

DOI: 10.34680/BENEFICIUM.2021.3(40).5-10

УДК 334.764:339.138:001.895

JEL D25, M31, O25, O32



ORIGINAL PAPER

## MANAGEMENT OF TECHNOLOGY DEVELOPMENT AND FINANCING OF INNOVATIVE PROJECTS IN THE INDUSTRIAL SECTOR OF THE ECONOMY USING MARKETING TOOLS

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**Abstract.** At present, Russian industry is under severe economic and political pressure from the EU and the USA, which is an additional incentive for the development of the industrial complex, based on the fullest possible mobilization of internal reserves (social, economic, innovation-technological, financial). The dynamic development of the industrial complex reflects the general evolutionary trend in the development of society, which necessitates the solution of not only traditional, but also new tasks and problems that were previously not inherent in the economy. The traditional problems of the Russian economy and industry include the lack of its own (internal) financial resources to support production activities, as well as administrative and legislative contradictions. New tasks include the need to improve and create new organizational and economic structures for innovative activities, develop a set of measures and programs to improve the innovation and investment climate, generate demand and commercialize the results of scientific and technical activities. The article substantiates and proposes a conceptual approach to the formation and implementation of innovation marketing in industrial companies, which includes target settings, an innovation management system and the results of the introduction of innovation marketing in the activities of industrial companies. A comparative analysis of various models of financing innovation and investment projects was carried out, which made it possible to highlight the advantages of project financing in the conditions of Russian reality. Thus, it was concluded that the Russian economy should change the vector of development and focus on the maximum use of internal potential by increasing industrial production on an innovative and technological basis, strengthening the investment component of development. To increase the innovative activity of industrial economic entities, it is advisable to use more actively marketing tools and digital technologies.

**Keywords:** industrial sector, innovation and investment processes, innovation marketing, marketing tools, project financing

**For citation:** Veselovsky M.Ya., Pogodina T.V., and Chueva I.I. Management of Technology Development and Financing of Innovative Projects in the Industrial Sector of the Economy Using Marketing Tools // BENEFICIUM. 2021. Vol. 3(40). Pp. 5-10. DOI: 10.34680/BENEFICIUM.2021.3(40).5-10

ОРИГИНАЛЬНАЯ СТАТЬЯ

## УПРАВЛЕНИЕ РАЗВИТИЕМ ТЕХНОЛОГИЙ И ФИНАНСИРОВАНИЕ ИННОВАЦИОННЫХ ПРОЕКТОВ В ПРОМЫШЛЕННОМ СЕКТОРЕ ЭКОНОМИКИ С ИСПОЛЬЗОВАНИЕМ ИНСТРУМЕНТОВ МАРКЕТИНГА

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**Аннотация.** В настоящее время российская промышленность находится под жестким экономическим и политическим давлением со стороны стран-участниц Европейского Союза и США, что является дополнительным стимулом для развития промышленного комплекса, основанного на максимально полной мобилизации внутренних резервов (социальных, экономических, инновационно-технологических, финансовых). Динамичное развитие промышленного комплекса отражает общую эволюционную тенденцию развития общества, что обуславливает необходимость решения не только традиционных, но и новых, ранее неприсущих экономике, задач и проблем. К традиционным проблемам российской экономики и промышленности относится нехватка собственных (внутренних) финансовых ресурсов для поддержания производственной деятельности, а также административные и

законодательные противоречия. К новым задачам можно отнести необходимость совершенствования и создания новых организационно-экономических структур для инновационной деятельности, разработки комплекса мероприятий и программ по улучшению инновационно-инвестиционного климата, формирования спроса и коммерциализации результатов научно-технической деятельности. В статье обоснован и предложен концептуальный подход к формированию и реализации маркетинга инноваций в промышленных компаниях, который включает целевые установки, систему управления инновационной деятельностью и результаты внедрений маркетинга инноваций в деятельность промышленных компаний. Проведен сравнительный анализ различных моделей финансирования инновационно-инвестиционных проектов, который позволил выделить преимущества проектного финансирования в условиях российской действительности. Таким образом, сделан вывод о том, что экономика России должна сменить вектор развития и ориентироваться на максимальное использование внутреннего потенциала посредством наращивания промышленного производства на инновационно-технологической основе, усиления инвестиционной составляющей развития. Для повышения инновационной активности промышленных хозяйствующих субъектов целесообразно более активное использование инструментов маркетинга, цифровых технологий.

