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Crowdsourcing As An Effective Marketing Communication Technology In Innovative Development Of Enterprises

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Abstract*: The use of marketing communication technologies in the innovative development of enterprises creates appropriate conditions and mechanisms that will stimulate innovative activity and the introduction of its results into the economic practice of enterprises. There are considered in the article the most modern and one of the most optimal technologies for today - the use of existing potential, which is human intelligence. The proposed crowdsourcing technology is based on the use of resources (potential, group intelligence, the principles of self-expression and self-realization of the individual) using information and communication technologies that are suitable for solving important problems of the socio-economic development of enterprises, including innovative ones. A prerequisite for the use of crowdsourcing as a factor in the successful innovation development of enterprises is the spread of modern information technologies and the possibility of their use by participants in innovation processes. Crowdsourcing can become a radical method of producing and commercializing innovation products without significant investments in the conditions of insufficient financial support for innovation processes.

***Keywords*: commercialization, crowdsourcing, global competitiveness index, infocommunication technologies, integrators, marketing communication technologies, marketing mix concept, technology transfer, vendors.**

I. INTRODUCTION

Today, innovations in Ukrainian industry do not give enough impetus to accelerate the country's economic growth. This is confirmed by data from worldwide studies and internal statistics, in particular the value of the indicator - The Global Competitiveness Index (GCI). It includes also the characteristics of the innovation potential, according to which Ukraine is on the 61st line after Pakistan (60), Poland (59) and Lebanon (58) [1]. Ten years ago, on the eve of the financial and economic crisis, we occupied the 52nd position, which gave grounds to consider innovation a competitive advantage of the Ukrainian economy (Table 1).

The current level of the Global Innovation Index of our country testifies to more than modest efforts in the field of innovations and, as a result, low prospects to defeat competitors not only on external, but also on the domestic market. However, on the general background, positive trends are also observed, including an increase in the number of R & D personnel and high-tech campaigns, an increase in the vanguard of system integrators of production control systems from the IT and OT sectors (Operational Technologies, production technologies), as well as Western vendors, branches in Ukraine. In particular, the top ten includes Ukrainian innovators, developers like IT Enterprise, Infocom Ltd, Indasoft-Ukraine, uMuni, Drone.ua, Overvis, SoftElegance, Leantegra, Eleks and Luxoft. In general, companies from 2 categories dominate:

- mature players - IT system integrators - OT, which have been working in the local market for a long time. A striking example of leadership here is Kiev-based IT-Enterprise company, which has more than 200 developers;
- young technology companies - like Leantegra, uMuni and Fractal Tools;
- Eleks, successfully implementing its digital, service platform in the Kernel agricultural holding [3].

For example, Kiev IT-Enterprise demonstrates a number of implementations in Ukraine in technological segments as predictive analytics, predictive services, supply

chain management, MES systems, digital design, and in 2018 VR / AR was also added to this. All this is being introduced here - in Ukraine, for example, at such enterprises as the Kharkiv FED or Interpipe plants. Large global brands - vendors are rather in a waiting position. Many brands explain the reason of their delay in relation to their global sales simply - weak demand and solvency of Ukrainian customers. In this picture there are practically no 2 important categories of innovators typical for developed markets - engineering and engineering campaigns, there are practically no scientific institutes and universities on this map - although in the world it is the most important category in 4.0, if we talk about complex, high-tech innovations where European investments in only one Horizon 2020 program exceed 100 billion euros [3].

Examples of the use of crowdsourcing in Ukraine are announcements by enterprises of tenders for the development of proposals for improving the design of their products or a prize for solving a certain technological problem. The reward in this case is not so much the cash prize as the satisfaction of the possibilities of self-realization.

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Table 1. Dynamics of the Global Innovation Index, Bloomberg (2017-2018) [2]

2018 Rank (place)	2017 Rank (place)	Changing	Economy	General Index	R&D intensity	Manufacturing added-value	Productivity
1	1	0	• S.Korea	89,28	2	2	21
2	2	0	• Sweden	84,7	4	11	5
3	6	3	• Singapore	83,05	15	5	12
4	3	-1	• Germany	82,53	9	4	17
5	4	-1	• Switzerland	82,34	7	7	8
6	7	1	• Japan	81,81	3	6	24
7	5	-2	• Finland	81,46	8	16	10
8	8	0	• Denmark	81,28	6	15	11
9	11	2	• France	80,75	12	35	14
10	10	0	• Israel	80,64	1	27	9
11	9	-2	• The USA	80,42	10	23	6
46	42	-4	• Ukraine	47,28	47	48	50

Based on their goals and available resources, each organization should determine for itself, give one or another part of the work to support their business to the side or carry it out independently. An enterprise gets the opportunity to shift part of the production cycle or any business processes that ensure the economic activity of the enterprise to professionals in a particular field of activity for a reasonable fee.

