MARKETING TOOLS IN STIMULATING INNOVATIVE ACTIVITY OF ENTERPRISES

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ABSTRACT
The article considers the main aspects of the application of marketing tools to stimulate innovative activity of enterprises. The analysis showed a low level of innovation activity of Ukrainian enterprises. The high importance of Internet marketing is substantiated. The main tools of Internet marketing are considered. The high value of the enterprise marketing system (internal and external) for stimulating innovation activity is shown. The place of marketing service in the organizational system of the enterprise is allocated. The dependence of the innovative activity of the enterprise on the stimulating influence on the creative activity of the personnel is proved. The task of stimulating staff creativity is also entrusted to the marketing department as an element of internal marketing strategy. The principles of value-oriented management and customer orientation are highlighted as the basis for
stimulating staff to creativity. It is proved that the tasks of the external marketing strategy are focused on the formation of the target audience's need for innovative products and services of the enterprise. Therefore, to harmonize the stimulating effect on the innovative activity of the enterprise it is necessary to create an environment of effective and efficient market interaction of all participants, stakeholders and involved in the relationship. A multi-agent simulation model of an active marketing system is proposed, which is able to reproduce the dynamics of interaction of agents with the ability to identify and predict the state of the entire system with marketing tools. Brought, that the objectives of the strategy of external marketing are focused on the formation of the target audience's need for innovative products and services of the enterprise.

**Key words:** marketing, enterprise, innovative activity of the enterprise, Internet marketing


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1. INTRODUCTION

1.1. Relevance of the Topic and Problem Statement

The successful development of the state's economy is directly related to the level of innovation and entry into markets of advanced technologies. The process of generation and implementation of innovations is the basis of successful transformation into a modern knowledge-intensive market economy. One of the key factors that ensure the effectiveness of this process is to stimulate innovation activity of enterprises. In market conditions, marketing is an effective tool for stimulating innovative activity of enterprises. In this sense, marketing is seen not as a separate function of internal management, but as a concept of innovation management of the enterprise, which forms a comprehensive marketing tool to stimulate innovation and increase the competitiveness of the enterprise (Sheremeta et al., 2019).

Innovation is the creation of a new, non-existent that can potentially attract customers (Pitra, 1997). According to the Oslo Guide, innovation is divided into four groups: product innovation, innovation processes, organizational innovation and marketing innovation (OECD, 2005).

It has been proven that marketing innovations have a significant impact on the competitiveness of the brand and the company as a whole (Suraksha, 2016), increase consumer loyalty (Prokopenko, 2011), increase sales and reduce costs (Kamp & Parry, 2017). In the conditions of the industrial revolution "Industry 4.0" marketing innovations are connected with gradual introduction of digital technologies. Businesses that use digital technologies as marketing tools are able to better meet customer needs in terms of product functionality, quality and service life, which has a significant impact on market competitiveness (Wang, 2016).

Marketing innovations are based on lateral thinking, ie the ability to think outside the box, creatively, using the maximum number of approaches to solving the problem, often ignoring the logic. Modern marketing tools include personal marketing, environmental marketing, environmental marketing, guerrilla marketing, high-profile marketing, viral marketing, product placement, mobile marketing, neuromarketing, geomarketing, behavioral marketing, relationship marketing, etc. (Churwiruch, Jhundra-Indra, & Boonlua, 2015; Karyy &
Innovative marketing is related to big data analysis (Mařík, 2016). There are the following main functions of innovative marketing: product or packaging design, product placement or communication channel, product promotion or pricing, market approach, product delivery, service delivery (Chen & Pao, 2017). With the further development of computer and information technologies, there are opportunities for the active manifestation of hidden opportunities for innovative marketing in various previously developed technologies to stimulate innovative activity of enterprises.

In the framework of this study, the following problematic issues are identified:

- identify the main components of marketing tools in stimulating innovation activity of enterprises;
- to develop a model of stimulating the innovative activity of the enterprise, taking into account the latency of marketing innovations to ensure market interaction of all participants in the innovation process.