**Ключевые слова:** промышленный сектор, инновационно-инвестиционные процессы, маркетинг инноваций, маркетинговые инструменты, финансирование проектов

**Для цитирования:** Veselovsky M.Ya., Pogodina T.V., and Chueva I.I. Management of Technology Development and Financing of Innovative Projects in the Industrial Sector of the Economy Using Marketing Tools // BENEFICIUM. 2021. Vol. 3(40). Pp. 5-10. (На англ.). DOI: 10.34680/BENEFICIUM.2021.3(40).5-10

The technological development of Russia is due not only to the use of digital tools, is associated not only with the development of modern technologies, but also closely correlates with the development of the respective markets. Marketing tools can help ensure synergies between the processes of commensurate development of new technologies and markets. Marketing tools can have an active influence on stimulating consumer demand for innovative products with the subsequent provision of a market balance between the demand for this product and its supply. If we turn to factor analysis, then the quality of the labor force, the volume of production, the level of demand for products and the level of innovative activity have the greatest influence on the dynamics of investments in innovation and investment projects in the manufacturing industry. Hence, economic growth in the country on an innovation basis is impossible without the implementation of the marketing of innovations and the active implementation of its tools. At the same time, not only a clear toolkit is needed, but also an overall approach to the formation and implementation of innovation marketing. In modern domestic science and practice, there is no clear understanding of the target settings of innovation marketing, the management system of innovation and investment processes and their impact on the results of these processes. However, without the introduction of marketing innovations, it is impossible to achieve high indicators in the innovative and technological development of both individual companies and the industrial complex as a whole. At the same time, when assessing the competitiveness of an enterprise, special attention should be paid to studying the characteristics and quality of the goods produced, ways of promoting it to traditional and new markets, which is the basis of the competitive advantages of industrial companies.

The conceptual approach to the formation and implementation of innovation marketing is shown in the Fig. 1. [1].

In the modern conditions of market transformations, digital transformation of business and the life of the population and the increased global competition as a result of these processes, innovation marketing forms new approaches and tools for the implementation of innovative activities based on a developed corporate strategy [2]. Unlike the traditional model of behavior ("production – distribution – exchange – consumption"), marketing carries out the reverse movement, i.e. with identifying and understanding consumer preferences in innovative products and technologies. Then, after conducting a comprehensive analysis of innovation and trends in the innovative development of industrial production, planning the consumer properties of the innovative product and forecasting the volume of its implementation are carried out. Subsequently, a marketing plan for promoting an innovative product is developed. At the end, the monitoring and control of the effectiveness and efficiency of marketing activities is carried out, the marketing plan is adjusted taking into account the identified deviations and the reasons for their occurrence.

