

The Role of Digital Marketing in the Development and Implementation of Innovations in the Electronic Industry

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Abstract—According to the strategy for the development of the Electronic Industry in Russia until 2025, one of the priorities is “the creation of a market-oriented infrastructure”, as well as “the use of the synergistic potential of cooperation of economic entities” [1]. The turbulent, dynamically changing external environment, the complexity of ensuring the relevance of the development time of innovations in the Electronic Industry have led to the emergence of interactive and integrated models for organizing the innovation process. The strengthening of the digital marketing role in these models is not so much associated with the focus on the end consumer, but with the coordination and cooperation of business entities. Modern digital marketing tools help to create networks, consolidate contracts without increasing intra-company costs. Partnerships supported by digital marketing tools provide the highest impact in the development and commercialization of innovative electronic products. The paper describes in detail an integrated model of the innovation process that promotes joint investment, coordinated development of innovations, joint learning and resource exchange, and joint promotion of innovations in the Electronic Industry.

Key words—*technological innovation management; Electronic Industry; digital marketing; innovation promotion; innovation process models*

I. INTRODUCTION

The competitiveness of electronic industry enterprises begins at the level of business entities that are directly involved in the development and implementation of innovations [2]. The innovative activity of business entities within the framework of the innovation process is characterized by natural circumstances that complicate the effective implementation of such a process. These include, first of all, the polysubjective nature of the innovation process and the innovative product development [3]. The presence of several groups of participants in the innovation

process with different goals and needs is not only an advantage, but also the main difficulty of effective development and implementation of innovations. The innovation process, uniting participants from various fields of activity such as science, technology, entrepreneurship, certainly faces the problem of effective coordination of its subjects. The effective introduction of innovative products to the market, the choice of effective strategies for the commercialization of innovations require the selection of optimal methods for coordinating the participants in the innovation process.

II. PROBLEM STATEMENT

Marketing activities are actively used in the development and commercialization of innovations in the Electronic Industry, due to the following factors:

- Reducing the government spending on ineffective areas of investment in innovation. Indicative issue is the use in the State Program of the Russian Federation "Development of Science and Technology" until 2020 of such a target indicator of the subprograms implementation effectiveness as "the share of innovative goods, works, services that are new to the sales market of organizations in the volume of innovative goods, works, services in the field of scientific research and developments".
- An increase in the volume of innovations' financing by the private investors, whose responsibility for the innovative activity results is much higher than that of a state investor, which leads to the active use of marketing methods at various stages of the innovation process.
- The orientation of a number of innovative organizations to highly competitive foreign markets, which requires a thorough approach at all stages of the innovation process,

with the active use of marketing methods (marketing research, marketing communications, and others.) This statement is confirmed by the statistics of technology export from Russia in recent years (Fig. 1).

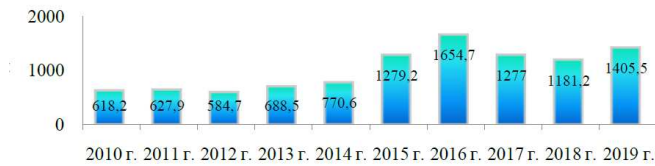
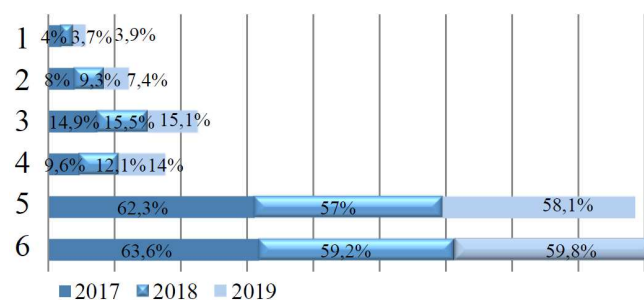


Fig. 1. Dynamics of technology export from Russia in 2010 – 2019, in million dollars [4]

The implementation of the innovation process largely depends on the composition of its participants and, mainly, on the main investor. Figure 2 shows the structure of domestic funding for scientific research in Russia by type of funding source, in% of the total domestic funding.



Sources of funding: 1 - Other sources; 2 - Funds of public sector organizations; 3 - Funds of the business sector organizations; 4 - The own funds of organizations; 5 - Federal budget; 6 - Budgets of all levels

Fig. 2 Changes in the domestic funding structure for scientific research in Russia, 2017 - 2019 [5]

Thus, in the context of both state and private sector orientation on increasing the innovation effectiveness, the use of marketing methods, which essence is to orient all management decisions to the needs of target groups, becomes a critical condition for achieving the competitiveness of the national economy and individual enterprises of the electronic industry. In each of the innovative models used by business entities throughout the evolution of approaches to the innovation process implementation - linear, marketing, interactive, integrated, network - the marketing function always acts as one of its integral parts. Moreover, only the role of this function at each stage of the innovation process implementation changes. In this study, we consider the evolution of the marketing function in the innovation process and its significance in modern conditions. [6].

