

COMPLEX USE OF INNOVATION POTENTIAL AS THE BASIS OF THE RUSSIAN INDUSTRIAL ENTERPRISES DEVELOPMENT

© 2008 S.V. Kochetkov, O. V. Kochetkova*

Key words: innovation potential, industrial enterprises, efficacy of innovations, ratios of innovation activities effectiveness, production system of innovative type, conditions for implementation of innovation projects, innovative products, innovation technology, innovation development.

We studied the complex use of innovation potential which supposes both consideration of peculiarities of innovation projects realization by an enterprise and the depth of the changes which happen at an enterprise as the result of innovations use. The system of characteristics (ratios) of innovation activities at an enterprise was formed and the conclusion was made that realization of innovation potential is the basis of stable development of the Russian industrial enterprises.

Now the use of the innovation potential of an industrial enterprise stipulates the effectiveness of several innovation projects realization. At the same time the effectiveness depends on the state and increase of the innovation potential of an enterprise, the basis of which are human, production and investment resources more or less inherent in each innovation project¹.

The study of simultaneous realization of several innovation projects is stipulated by a number of problems²:

- ◆ of scientific and technical complex in general;

- ◆ of saving resources;

- ◆ of the result effectiveness increase.

- ◆ In this connection we will stress some peculiarities of simultaneous realization of innovation projects at an enterprise:

- ◆ different levels of implementation of this or that innovation;

- ◆ different forecasts of realization of this or that innovation project;

- ◆ effectiveness of realization innovation projects is different.

These peculiarities make it possible to say that theoretical aspects of simultaneous realization of innovation projects must be stipulated by the choice and explanation of the criteria of choosing an optimal innovation project introduced at an enterprise.

To our point of view the task is to define the rank of this or that innovation project. It is important to stress the fact that there is no unified definition of "introduction of innovations" and it leads both to terminological disagreement and disagreement in the estimation of the level, the number and the volume of introduc-

tion, the ways of organization of planning and innovation cost account, in the methods of innovation potential effectiveness estimation, stimulation of use, time limits and scale of introduction.

All the above mentioned stipulates the existence of different levels of introduction of the innovation activities results in production³:

- ◆ the use of the results of scientific research in other scientific researches;

- ◆ the use of the results of scientific research in laboratory processes and experimental samples;

- ◆ introduction of the results of construction experiments in pilot production and low tonnage processes;

- ◆ testing the results of scientific research and samples in serial production;

- ◆ large - scale distribution of technical innovations in production and saturation of the market with the finished products.

To our point of view the above-mentioned guidelines of innovations introduction were not studied in detail. For this reason they are not universal for the estimation of innovation potential of an industrial enterprise. So it is logical to see introduction of innovations as a process involving the complex of organizational and technical measures, decisions aimed at the use of innovations in production. It is also creation of conditions for innovations realization aimed at the replacement of equipment, technologies, management systems. This process involves certain costs.

So, the source of innovation potential increase is innovation activity stipulating transformation of the types and models of economi-

* S. V. Kochetkov, Candidate of economic sciences, associate professor of the Belgorod State University; O. V. Kochetkova, the teacher of the Belgorod State Technological named after V.G. Shuhov.

cal activities of industrial enterprises and the changing of their organizational structure type. In such a situation the system of principles of innovation changes management should become objective premise for the formation of optimal conditions for the development of domestic enterprises.

Innovation changes are the transition from one state of an enterprise to another under the influence of the external and internal environment factors ⁴.