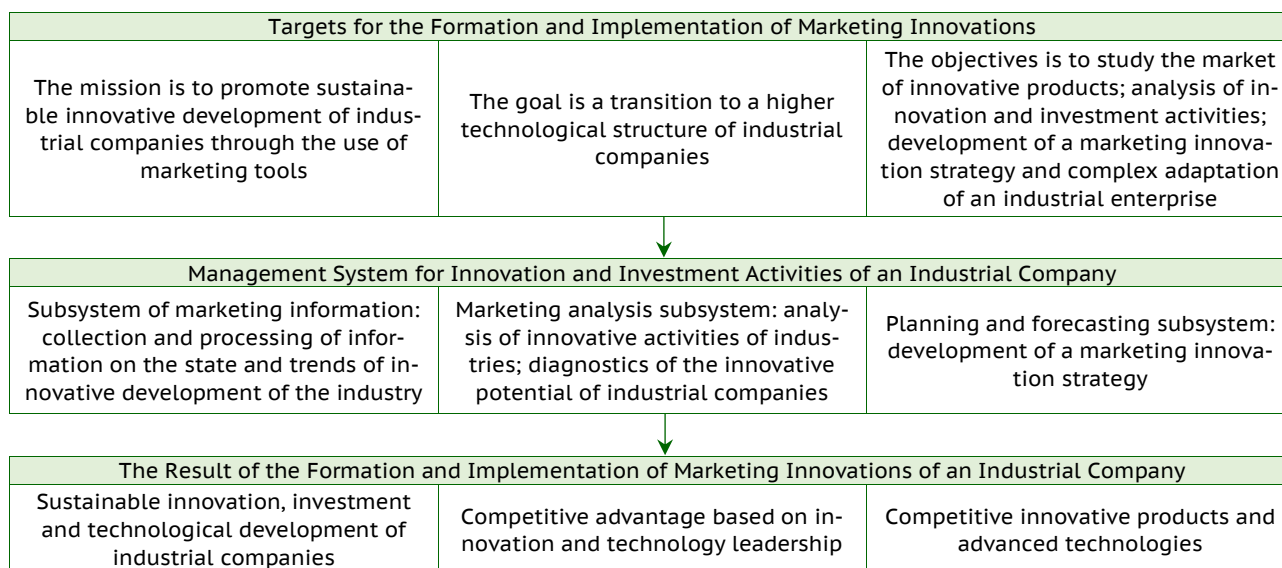
At the same time, it is possible to single out a set of systemic problems that impede the formation and effective implementation of innovation marketing:

- a quarter of top managers in innovation marketing in industrial companies do not have practical skills in its implementation;
- 20% of domestic companies experience a shortage of qualified marketers in the field of innovations with work experience;
- about 10% of companies have no experience in technology commercialization [3, 4].

Thus, the lack of innovation marketing practice in most industrial companies in Russia, one way or another, hinders the possibilities and effectiveness

of its implementation. Therefore, more attention should be paid to the dissemination of best practices, the introduction of a competency-based approach in the activities of marketers, mentoring, the

implementation of training technologies, consulting, internships in the real sector of the economy and other methods of teaching innovation marketing.



**Fig. 1. Conceptual Approach to the Formation and Implementation of Marketing Innovations in Industrial Companies / Рис. 1. Концептуальный подход к формированию и реализации маркетинга инноваций в промышленных компаниях**

Source: compiled by the authors based on [1] / Источник: разработано авторами на основе [1]

An effective complex of innovative marketing should be based on a systematic approach and include a product and product policy, pricing policy and innovative products, identify the most effective sales and promotion channels for innovative products using modern technologies, assess and manage the risks of implementing innovation and investment processes. The role of marketing tools in reducing the production, financial, investment and commercial risks of innovative products is important. For these purposes, one can use well-proven testing methods, including the organization of concept testing, trial marketing and other types of tests that increase the likelihood of a favorable market entry and implementation of innovations.

Currently, there is a lack of understanding in domestic industrial companies of the importance of marketing innovations that can ensure the sustainable development of companies. Lack of financial resources, qualified personnel in this area and lack of experience in practical activities do not allow domestic companies to enter the foreign level. Thus, only 1.5% of domestic companies have the practice of implementing marketing innovations. The level of expenses for marketing an innovative product in domestic companies on average is no more than 10-15% of all costs for innovative activities, which is significantly lower than similar indicators of foreign companies [5].

By giving preference to the implementation of technological and organizational innovations, managers of Russian companies underestimate marketing innovations. Marketing innovations, despite

their high importance, efficiency and effectiveness, are in the last place in terms of distribution. This situation cannot be considered justified and acceptable. It is necessary to radically change the attitude of the heads of domestic industrial companies to innovation marketing and begin its active implementation [6, 7].

Taking into account the current trends in the digital transformation of the economy, the marketing of innovations can be very effective and efficient, since it greatly increases the speed of dissemination of information and bringing it to potential customers. The advantage of digital channels lies in the fact that potential customers are not tied to a specific region, but are distributed all over the world. However, it should be borne in mind that domestic marketing specialists mainly use traditional methods to generate demand and stimulate sales, which is illegal for innovative products and reduces production efficiency. First of all, attention is paid to the consumer properties of innovations, only after that the search for sources of financing is carried out, and last of all, potential sales markets and their capacity are identified. At present, such an approach (direct model) is unacceptable and it is necessary to move in the opposite direction (reverse model), i.e. identify potential customers and sales markets, form channels for the dissemination of innovations, then determine the most significant properties and characteristics of innovative products and only after that look for the most favorable and possible sources of financing for innovation and investment activities.