2. THEORETICAL SECTION

2.1. The essence and Directions of Stimulating Innovative Activity of Enterprises

For enterprises, innovation is the key to competitiveness. Innovation is the result of innovative activity. Innovative activity of industrial enterprises is an indicator of the organization of innovative activities, which reflects the nature of the relationship between the goals and end results of the enterprise. The same goals, strategies, plans, industrial potential for enterprises are not a condition for the same results of their innovative activity. Innovative activity of enterprises explains the different results of innovative activity. Innovative activity of an industrial enterprise represents the relationship between the planned innovation activity and its real results, ie the level of realization of the set goals. Thus, innovation activity is an indicator of the intensity of innovation. The parameters of innovative activity of the enterprise are determined and formed by the research and production, information and technological base, the structure of R & D, organizational structure, management structure and marketing orientation of the enterprise. The criterion of innovative activity of industrial enterprises is the formation and development of innovative products, processes and technologies in the implementation of costs for innovative activities for a specific period of time. In order to carry out innovative activities and produce innovative products, the company must create the appropriate infrastructure, fund R&D and marketing research to promote and sell products on the market. That is, the innovative activity of the enterprise must be market-oriented.

![Figure 1](http://www.iaeme.com/IJM/index.asp)
The key to the innovative activity of industrial enterprises is the innovation environment, which is formed by three main subsystems: 1) implementation of labor and innovation resources, 2) support for the development of innovative ideas and 3) technology infrastructure (Bondarenko, 2019). The level of innovation activity of industrial enterprises of Ukraine is presented in Figure 1.

During the study period (2010-2018) in Ukraine the number of innovation-active enterprises engaged in innovation decreased 1.9 times (from 1462 in 2010 to 777 in 2018). The trend line indicates a decreasing trend in the percentage of innovation-active enterprises in the total number of industrial enterprises, which indicates an unfavorable innovative business climate in Ukraine, which has a detrimental effect on the country's economy and the stimulation of innovation activity.

The share of expenditures on innovation activities of industrial enterprises of Ukraine for 2015 - 2018 is presented in Figure 2.
According to statistics, in the structure of costs of industrial enterprises of Ukraine for innovation, the share of costs for the purchase of machinery, equipment and software is the largest. However, if in 2015 it was 80.6%, in 2017 - 64.7%, and in 2018 - 68.1%. In recent years, there has been a slight increase in enterprises’ spending on research and development and the acquisition of new technologies. However, the innovative development of industrial enterprises of Ukraine is not based on research and development, but on the purchase of foreign equipment and non-technological innovations. This is confirmed by the data presented in Figure 3.

We have a special interest in non-technological innovations in the period 2016-2018. Almost half of the number of innovation-active enterprises (2057 units) are those with only non-technological (marketing and / or organizational) innovations. Fewer (1985 units) with technological (product and / or process) innovations. In recent years, there has been a slight improvement in the structure of innovation of industrial enterprises in terms of technology. However, the total number of innovation-active enterprises still remains very low. If we compare the innovative activity of industrial enterprises of Ukraine with enterprises of other countries, we have a very disappointing picture. A comparative description of the costs of research and development in the GDP of the world and Ukraine is presented in Figure 4.

![Figure 4. Expenditures on research in the world and Ukraine, % to GDP (Eurostat; State Statistics Service of Ukraine)](image)

The dynamics of research spending in the world's leading countries over the past decades has been positive. The most active growth is typical for South Korea - for the period 2000-2017, the share of expenditures has doubled - from 2.18% to 4.55% of GDP. In Ukraine, on the other hand, the opposite trend is observed - the share of research expenditures decreased from 1.16% to 0.45% of GDP. In monetary terms, South Korea in 2017 spent about $ 74 billion on research, Japan - $ 156 billion, China - $ 423 billion, the United States - $ 540 billion (Eurostat), and Ukraine only $ 0.6 billion.

