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## INTEGRATION OF MANAGEMENT OF INNOVATIVE ACTIVITY IN THE DEVELOPMENT STRATEGY OF THE ENTERPRISE BY MECHANICAL ENGINEERING AND METALWORKING

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*Забарна Е.М., Танасенко М.О., Скрипник М.Г. Інтеграція системи управління інноваційно-інвестиційною діяльністю в стратегію розвитку підприємств машинобудування та металообробки.*

В статті проаналізовано зміст, форми та методи системи управління інноваційною діяльністю в сучасних умовах господарювання. Запропоновано методичний підхід до інтеграції системи управління інноваційною діяльністю в стратегію розвитку підприємства.

*Ключові слова:* управління, інтеграція, інноваційний розвиток, система управління, стратегія розвитку підприємства, мережевий підхід

*Забарная Э.Н., Танасенко М.О., Скрипник М.Г. Интеграция системы управления инновационно-инвестиционной деятельностью в стратегию развития предприятий машиностроения и металлообработки.*

В статье проанализированы содержание, формы и методы системы управления инновационной деятельностью в современных условиях хозяйствования. Предложен методический подход к интеграции системы управления инновационной деятельностью в стратегию развития производства.

*Ключевые слова:* управление, интеграция, инновационное развитие, система управления, стратегия развития предприятия, сетевой подход

*Zabarna E.M., Tanasenko M.O., Skripnik M.G. Integration of management of innovative activity in the development strategy of the enterprise by mechanical engineering and metalworking.*

The article analyzes the content, forms and methods of management of innovative activity in modern business environment. Methodical approach to the integration of innovation management into development strategy of enterprise was introduced.

*Keywords:* management, integration, innovation development, investment, management system, development strategy of industrial enterprises, network approach

The need for innovative development of enterprises places new demands on content, organization, forms and methods of management. Current issues and challenges related to the implementation of innovative activity of enterprises mechanical engineering and metalworking, such that is the basis of the real economy require new approaches both in theory and practice of management decisions.

### Analysis of recent research and publications

The development of the innovation process affects the overall development of society both micro and macro level. Innovation is a complex process that involves the creation, development, making available to commercial use and dissemination of new technical or any other solutions (innovations) that meets the specific needs [1]. Innovation in business practices interpreted in the process of converting potential of STP (scientific and technological progress) in the real, embodied in finished products and technologies that innovation becomes a commodity and serves as an object on the market [2]. Development of innovative activity of domestic enterprises is extremely complicated by maladjustment of the former management system of innovations to new market conditions. Therefore, to improve the efficiency of innovation activity, to arrange the system and its organization, enhance validity and analytical decisions, endorse the preparation and optimization of the technology used, the improvement of methods and forms for registration in innovative activity it requires a whole system of innovation management.

Research of innovative issue is given considerable attention by many researchers such as P.M. Zavlin, S.M. Ilyashenko, S.V. Ildemanov, S.D. Ilyenkova, A.Y. Kibanov, O.P. Kovalev, V.G. Medynskiy, A.I. Prigozhin, O. Lapko, F. Yansen, H. Mensh, M.P. Denysenko, V. Hrystianovskiy, Y. Bazhala, V. Heytsya, B. Hrynova, O. Kuzmina, L. Neykovaya.

### Unsolved aspects of the problem

Despite the scientific and practical interest and attention, as well as the diversity of interpretations of research issues of innovation management at the enterprise level, not fully investigated remain issues

related to the integration of a complex system of innovation in shaping the goals and strategies of domestic companies that operate in a competitive market environment.

Yes, there is a need for further study of innovation as a means of solving the problems of enterprises by mechanical engineering and metalworking. Also the value of innovation is underestimated as a tool for profit management of companies, in particular through the use of innovation to produce such an impact on profits which would give an opportunity to support the planned amount of profit levels in the forecast period. In the field of management of innovative activity there is the need to further improve the planning tools of innovation of industrial enterprises and selection of innovation projects.