Thus, when implementing the reverse model,

contradictions between innovative organizations and end users of innovative products are initially removed, which significantly reduces the financial and investment risks of innovative activities. The solution of the inverse model of innovation and investment activity can be more effective and efficient, since it minimizes the number of intermediaries who become participants in the implementation of innovative activities. To implement this task, it is necessary to stimulate the creation and ensure the real functioning of new organizational and economic forms of entrepreneurship – technology

commercialization centers and technological platforms.

The implementation of innovative activities is accompanied by the processes of its financing. However, at present, domestic companies are reluctant to spend on innovative projects for various reasons. But, nevertheless, there is a fairly high variation in the level of costs for innovation. Consider the dynamics of the share of costs for innovative activities in the total volume of goods shipped, work performed, services and other indicators by type of economic activity (*Table 1*).

*Table 1 / Таблица 1*

**Dynamics of the Share of Costs for Innovative Activities in the Total Volume of Goods Shipped, Work Performed, Services in Russia for 2017-2019, percent / Динамика удельного веса затрат на инновационную деятельность в общем объеме отгруженных товаров, выполненных работ, услуг в России за 2017-2019 гг., в процентах**

Indicators / Показатели	2017	2018	2019
Overall for the economy	2.4	2.1	2.1
Extraction of mineral resources	1.5	0.9	0.9
Manufacturing industries, of which	1.9	1.7	1.9
Medium-Tech Industries			
Manufacture of chemicals and chemical products	2.1	2.6	2.4
Metallurgical production	1.2	1.5	2.0
Manufacture of electrical equipment	1.3	1.5	1.4
Production of coke and petroleum products	1.8	1.0	1.4
High-Tech Industries			
Manufacture of computers, electronic and optical products	5.6	5.5	5.7
Production of medicines and materials used for medical purposes	1.5	2.1	2.5

Source: compiled by the authors based on [8] / Источник: разработано авторами по [8]

The success of the implementation of innovation and investment projects is largely determined by the efficiency of the used model of their financing, therefore it is very important to identify an adequate and effective mechanism for financing long-term high-risk projects in high-tech sectors of the economy. As such a mechanism, one can single out project financing, in which the sources of payments and collateral are cash flows, material guarantees to the lender, the economic and technological viability of the project, the company's income and assets [9, 10].

Let us emphasize the priority of the classical mechanism of project financing in the context of the rapidly changing requirements of the modern economy due to its clearer focus on a specific goal. On the other hand, it is limited by a strict time frame for the implementation of an innovative project. In this regard, it is advisable to analyze and research various models of project financing.

A comparative analysis of various multi-instrumental models of financing innovation and investment projects is shown in the *Fig. 2*.