III. RESEARCH RESULTS

Researchers identify the following models of organizing the innovation process that dominated at any stage of economic development:

Linear - historically considered by researchers to be the first formalized model of the innovation process (Fig. 3)

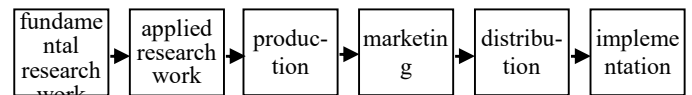


Fig. 3. The role of marketing in the "linear model" of the innovation process

Later, the subjects of the innovation process restructured its organization, focusing on meeting the needs of end consumers, which has led to the active use of the "marketing" model in the innovation process (Fig. 4).

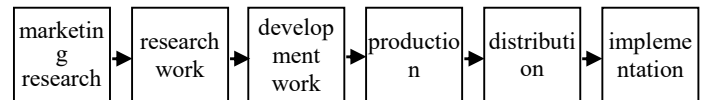


Fig. 4. The role of marketing in the "marketing model" of the innovation process

The dynamically changing external and internal environment, the complexity of ensuring the relevance of the innovation development time and its life cycle have led to the emergence and widespread dissemination of another model - an interactive one (Fig. 5).

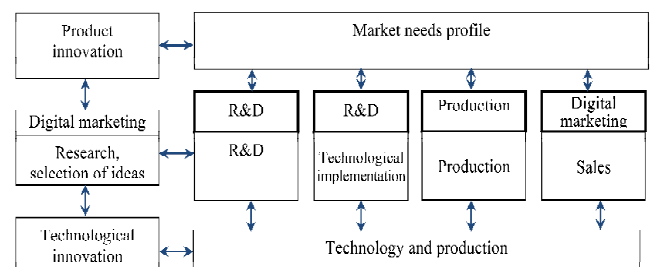


Fig. 5. The role of digital marketing in the "interactive model" of the innovation process

Within the framework of the interactive model of the innovation process, it was supposed to create conditions for permanent transformations of innovative ideas and market needs in accordance with the changed conditions of the external environment. Unlike the previous models of organizing the innovation process, this model implied openness and "interactivity" at each stage. In terms of this study objectives, it can be noted that in this model the first attempts were already made to create methodological foundations and applied tools for active interaction of participants in the innovation process of the development and commercialization of innovations. Thus, the constant monitoring of the external and internal environment with the introduction of changes in certain stages of the innovation process assumed the interaction of its subjects. As a result, the main advantage and qualitative difference of this model from the previous ones is its openness, which presupposes active interaction with the external environment.

The further development of market relations, the increase in the competition level in various markets, the rapid introduction of innovations by different companies and their competitiveness in this process have led to the emergence of a new model - an integrated (Japanese) one. Figure 6 demonstrates the content of the integrated model of the innovation process.

This model is based on the principle of parallel activities of integrated groups using external horizontal and vertical links. Synchronous work on the idea of several groups of specialists

participating in the innovation process allows accelerating the innovation cycle implementation.

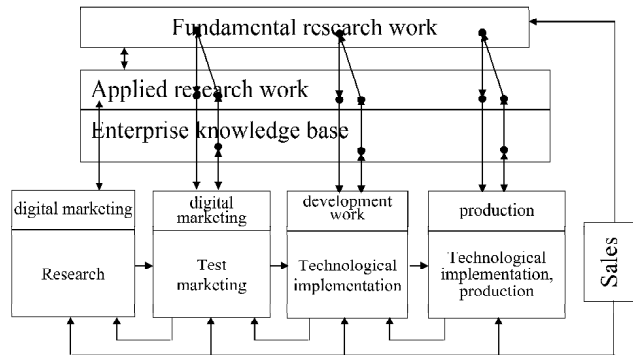


Fig. 6. The role of digital marketing in an integrated model of organizing the innovation process

Since the beginning of the 2000s a number of trends that have made it necessary to spread a new - "network" model of organizing the innovation process are observed. Among such tendencies we can identify the following [7]:

- the desire of the governments to move to a new, VI technological order, when IT are viewed as a tool for integrating ongoing processes;
- the development of communication means and the IT sphere eliminates or minimizes the territorial factor influence (the factor of participants' remoteness in interactions) in the interaction of subjects, which is also typical for innovation processes, allowing economic agents to reach a new level of relationships;
- the participants' interaction in intersectoral and interorganizational associations in modern conditions requires orientation not only to the needs of end users, but also to the mutual needs of the subjects of various forms of interorganizational associations.