*The aim* of this study is to develop methodological approach for the integration of management innovation in the strategy of development of modern industrial enterprise.

### **The main material of research**

The basis of the innovation process is the creation and development of new product (technology) - research and innovation process. Thus, innovative activity - is an activity of bringing scientific and technological inventions and developments to result suitable for practical application.

Thus, consideration of innovation in terms of system approach makes it possible to define it as an object of management. By «object in the management of innovation» the industrial enterprise must understand the system of interrelated processes of innovation and elements of enterprise microenvironment combined into a single unit for creation and innovation that would meet the new needs of consumers and businesses and ensure their achievement purposes [3]. Management assumes the process of conscious actions of the subject of management on the object of management in which the state of the second changes and set goals are achieved. On this basis, the process of innovation management involves certain functions related to the organization, planning, motivation, management and control of implementation of innovations. To ensure the efficiency of the process at domestic enterprises there should be set up appropriate systems of implementation of these functions, it is necessary to pay special attention to the formation of an effective mechanism of managing innovative activity both in theory and in practice. Management of innovative activity implies enterprise management, based on its scientific and technological capabilities, focuses innovation on the needs of consumers, analyzes, models situations, based on what conducts management and timely changes in the company, which correspond to the state of the external and internal environment that together allows the company to survive and achieve their goals in the long term.

By «mechanism of innovations management» the study refers to a set of economic, organizational, legal

and other methods and techniques that objectively cause necessity of the use of all forms of economic relations that develop between producers and consumers of innovations over its creation, production and exploitation.

Organization of managing innovative activities as part of an innovative enterprise system provides the possibility of flexible response to changes that occur constantly, can improve the efficiency of scientific development, accelerate their manufacturing and entering the market [3]. There are two areas of effective management of the innovation process.

1) Integration of all stages of the innovation project in a single continuous process, restructuring of all levels of management and coordination of links between them vertically and horizontally. These centripetal tendencies arise from the need to consolidate the resources of the enterprise to perform a specific large scale task.

2) Isolation of management innovation processes in a separate object of management, that is the separation of innovative structures from units that perform traditional functions.

In practice, both approaches are used with a predominance of one of them. At the same time major leading Western companies often conduct reorganization of their research and production complex, which is a reaction of the company to changing market conditions, and represents a realignment of resources to address emerging challenges. Optimization of organizational structure of the company for the innovation process is one of the most important tasks of top management [4].

Management is a complex process aimed at achieving the goals. At the same time problems arise in the implementation of the process of management, also as in determining and taking into account specificity of management object - innovative activity. Thus, one of the challenges of innovation management is the lack of qualified personnel. As practice shows management issues at companies often are addressed not by innovation managers and engineers who tend to be talented, but do not have enough experience in the implementation of innovative activity. In this regard, they are usually willing to answer a question that should come out a result of activity, but only some of them know how to achieve this. This in turn can lead to the failure of even the most promising ideas [5].

Feature of innovation management is to provide quality decision making under conditions of uncertainty and risk. However, successful implementation of this task, in most cases prevents the creation of the necessary organizational structure, which is especially important for large enterprises. In this respect latter should pay attention to the flexibility and adaptability of small companies to the conditions that are constantly changing. In such cases, the efficiency of innovation could be significantly enhanced by the creation of special departments or structural units on a permanent or temporary basis, such as an internal venture. Adapting the

organizational structure of large industrial enterprises to the specific innovation will improve its efficiency and effectiveness.

The process of managing innovation envisages the implementation of certain functions related to the organization, planning, motivation, management and control of implementation of innovations and integration of management system of industrial enterprise development. To ensure the efficiency of the process at domestic enterprises there should be established appropriate systems implementing these functions, it is necessary to pay special attention to the formation of an effective management mechanism of innovative activity, both in theory and in practice [6]. The list of these issues is not exhaustive, but given remarks require priority attention. This solution will help increase their efficiency and effectiveness of innovation processes, which in turn will lead to increased activity of industrial enterprises implementing various innovations.