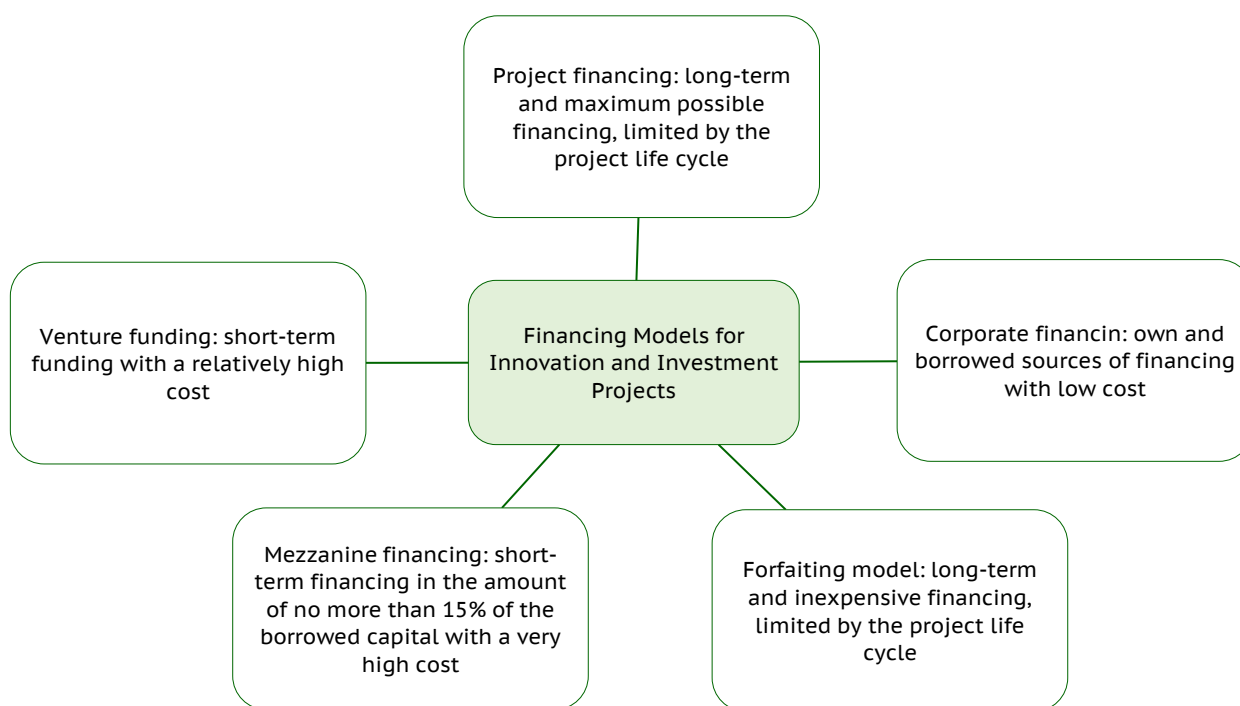
Thus, the systematization of financing models for innovation and investment projects according to the main features made it possible to highlight the advantages of project financing in comparison with other financing models, including its highest level of reliability from the position of financial partners and stakeholders.

The implementation of the project financing model is the most acceptable for modern Russia due

to the presence of a number of aspects, among which the increasing complexity and dynamism of socio-economic, industrial relations and relationships between the main participants under the influence of globalization processes and phenomena can be distinguished.

In addition, project financing is the most transparent in comparison with other models, it allows one to distribute areas of responsibility, required competencies and possible profit sharing. It should also be noted that project financing involves the use of effective methods for managing financial and economic risks, including the distribution and concentration of risks. At the same time, there are poorly studied aspects that require a transition to advanced models of project financing, which consist in the need to take special account of the qualitative characteristics of unique innovative projects, to determine a limited list of key performance indicators for project implementation, taking into account its category and significance. It is advisable to refer to such changes as an increase in information transparency and openness for potential participants in project financing, a more thorough examination and expert assessment of projects.

In addition to project financing, it is advisable to spread the venture financing model as a potential one for the implementation of high-risk projects, which will provide an opportunity to attract a larger number of aggressive investors to innovative activities [12].



**Fig. 2. Comparative Analysis of Various Models of Financing Innovation and Investment Projects / Рис. 2. Сравнительный анализ различных моделей финансирования инновационно-инвестиционных проектов**

Source: compiled by the authors using [11] / Источник: разработано авторами с использованием [11]

Thus, it can be noted that the key areas of structural restructuring of the national industrial complex, increasing its innovative susceptibility, investment activity and technological modernization are:

- introduction of a project financing model as the most acceptable and effective for Russian industrial enterprises;
- the formation and implementation of a client-oriented network model of a sustainable innovation process based on the formation of technological chains by industrial companies, the target of which is to maximize the network added value;
- active implementation and use of innovation marketing tools for the transition to a higher technological order, taking into account the type of innovation and investment strategy implemented industrial company.

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Дата поступления статьи: 5 июня 2021

Принято решение о публикации: 20 сентября 2021

Received: June 5, 2021

Accepted: September 20, 2021