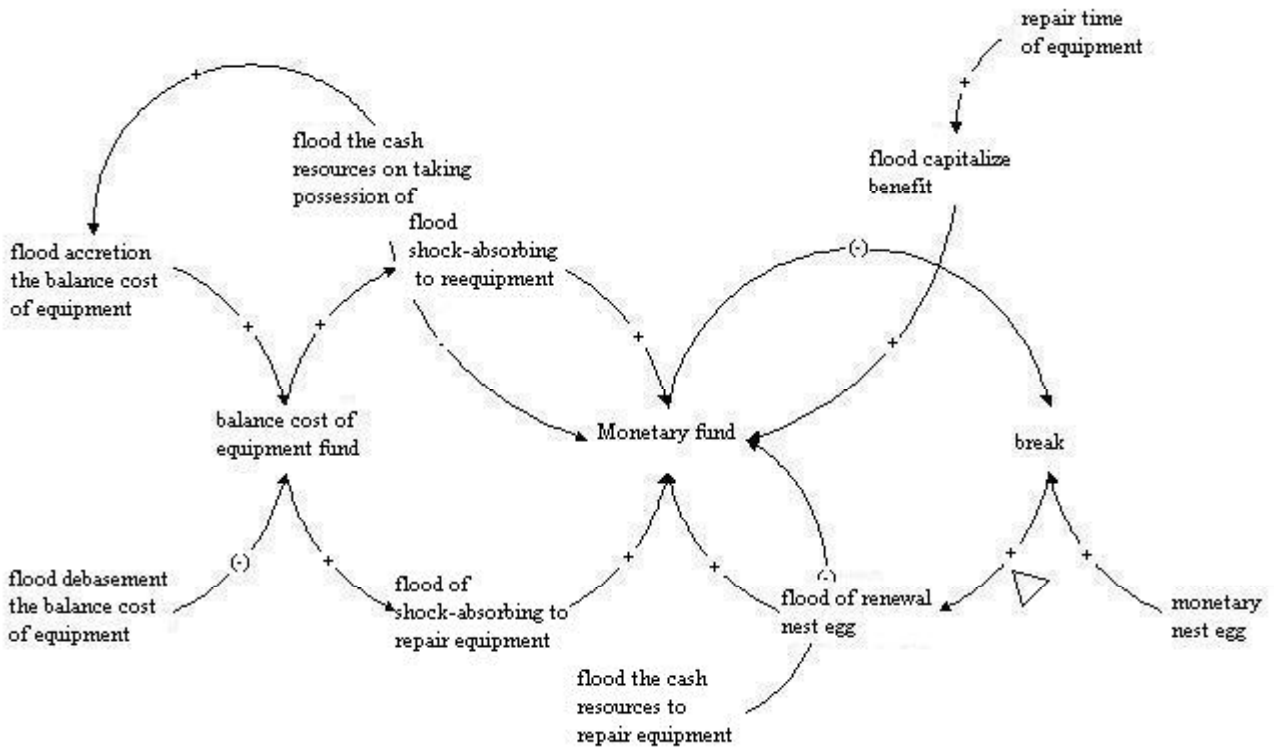


Fig. 2. Ideogram relationships of cause and effect of reproduction of the equipment in the cost form

equipment, must correspond to current and strategic requirements of the enterprise. At insufficient level the monetary fund should replenish as at the expense of internal (amortization, profit etc.), it can also happened at the expense of external (credits, budgetary funds etc.) sources. But it is inexpedient to borrow missing money resources on acquisition of the new equipment or repair of the available at once, as receipt of money resources from internal sources is possible: depreciation charges or deductions from profit. Such delay – an adaptation log – allows to adapt fund for changes of the factors defined by the decision-making procedure. The made decision will affect current level of monetary fund of the enterprise not at once, it will affect with a delay in one period of modeling time.

The contours of a feedback presented above are the cores in model, other contours ensure functioning.

At the second stage program realization of process of capital stock reproduction is carried out.

The most widespread software products used for realization of system dynamics models are PowerSim and Ithink.

PowerSim and Ithink are compact, object-oriented packages of applied programs with the Desk-Top-external interface. They provides graphic, computing and information support to high level system analysis procedures of difficult processes of the organization of management, business, the finance, a policy, etc.

The PowerSim possesses the most developed tools of difficult processes modeling of the organization in comparison with Ithink. Besides, the optimization tool of modeled processes is built in into operational environment of package. As package PowerSim is integrated into widespread system (class ERP) SAP. Therefore the given software product has been chosen for realization of imitating model of management of capital stock reproduction.