Gaining importance is organizational side of innovation - building organizational structures focused on innovation. For the development and production of innovations usually special units are created that act like an independent company that is carrying out its own production and market policy as long as the sales and profits are growing dynamically. If growth slows, then reorganizing is carried out: merging with other units or changing its internal structure, including division into smaller independent units. If at once several departments simultaneously are having general scientific and technical difficulties, it is advisable to create a special link to overcome them. In the event of a conflict between the interests of two divisions, so-called "umbrella" group is created that oversees both units simultaneously. If conflicts affecting several departments appear, they are reorganized.

Within the framework of the company by mechanical engineering and metalworking, number of organizational forms of innovative processes that have been proven effective is possible:

- councils, committees, work groups for development of technical policy, preparing assumptions for the company's management on strategic directions of the innovation process;
- departments and central services developing new products that coordinate innovation activities, agree on objectives and directions of technological development, monitor new product development process and its implementation;
- project target groups that perform research and development of new products from concept to production. They are created as independent units and subordinate to senior management of the enterprise. Typically, these groups operate on a temporary basis, although there are regular groups. If successful introduction of innovations, such groups are often the core of the new subsidiaries. As international experience shows, the project

target groups are the main form of organization of the innovation process:

- departments of research and development works - traditional divisions that create new products. Recently their role has grown due to the development and bringing to the stage of implementation of promising new ideas;
- development centers whose mission is to win market position by expanding sales. These units are economically independent. Moreover material encouragement of their staff depends on market success;
- venture structures often act as subsidiaries of large corporations, or as a stand-alone company. They develop and implement scientific and technological ideas associated with increased commercial risk which, if successful, is compensated by substantial profit;
- special innovative funds created from profits to stimulate implementation of innovations. Often these funds act as venture capital funds, fundings of which are invested in venture companies (own or independent), in which companies are interested;
- study groups, including managers, researchers and staff of functional departments. They forecast the development of technology, analyze the subject of research, promising ideas, etc. [7].

A typical trend in the development of innovative activity is for companies to find integration links to each other. This is due to lack of funding, high cost loans, complexity and rising costs of research, reducing the length of the product life cycle, the need for an integrated use of various technologies. Therefore, cooperation between enterprises for innovation is often more effective than its internal organization. Such cooperation is possible within:

- branch institutes created by companies on equal footing;
- innovation centers arising on the basis of association of universities and companies, while small specialized company acts as the head organization;
- financial-industrial groups, holdings and other large associations.

Economical practice shows that size of an enterprise generally does not affect the efficiency of the innovation process. Both large and small companies have specific benefits that occur in a particular situation. The advantages of large enterprises are the following:

- presence of large material, financial and intellectual resources for expensive innovations;
- possibility of multipurpose studies in which efforts of specialists in various fields of expertise are combined;
- possibility of parallel development of several innovations and choosing the best option from several that are being developed;
- lower probability of bankruptcy in case of failure of some innovations.

The role of small enterprises in developing innovations is also great when innovations require significant resources. Advantages of small businesses:

- possibility to switch to the original work, mobility and innovative approaches;
- opportunity to work in areas where large businesses' results seem unpromising, limited or too risky for small-scale income in case of success;
- actual absence of bureaucratic management [8].

The need to search for fundamentally new approaches combined with the requirements of rapid and flexible implementation of the results into production, bringing them to market contribute to unification of advantages of large and small firms: buying licenses by large enterprises to provide loans, purchase of shares or acquisition of companies that have mastered the new product or technology to attract high-tech small businesses as suppliers and subcontractors.

In developed countries various measures of state stimulation of innovative activity are widely used in small and medium business. These include legal, financial, tax, property mechanisms to encourage and support small businesses that specialize in carrying out research and experimental development. Apart from these commonly used features, organizational consulting, and scientific and technical cooperation of large enterprises are the following, universities and research centers with innovative small businesses in order to fast-track the implementation of new developments and their subsequent successful commercialization.