The situation in Ukraine is completely unfavorable for the innovative development of industrial enterprises. The main source of innovative development remains own funds, the share of which amounted to about 90%. Unfortunately, most Ukrainian enterprises remain outside the innovation process. In such conditions it is expedient to search for means and tools of stimulation of innovative activity of the enterprises.
3. METHODOLOGY
The methodological basis of this study is a set of principles, methods of research, general theoretical, special and interdisciplinary research methods based on the synthesis of theories of active systems, innovation, strategic management, marketing. To solve problems and achieve the goal of the study, a system of general scientific and special methods and approaches was used, in particular: generalization, systematization, empirical research, systematic and logical approach - to develop theoretical principles of marketing stimulation of innovative activity of the enterprise; scientific approaches to the identification of targets, which are based on the principles of abstract-logical method, situational analysis; economic and statistical methodological approaches to assessing the potential for interaction of elements of active systems in the course of balancing goals, taking into account the stimulating effect of marketing tools on the innovative activity of the enterprise.

4. ANALYSIS OF RESULTS
4.1. Marketing Orientation as an Element of the System of Strategic Management of Innovative Activity of the Enterprise
To increase the competitiveness of the enterprise it is necessary to take into account a set of radical changes taking place in the modern business environment. The company's management system should be market-oriented, with a focus on management, consumers, competitors, the nature of cross-functional interaction and stakeholders. In the process of forming the market orientation of the enterprise a special role is played by business communications, as an integrated tool for interaction with all participants for the implementation of value-oriented approach (Grönroos, 1994).

The modern consumer determines the customer orientation of the enterprise, which is the basis of its market orientation. To increase consumer loyalty, it is necessary to identify him through the perceived value, to embody this value in the product, to bring it to the attention of the consumer, to enable the consumer to own this value. It is important that value is created with the direct participation of the consumer (Grönroos, 1994). That is, the consumer is involved in the process of creating value using the tools of integrated marketing communications. In modern conditions, the role of the Internet for the implementation of communicative market-oriented goals of the enterprise is increasing.

The use of Internet technologies and digital channels in business to communicate with the target audience has become the basis of digital marketing. The difference between digital marketing and traditional marketing is the use of exclusively digital communication channels, which gives marketers opportunities for control, tools and data to analyze the effectiveness of market position and market-oriented enterprise management. Digital Marketing uses online and offline channels. Digital marketing channels work exclusively on the Internet, and offline marketing channels are connected to digital devices that are not connected to the Internet. This is their key difference.

Internet marketing channels presented in Figure 5.

An online website is the main marketing tool that represents a company's brand, product and services. It is important to develop a strategy and promote your website and content in order to get more traffic and customers.

SEO (Search Engine Optimization) - a set of measures to increase the visibility of the site in search engines, in order to find and attract target customers. To track the results of site promotion and optimization, two key metrics are used - site position by target queries (visibility) and search traffic by commercial queries (additionally calculate CPC - the cost of attracting 1 target visitor per channel).
Figure 5. The main channels of Internet marketing

PPC (Pay per Click) is a cost-per-click advertising model, which is a fee for a specific person who goes to a business website. The most popular PPC platforms are Google Ads and Facebook. The advantage of this format is the focus on results.

Content marketing is a means of building trust, building a reputation and attracting customers through various types of content: text, images, audio and video. The main tools of content marketing: blogs, e-books, online courses, educational videos, infographics, webinars, etc.

Postal Digital Marketing is a means of communication with potential customers. This tool helps you build a database of leads using email lists that can then be turned into funnels for customers.

Social media marketing - marketing in social networks, focused on interaction with the audience of the brand through the corporate page. Marketing campaign in social networks forms brand recognition, public trust, is an important tool of image. It is also possible to gain new customers through social networks or use it as a direct sales channel. The largest social network is Facebook.

Affiliate marketing - earning income by placing affiliate links on your site in any convenient form (embed in an article, place a banner, add a link to the menu, etc.) from each user who clicked on the link and placed an order. Money is accrued as a percentage of the order amount - CPA (Cost Per Action). For example, the Amazon platform has numerous affiliate programs and pays millions of dollars a month to websites that sell their products.

Mobile marketing is the process of finding customers in various mobile app stores, such as Google Play, the Apple App Store, which hosts thousands of apps and their traffic is measured by millions of users a day. With the help of mobile marketing, you can promote your applications, which will increase the number of users and, consequently, customers.

Offline marketing channels are: TV marketing, SMS-marketing, billboard-marketing. However, in the context of total digitalization, Internet marketing tools are the most effective.