The economic essence of the functional principles of innovation changes management is in realization of the rules of innovation activities of an enterprise, the base of which is the depth of changes when using innovations. So, it is reasonable to distinguish the following levels of the depth of the changes ⁵:

1) innovations of zero level – regeneration (restoration) of the initial characteristics of production system, preservation and renewing of its functions;

2) innovations of the first level – change of quantity characteristics of production system;

3) innovations of the second level – regrouping of the parts of production system aimed at the improvement of its functioning;

4) innovations of the third level – adaptive changes of the elements of production system;

5) innovations of the fourth level – new вариантный, the simplest quality change breaking the limits of adaptive changes;

6) innovations of the fifth level – new generation (all the characteristics or the majority of them changes but structural concept is preserved);

7) innovations of the sixth level – new type (quality change of the initial characteristics of the system, change of initial concept without changing functional principle);

8) innovations of the seventh level – new family (the most important change of the functional characteristics of the system and its part which changes its functional principle). The studied levels help to establish conceptual guidelines of the innovation changes management system functioning on the level of an enterprise (innovation development) which include:

- ◆ formation of methodological approach to innovation activities of an enterprise;
- ◆ admission of innovation priority as the base of innovation system of an enterprise;

- ◆ development of criteria model of optimal innovation decisions making;

- ◆ defining the structure of innovation risks;
- ◆ formulation of principles of innovation system building;

- ◆ creation of functional level model of innovation system;

- ◆ revealing quality parameters of innovation system characteristics formation;

- ◆ realization of conditions and factors of innovation behaviour of an enterprise;

- ◆ choosing the form of innovation development of an enterprise;

- ◆ provision of innovation security;

- ◆ management of resistance to innovation changes.

It is necessary to take into consideration some peculiarities of innovative activities of an enterprise:

- ◆ formation of innovation behaviour;

- ◆ creation of innovative infrastructure;

- ◆ innovation security.

This methodical approach allows forming the system of ratios of the innovative activities of an enterprise:

- ◆ ratios of innovation production system functioning effectiveness;

- ◆ ratios of innovative technologies use effectiveness;

- ◆ ratios of innovative products effectiveness;

- ◆ integral ratio of innovation activities effectiveness.

The threshold values of these ratios are achieved as a result of the analysis of the activities and interviewing the directors of the industrial enterprises of the Belgorod region (JSC Belgorod Plant ZHBK, JSC Belgorod Abrasive Plant, JSC Energomash, JSC Construction Materials and some other enterprises)⁶.

1. The coefficient of the inner effectiveness of the production system of innovation type is calculated with the use of the formula:

$$K_{\text{внутр.эф}} = \frac{ИТ_{\text{сам}}}{ИТ_{\text{общ}}},$$

where $K_{\text{внутр.эф}}$ - the coefficient of inner effectiveness; $ИТ_{\text{сам}}$ - the number of innovation technologies developed by the enterprise;

$ИТ_{\text{общ}}$ - the total number of technologies used at the enterprise.

The threshold value equals or exceeds 0.05.

2. The coefficient of the external effectiveness has the following formula:

$$K_{\text{внешн.эф}} = \frac{ИТ_{\text{стор}}}{ИТ_{\text{общ}}},$$

where $K_{\text{внешн.эф}}$ - coefficient of external effectiveness of the production system of innovation type;
 $ИТ_{\text{стор}}$ - the number of external innovation technologies used by the enterprise.

The threshold value equals or exceeds 0.07.

3. The coefficient of the effectiveness of own innovation technologies has the formula:

$$K_{\text{ЭСИТ}} = \frac{О_{ИП}}{О_{\text{общ}}},$$

where $K_{\text{ЭСИТ}}$ - coefficient of own innovation technologies effectiveness; $О_{ИП}$ - the volume of innovation products made with the use of own innovation technologies; $О_{\text{общ}}$ - the total volume of the products made by the enterprise.

The threshold value equals or exceeds 0.1.

4. The coefficient of external innovation technologies effectiveness has the formula:

$$K_{\text{ЭСМИТ}} = \frac{О_{ИП\text{стор}}}{О_{\text{общ}}},$$

where $K_{\text{ЭСМИТ}}$ - coefficient of external innovation technologies effectiveness; $О_{ИП\text{стор}}$ - об the volume of innovation products made with the use of external innovation technologies.