In world practice the following main forms of stimulating innovation in the small business sector exist:

- establishment of special national programs for competitive support of small innovative enterprises working at the state scientific and technical subjects (U.S., Japan, Germany, France, etc.);
- direct funding (grants and loans), which reach 50% of the cost of creating new products and technologies (France, USA, etc.);
- lending, including without interest payments (Sweden);
- grants (in practically all developed countries);
- creation of funds for implementation of innovations including possible risk (England, Germany, France, Switzerland, the Netherlands);
- creation of private investment and venture capital funds to finance innovation projects (in almost all developed countries);
- grants loans, reaching 50% of the cost of introducing innovations (Germany);
- reduction in government fees for individual inventors (Austria, Germany, USA, Japan and other countries);
- postponement of payment of duties or exemption from them if the invention relates to energy savings (Austria);

- provision of a number of benefits and privileges that promote active cooperation of small enterprises, research institutes, universities and large enterprises in the implementation of innovative projects;
- free maintenance of applications of individual inventors, free services of patent attorneys, exemption from customs duties (the Netherlands, Germany and Japan).

Modern trends in economically developed countries made it necessary to adjust the nature of investments, namely direct relationship with innovation. In this regard, we can propose the following classification of investments, which provides expanded reproduction based on the innovative basis (Fig. 1).

Managing innovation and investment process at the micro level should be organized with keeping these basic principles:

- principle of task orientation. Target orientation of investments is limited to scope of solving economic problems of the enterprise, taking into account environmental, social and other factors related to the enterprise actively. System of investment objectives, which is formed by an enterprise, determines sectoral and regional investment priorities and sets some restrictions on participation of the enterprise in the investment process (fig. 2).
- principle of effectiveness. The attractiveness of the project to potential investors in a large degree is determined by the size of the rate of return of capital waiting.
- principle of balanced risks with the maximum possible their minimization. In economic practice usually the degree of risk of investments is directly dependent on the level of their profitability.

In addition, in many countries one of the most important financial instruments of support of innovative enterprises are state contracts from various government agencies to conduct research and development. Such contracts involve careful coordination of all the main characteristics of innovation, expected results, deadlines and necessary expenses. Usually the amount of estimated costs is fixed before works and the final payment is made after their completion. Subsidies and grants are usually provided for supporting radical and risky projects implemented by innovative small businesses that make up the register of companies who have experience performing complex R&D.

The economic well-being of the enterprise largely depends on the quality of management, sound organization of innovation activity: the proportion of inefficient projects is decreasing, the degree of risk is reduced, beneficial impact of the research team is increasing. One of the most effective forms of integration of management system to the innovative activities of enterprise is usage of network approach [9].