Interaction that occurs on the Internet is considered by marketers as a tool for disseminating relevant information to the appropriate target audience, for a limited period of time, with minimal cost.

The possibilities of the Internet are very wide, which allows you to develop not only classic marketing technologies, but also to create new ones. In such conditions, the importance of the consumer increases. This transforms competition, as the potential consumer
has the opportunity to identify competitors in the market, compare their competitive offers and make their choice. The company faced a new task - the development of customer focus, customer focus.

Tools for the formation of customer-oriented is the development of relationships with customers and their maximum involvement, which can also contribute to the Internet. With the help of the Internet there are integration processes aimed at value formation. Therefore, marketing must acquire the qualities of value-oriented. This expands the field of contact with the consumer, accelerates the process of making marketing and management decisions.

In such conditions, the role of internal marketing grows, which forms the tools of communication, influencing the formation of the internal environment of the enterprise and staff loyalty, motivating him to be creative, which in the future can increase the innovative activity of the enterprise.

Internal marketing has the properties of latency, as it is difficult to determine the real capabilities of a marketing tool and its impact on the effectiveness of the enterprise.

For the innovative development of the enterprise requires an appropriate organizational management system. Figure 6 shows the scheme of organization at the enterprise of the stimulating influence on innovation activity.

**Figure 6.** The scheme of the organization at the enterprise of stimulating influence on innovative activity

According to the proposed scheme, the innovative activity of the enterprise is the basis of the innovation strategy, which is formed by the highest level of management of the enterprise. Innovative activity is stimulated by the personnel management service through the development and motivation of staff for creativity. It is creativity that reflects the latency of innovative development, being an intangible potential, the implementation of which can take the company to a qualitatively new level of development. The task of stimulating staff creativity is also entrusted to the marketing department as an element of internal marketing strategy. In this case, the staff of the enterprise is considered as internal customers of the enterprise. The level of their satisfaction contributes to the formation of their loyalty. That is, the principles of value-oriented management and customer orientation are the basis for encouraging staff to be creative. Tasks
To harmonize the stimulating effect on the innovative activity of the enterprise it is necessary to form appropriate marketing tools that would ensure the formation of an environment of effective and efficient market interaction of all participants, stakeholders and parties involved in the relationship.

4.2. Modeling of behavior of participants of market interaction at stimulation of innovative activity of the enterprise by marketing tools

There are several decision-making centers in the system of market interaction. Each participant makes decisions according to their market goals. At the same time hierarchical relations are established. The action of marketing should be aimed at identifying the goals of participants and their coordination. To model the interaction of the participants of such a system, the logical-mathematical apparatus of the theory of hierarchical games is used.

Stimulation by the manager (personnel management center) of creative and innovative activity of the agent is modeled on the basis of hierarchical game:

\[
M_0(x_0, x_1) \rightarrow \max \\
M_1(x_0, x_1) \rightarrow \max
\] (1)

Where \( M_0(x_0, x_1) \) - payment functions (incentives) of the center and the agent, respectively; \( x_0 \) - strategy of the center (a set of management measures to stimulate the agent - staff creativity); \( x_1 \) - agent's strategy (the level of creative activity of staff and their efforts to achieve a certain result in the implementation of an innovative project).

The strategy of the center (enterprise management) includes internal marketing measures to improve the organizational climate for creativity and innovation in the enterprise \( (x_s) \), which significantly affects the creative and innovative activities and the degree of realization of intellectual and creative potential of the agent (enterprise staff) and, accordingly, on the effectiveness of his work. Another component of the center's strategy is the system of agent incentives (staff motivation for creative and innovative activities) \( (x_p) \). The choice of the center \( x_s \) and \( x_p \) is associated with the corresponding costs \( z_s(x_s) \) and \( z_p(x_p) \). The model of stimulating creative and innovative activity of staff is as follows:

\[
M_0(x_s, x_p, x_1, \omega) = u(x_s, x_1, \omega) - z_s(x_s) - z_p(x_p) \rightarrow \max \\
M_1(x_s, x_p, x_1, \varphi) = z_p(x_p) - z(x_s, x_1, \varphi) \rightarrow \max
\] (2)

where \( u(x_s, x_1, \omega) \) - effects from the implementation of the innovation project; \( z(x_s, x_1, \varphi) \) - cost of the agent for the development and implementation of the project; \( \omega, \varphi \) - random variables (perturbation of the innovation project implementation environment: uncontrolled / unaccounted for factors and circumstances). In this case, the variables \( x_s, x_p, x_1 \) are latent and cannot be directly measured.