The imitating model of the basic production assets reproduction consists of two submodels of co-operating share streams: submodels of reproduction of the basic production assets in the natural form (fig. 3, 4) and submodels of capital stock reproduction in the cost form (fig. 5). The basic is a reproduction submodel in the natural form.

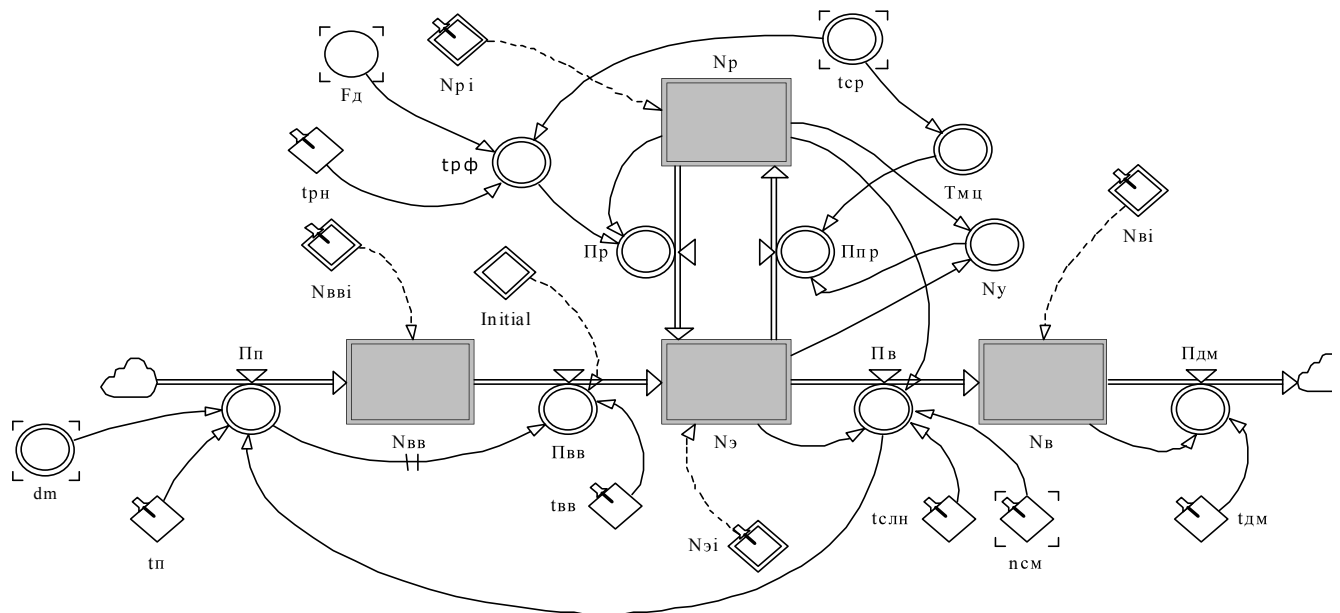


Fig. 3. Ideogram the auxiliary contour, describing stages of reproduction of the equipment in the natural form

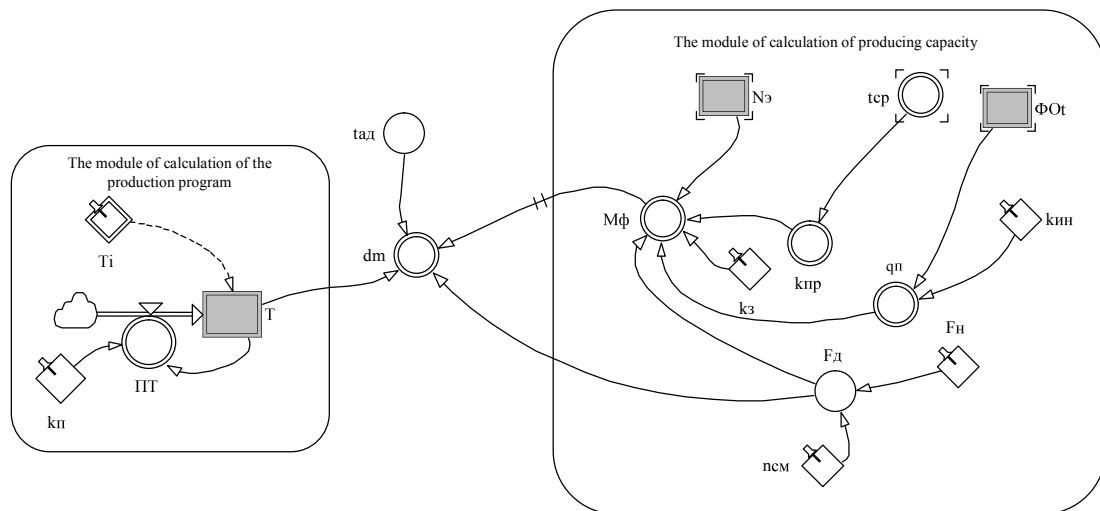


Fig. 4. Ideogram the basic contour of reproduction of the equipment in the natural form