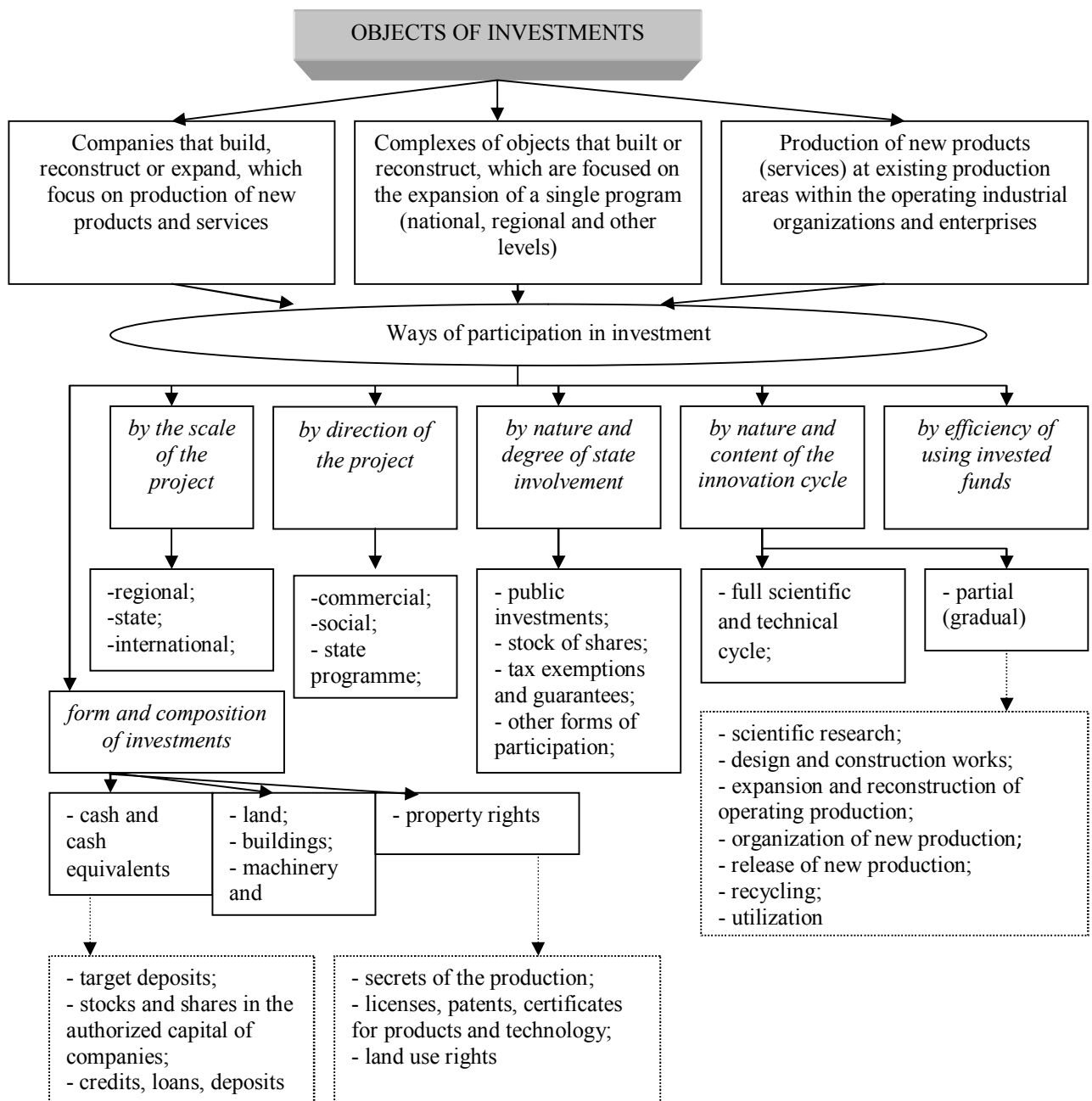


Fig. 1. Classification of objects of investments in innovation in industrial production

Network approach to managing innovation processes in the industrial company solves two interrelated tasks: organization of interaction within the company in designing and manufacturing of innovative product, organization of interaction between market players. Network organization enables interaction between the three main components: market, product and technology that also need to ensure performance, quality, flexibility, adaptability, satisfaction.

Within the concept of network marketing intellectual potential of interacting objects is developing. The development of this potential is possible through: dynamic information exchange;

coordinated innovation; marketing and investment policies; exchange of know-how; shared production facilities and distribution channels.