The dynamics of the behavior of market participants in a complex dynamic system in conditions of uncertainty, risk, fuzzy or incomplete information is unpredictable and difficult to predict. Therefore, to identify and predict behavior of market participants agent-oriented simulation of the interaction of active elements - intellectual agents, for which a situational change in the nature of behavior is possible.

Intelligent agent (Schmidt, 2000) is an active element that simulates human behavior in the process of collecting and processing information depending on the behavior of other participants in the interaction.
To stimulate the innovative activity of the enterprise it is necessary to use marketing tools to influence the choice and behavior of participants.

Thus, a multi-agent simulation model of an active marketing system is formed, which is able to reproduce the dynamics of the interaction of agents with the ability to identify and predict the state of the entire system.

The behavior of the agent is described as some iterative procedure for processing data obtained from marketing research, and is displayed by a sequence of operations in a discrete time period (temporary events).

Dynamics of behavior of participants of the multiagent active system \( (Agents = \{Ag_1, Ag_2, \ldots, Ag_n\}) \) is denoted by the state vector of each agent \( (Ag_i) \):

\[
AgS_i = (B_i, G_i, PL_i, Sn_i, EY_i); i = 1, n
\]

\( \forall i \) \( B_i = \{b_{i1}, b_{i2}, \ldots, b_{in}\} \) – the knowledge base of the i-th agent in a particular field;

\( G_i = \{g_{i1}, g_{i2}, \ldots, g_{in}\} \) – many goals \( g_{ik} \);

\( PL_i = \{pt_{i1}, pt_{i2}, \ldots, pt_{in}\} \) – bank of models (plans) of behavior \( pt_{ik} \) (goals by priority);

\( Sn_i = \{p_{i1}, p_{i2}, \ldots, p_{in}\} \) – structure of intentions (list of behavioral plans that the agent chooses as steps to achieve each goal);

\( EY_i = \{EY_{i1}, EY_{i2}, \ldots, EY_{in}\} \) – identification of external links with agents, in interaction with a specific agent.

Marketing tools become the basis for describing the state and dynamics of the behavior of system elements. This forms a multiagent model of the active system. The mechanism that provides the possibility of managerial influence on such a system is the interaction of organizational components of the upper level, which determine the structure of relationships between the basic components.

The connection between the basic components is provided by marketing tools. Under the condition of functional support of such mechanism, stimulating conditions are created for increase of innovative activity of the enterprise. Marketing tools are integrative, formed from a set of tools for both internal and external marketing.

5. CONCLUSION

The study found that to stimulate innovative activity of enterprises it is advisable to use marketing tools. The analysis showed a low level of innovation activity of Ukrainian enterprises. It is shown that the most successful countries in the world are characterized by a high level of innovation activity. The significance of Internet marketing for stimulating the innovative activity of enterprises and the marketing system of the enterprise (internal and external) is substantiated. Innovative activity is stimulated by the personnel management service through the development and motivation of staff for creativity. The task of stimulating staff creativity is also entrusted to the marketing department as an element of internal marketing strategy. The principles of value-oriented management and customer orientation are the basis for encouraging staff to be creative. Tasks who rely on the strategy of external marketing focused on the formation of the target audience's needs for innovative products and services of the enterprise. It is proved that in order to harmonize the stimulating influence on the innovative activity of the enterprise it is necessary to form an environment of effective and efficient market interaction of all participants, interested and involved in the relations of the parties. A multi-agent simulation model of an active marketing system is proposed, which is able to reproduce the dynamics of agent interaction with the ability to identify and predict the state of the entire system.
Evaluation of the effectiveness of enterprise marketing to ensure the competitiveness of the enterprise - the direction of further research.

REFERENCES