In conclusions the constructed imitating model of reproduction of the equipment is skeletal (base) model. To this model it is possible to add various submodels for calculation of other characteristics or parameters. Functioning of skeleton model of the equipment

reproduction of the enterprise will be for these parameters a source of the initial information which can be transformed to any necessary kind. Also it is necessary to notice, that the developed model can be adjusted actually on any type of the enterprise, therefore it is possible to consider it typical.

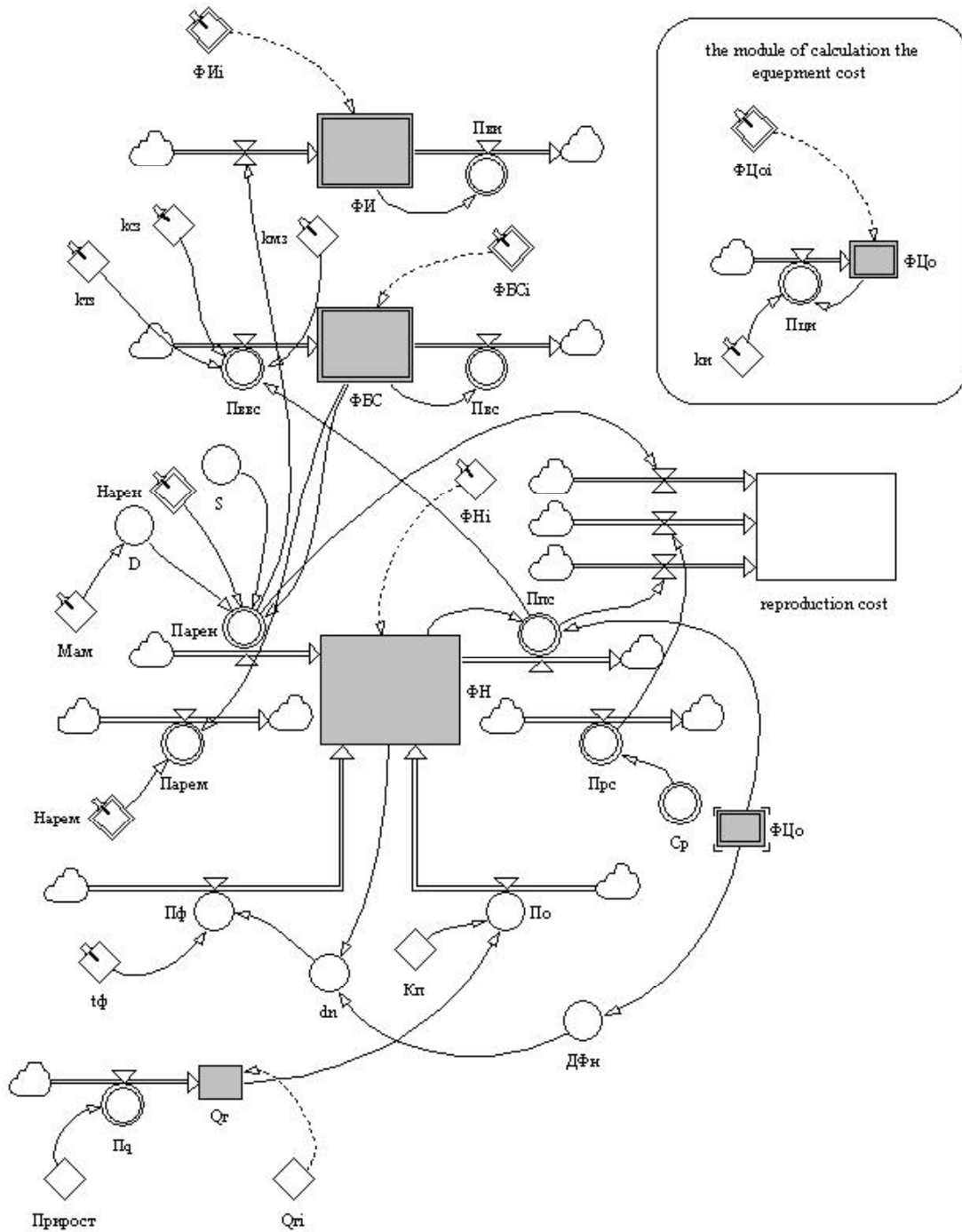


Fig. 5. Ideogram equipment reproduction in the cost form