The threshold value equals or exceeds 0.15.

5. coefficient of the total effectiveness of innovation products has the formula:

$$K_{\text{ПЭИП}} = \frac{О_{\text{ЕИ}}}{О_{\text{И}}},$$

where $K_{\text{ПЭИП}}$ - coefficient of the total effectiveness of innovation products; $О_{\text{ЕИ}}$ - the volume of single innovative products; $О_{\text{И}}$ - the total volume of innovations.

The threshold value equals or exceeds 0.6.

6. Coefficient of conjugate effectiveness of innovative products has the formula:

$$K_{\text{СЭИП}} = \frac{О_{\text{СИ}}}{О_{\text{И}}},$$

where $K_{\text{СЭИП}}$ - coefficient of conjugate effectiveness of innovative products; $О_{\text{СИ}}$ - the volume of conjugate innovations made at the enterprise.

The threshold value is equal or less than 0.4.

7. Coefficient of the own used innovation technologies effectiveness has the formulas:

$$K_{\text{ЭСИИТ}} = \frac{О_{\text{СИИТ}}}{О_{\text{общРИТ}}},$$

where $K_{\text{ЭСИИТ}}$ - coefficient of effectiveness of the own used innovation technologies; $О_{\text{СИИТ}}$ - the volume of the own used innovation technologies; $О_{\text{общРИТ}}$ - the total volume of developed innovation technologies.

The threshold value equals or exceeds 0.3.

$$K_{\text{ЭСИИИТ}} = \frac{О_{\text{СИИТ}}}{О_{\text{общНИТ}}},$$

where $О_{\text{общНИТ}}$ - the total volume of innovation technologies which are not used.

The threshold value equals or exceeds 0.2.

$$K_{\text{ЭСИИИИТ}} = \frac{О_{\text{СИИТ}}}{О_{\text{общНЕЗИТ}}},$$

where $О_{\text{общНЕЗИТ}}$ - the total volume of not finished innovation technologies.

To achieve the best result from the joint realization of innovative projects the following classification is suggested:

- ◆ projects with the finished samples – the base of innovation programmes market;
- ◆ priority objects nearly finished aimed at the solution of key problems (3-5 years);
- ◆ Fundamental and search long-term (5-10 years) key problems of innovation development (estimation and revealing of break-through directions and technologies).

The following conclusions can be made:

- ◆ innovation project can be considered the form of realization of the enterprise innovation potential;
- ◆ the joint realization of innovative projects is the most effective if an enterprise has innovative level of development;
- ◆ the key to solving the problems of joint realization of innovative projects is in choosing such a portfolio of innovation projects which will provide minor changes of innovation potential of an enterprise as a whole as different innovation projects give different abilities for realization what stipulates the development of the model of innovation potential ⁷.

The main conclusion is that the development of the Russian enterprises depends upon the state, increase and use of their innovation potential which defines their production effectiveness in general.

¹ *G.S. Gamido, V.G. Kolosov, N.O. Osmanov.* The basics of innovatics and innovation activities. Collection of articles, Polytechnics, 2000., p. 323.

² *V.A. Plehanov.* Planning and economic estimation of innovation activities in construction // Bulletin of the Samara State University of Economics, Samara, 2007. № 8 (34). p. 96-99.

³ *F. F. Glisin, O.N. Loseva.* Tendencies of innovation activities of the Russian industrial enterprises // Innovations. 2003. № 2-3. p. 53-57.

⁴ *S.V. Kochetkov.* Estimation of innovation potential of industrial enterprises // Economist. 2006. № 5. p. 34-38.

⁵ *S.G. Polyakov, I.M. Stepanov.* The model of innovation development of an enterprise // Innovations. 2002. № 2-3. P. 36-38.

⁶ Social and economic situation in the Belgorod region and the regions of the Central Federal District in 2007. Belgorod, 2008. p.67 .

⁷ *R.A. Fathutdinov.* Production management. M., 2002. p.472.