Digital marketing covers all stages and all participants in the development and commercialization of innovations, solving various problems in the innovation process (Fig. 7).

The formation of a network of interacting subjects leads to changes in the ideas about the subject of marketing. Such a subject is no longer a separately considered enterprise, but a set of interconnected enterprises that exist in some form, which, as noted above, corresponds to the ideas of relationship marketing. In this context, relationships become an important resource that enterprises own along with financial, material, informational, and other resources.

The relationship between organizations is built along the vertical and horizontal directions. Vertical relationships include relationships in the chain - between suppliers, distributors, manufacturers, and intermediaries in distribution channels. This two-way communication is most often expressed in the form of B2B (business to business). They are built on the basis of partnerships with the main goal for all parties - to benefit from the increased joint efficiency and productivity as a result of the coordinated fulfillment of joint obligations. Horizontal relationships arise between organizations at the same chain

level. Such organizations may include competitors, partners, occupying the same position in the distribution channel, seeking to cooperate to achieve mutual benefit. Vertical and horizontal relationships are not mutually exclusive, that is why the company often maintains and develops bilateral and multilateral relationships of both types, which is also typical for innovative companies.

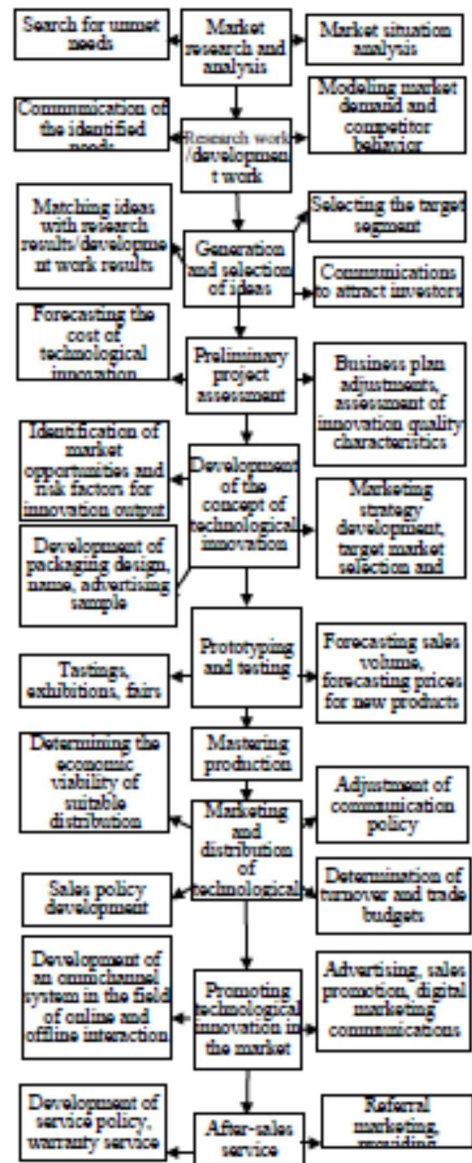


Fig. 7. Digital Marketing challenges in the development and implementation of Electronic Industry innovation

The digital marketing role in the innovation process contains not only the performance of classical marketing functions (marketing research, development and implementation of a marketing strategy, formation and implementation of the marketing mix), but also the coordination of innovation activities of the innovation process subjects due to these functions.

IV. CONCLUSION

Improvement and practical implementation of digital marketing methods, the use of an integrated model for organizing the innovation process in the Electronic Industry allows solving the following problems:

- choose methods and tools for coordinating the participants in marketing interaction in the formation and commercialization of product innovations in the electronic industry;
- to determine the initiators and the composition of the coordinating bodies participants when integrating the participants' efforts in the innovation process;
- to reveal the main approaches and mechanisms of integration and coordination of participants' interaction in the development of innovations in the electronic industry at each separate stage of this process;
- to establish the functional content of the subjects of innovative activity in order to ensure that the participants' functions correspond to the integration tasks;
- to develop a toolkit for assessing the effectiveness of mechanisms for integration and coordination of participants in the innovation process.

Interorganizational integration in the electronics industry through digital marketing offers a number of benefits:

- efficient allocation of resources and obtaining economies of scale;

- increasing the level of competitiveness and competitive advantages of product innovations in the Electronic Industry;
- effective redistribution of financial resources and opportunities for their concentration at the key stages of the innovation process;
- reducing the cost of research and development work;
- reducing the time to enter the market for innovations in the Electronic Industry;
- minimization of risks due to diversification of investment resources;
- obtaining synergistic effects due to the unification of participants in the Electronic Industry.

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