

THE STRUCTURE OF THE MATHEMATICAL DESCRIPTION OF INNOVATION STRATEGY OF SERVICES SPHERE DEVELOPMENT

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This article deals with the problem of the possible structure of design of innovative development in the sphere of service. The author points out a special program-aimed conception of design, which should be combined with a hierarchical principle of construction of mathematical models. The special features of this conception are given and considered thoroughly. The author comes to the conclusion that such system of models can be the instrument of taking the decisions, when we deal with the management of NIOKR.

It is necessary to imitate service department dynamics in order to know processes in service sphere development with the aim of the most effective placement of innovation projects in departments. It will help solve tasks of resource allocation in such a way where innovation projects cause new resources to be put in ever more effective projects. The process of making the algorithm of dynamics presume the usage of enough aggregated exponents and models of process of making the algorithm build the macro-economical structure of service sphere development. Modeling of such strategies is a tool of managerial decisions what let us optimize different patches and the trends and proportions of the development.

The building of the effective system of innovation development of service sphere presumes the development of formalized methods of making decisions in management and analysis of these decisions and consequences. The basis of such methods is economic-and-mathematic models that imitate the main dynamic processes of branch development and also the system of valuations in criteria of variants of management. The crucial meaning has to be given to the choice of the concept of model building because of the exceptional complexity of the task of modeling of innovative cluster development of the regional economy. The most effective can be the concept of management in combination with the hierarchical principle of building of mathematical models of systems of management. In accordance with program-and-targeted concept on a basis of development, the plan was put into the targeted pro-

gram for their development and its aim is modernization of the service sphere. The second group of targets should characterize economic effectiveness of usage of material and human resources in a branch and also effectiveness of investment to innovation development in the sphere of service and scientific and research developments and production sphere.

We can notify some specific peculiarities of functioning of the system of these projects.

1. Necessity of resources is different as in accordance with the character of service and its value for the end consumer. Resources that are necessary for total satisfaction in the service sphere are greater than those that this sphere has.

2. The system is distinguished from the other systems by a deeper change of the range of the important characteristics in accordance with factors characterizing scientific-and-technical process, strategy of main funds replenishment, process of personnel preparation and etc.

3. The system functions in conditions of a high level of uncertainty of risks with many external causes.

4. The system is related intimately with the others systems of management.

All these abovementioned peculiarities of functioning of the system allow us to formulate the basic requirements to use mathematical models. However because of the complication of this system we can consider just typological structure of model of high level for the service sphere. We can formulate the requirements to model of high level.

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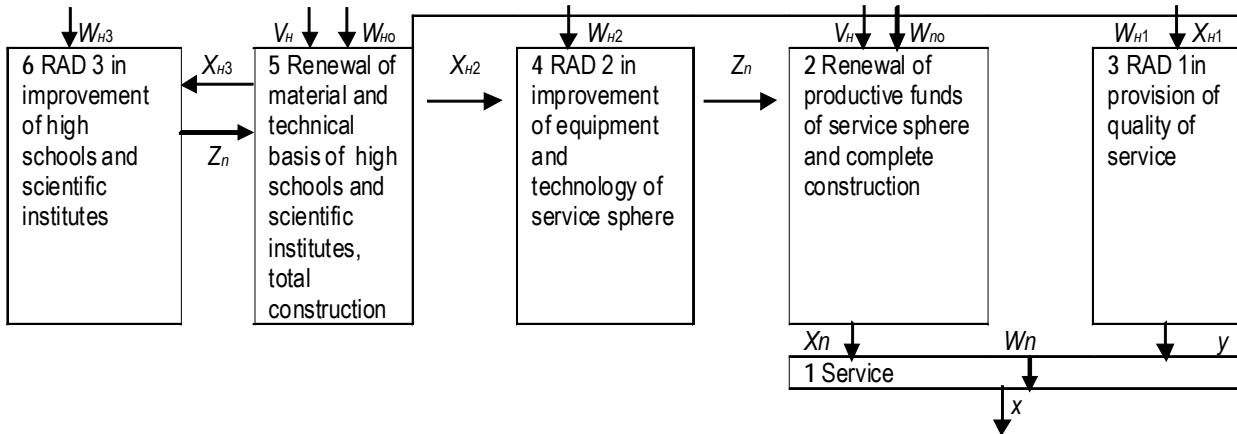


Fig. Enlarged block-scheme of mathematical model of system of development

1. The model should operate with aggregated data to provide, firstly, realization of mathematical models in a regular life and secondly, the stability of modeling results in conditions of lack of information.

2. The model should fit for use in a system of development that is working in dialog mode. This requirement means that it is necessary to include in the model some regular parameters and development of algorithmic provision of targeted programs of industry development.

3. The model should reflect the process of realization of targeted programs in conditions of lack of resources and also should give an estimation of having and necessity resources.

4. The model should reflect the processes of dynamics of resources that characterize the development of scientific-and-production basis of branch.

The choice of adequate and the most effective process of resource distribution have to be a basis for formation of complex of inter-branch or providing programs of service sphere.

Counting the above-mentioned, we can offer the following enlarged structure of mathematical model of development (see figure). We accept that:

x - stage of production of services in a service sphere;

y - stage of integrated program in Research and Advanced Development sphere in providing qualified service;

$X_{\pi}, X_{H1}, X_{H2}, X_{H3}$ - conditions of productive funds in different branches of service sphere (Π - productive component of the sphere, H - scientific component);

$W_{\pi}, W_{H1}, W_{H2}, W_{H3}$ - expenses on payment and materials in departments of service sphere;

V_{π}, V_H - expenses on total construction in productive and scientific components of service sphere;

$W_{\pi O}, W_{HO}$ - flow of facilities for renewal of productive funds in production of services and Research and Advanced Development (RAD);

Z_{π}, Z_H - factor of scientific-and-technical progress and RAD.

Mathematic model of development is adequate to the above-mentioned requests. This model can become a tool for formation of common strategy of branch innovative development for planning, implemented with the rational investment of assets to Research and Advanced Development. Formation of such a strategy assumes that there is a choice of some completed state of system. It is really difficult to make this choice because of lack of information - it would be reasonable to enlarge the planning period by another 20 years.

1. *Erokhina L.I.* Bashmachnikova E.V. Forecasting and planning in the service sphere. - M.: KNORUS, 2004.

2. All-Russian classificatory of public services (edition N 1/95, proved by State Standard of Russian Federation 11.09.1995, N 2/95, proved by State Standard of Russian Federation 20.11.1995).

3. *Avanesova G.A.* Service activity.- M., 2006.

4. *Malafeev A.A.* Mathematical modeling as a method of positive economic science. Samara, 2006.