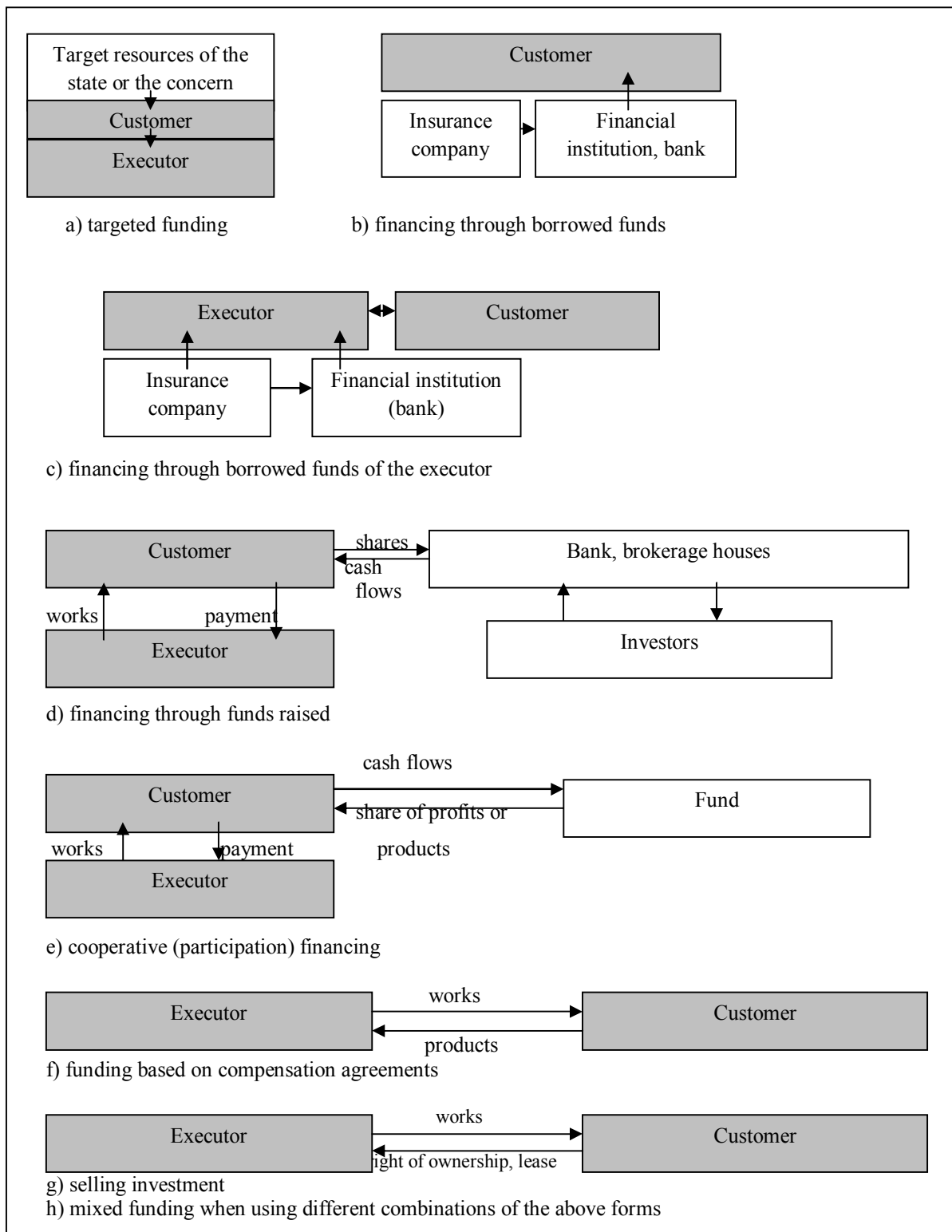


Fig. 2. Forms of financing investment projects

**Conclusions**

The most important success factors of innovation are: consideration of future consumers' requests, existence of close integration links between such activities of the enterprise as research, production and marketing; establishing strong links with external

sources of scientific and technical information and consulting companies; high concentration of high quality scientific and research resources in innovative projects; high status, great experience and length of service of activities; basic research.

Network organization is the main institutional mechanism, created to carry out a systematic process

of innovations. Networks can be regarded as a form of interpenetration of market and organizational structure; represent organizations loosely connected to each other but having a common center, which supports both strong and weak ties with members belonging to this innovative network. The basic

mechanism of communication within information networks – is cooperation. The forms of such cooperation: creation of joint venture companies; signing licensing agreements; signing contracts, subcontracts; joint production; cooperation in the sphere of research and development.

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