Since a company specializing in the provision of certain services is the first to encounter problems in this area, it invests in the development of solutions, tasks and the development of appropriate technologies in the continuous training of its staff [4].The formation of Ukraine as a competitive state in the global environment requires qualitative changes and the intensification of scientific and technological development. The current state of innovation development proves that the best indicators of the innovation component of the economy are the presence of scientists and engineers, the quantity and quality, which are gradually decreasing today due to the lack of proper state support for Ukraine in providing favorable conditions for innovation development, lack of incentives and financing of innovations.

Not better things with the penetration of technology. Due to the weak ability to innovate Ukrainian enterprises, advanced technologies are not widely used. For the same reason, foreign direct investment practically does not introduce new technologies into the economy (Table 2).

Table 2. Dynamics of innovative potential and technology penetration indicators of The Global Competitiveness Index (2008-2018) [2]

	Ukraine		Ukraine		France	
	2013-2014		2017-2018		2017-2018	
	rating	assessment	rating	assessment	rating	assessment
Component 9: Technological readiness	94	3,3	81	3,8	21	5,9
9.01 Availability of the latest technologies	106	4,3	107	4,1	19	6
9.02 Introduction of technologies at companies level	100	4,3	84	4,3	30	5,1
9.03 Foreign direct investments and technologies transfer	131	3,6	118	3,5	28	5
Component 12: Innovation	93	3	61	3,37	17	4,9
12.01 Ability to innovate	100	3,2	51	4,3	10	5,5
12.02 Quality of Research Institutions	69	3,6	60	3,9	7	5,8
12.03 Company Costs R&D*	112	2,7	76	3,2	12	5,2
12.04 Collaboration of universities and business in R&D	77	3,4	73	3,4	35	4,2
12.05 State purchases of high-tech products	118	3	96	3	42	3,6
12.06 Availability of scientific and engineering personnel	46	4,5	25	4,7	31	4,6
12.07 Patents for inventions (per million people) *	52	2,9	52	3,6	15	126,6

* R & D - research and development.

To improve the competitiveness and economic growth of the country, a prerequisite is the transformation of knowledge into new technologies and the entry of domestic enterprises into global markets with ready-made technological products.

Among the main reasons for the weak innovation activity of enterprises, experts have identified low demand for innovations (an exception is products, is fundamentally new for the market), shortening the product life cycle hinders timely return on investment in creating new products, the lack of good ideas or opportunities for innovation. Negative factors are also attributed to the lack of skilled workers within enterprises. The results of the State Statistics Committee's research on the innovation activities of industrial enterprises according to the European CIS methodology explain the position of the World Economic Forum in relation to Ukraine. The share of non-innovative enterprises in Ukraine is about 80% during last 10 years. Due to the lack of government support, mostly large enterprises can afford the luxury of innovation, and at their own expense. High costs, lack of financial resources, and the lack of affordable loans are the key obstacles to innovation in industry, and explains the low cost of R & D companies in the GCI of Ukraine. In the total amount of innovative expenses, almost 70% is spent to the purchase of machinery, equipment and software, 15% to carry out internal R & D and only 9.1% to finance external research. Thus, the low capacity for innovation in the GCI of Ukraine is due to the fact that enterprises master new technologies mainly by importing investment goods, rather than putting efforts to create (improve) new products and processes [2]. In the national report "Innovative Ukraine 2020", the authors noted that the human person is the main innovator and the basic resource of the innovative development of society. Innovative institutions and the state are called upon to create conditions for effective innovation activity and the realization of its results. The market, on the other hand, ensures social selection and commercialization of innovations, turning them into a factor of socio-economic development [5].

In order for Ukrainian enterprises to reach a qualitatively new stage of innovative development, it is extremely necessary to search for and to implement effective ways for stimulating innovative activity of domestic enterprises in the direction of creating innovative products and in the direction of their commercialization.

In this article, the author proposes to analyze non-traditional and financially accessible ways of solving the problem, which will allow more efficient use of existing scientific potential and increase the country's competitiveness in the absence of state support, revenue decline and increase in expenses of enterprises.

Analysis of recent research and publications leads to the conclusion that outside the field of view of scientists there remain issues of innovative development based on modern marketing communications technologies, in particular, crowdsourcing, which is a source of more efficient use of the potential of enterprises based on knowledge.

A. The formulation of the objectives of the article

The main purpose of this article is to justify the need to use crowdsourcing (English "crowdsourcing", from the crowd – a large number of people gathered together and sourcing – the use of resources) – to involve a wide range of people in solving innovative problems of innovative production activities in order to use their creative abilities, knowledge and experience. work on a voluntary basis using of information and communication technologies, as an effective technology of marketing communications in ensuring innovative development and increasing competitiveness ability of domestic enterprises. As well as an understanding of the main advantages of crowdsourcing for enterprises that carry out or plan to carry out innovative activities in the context of limited financial and intellectual resources.

II. THEORY

The conditions of global competition set the task before the manufacturer to achieve world standards for product quality. Innovations are newly (applied) and (or) improved competitive technologies, products or services, as well as organizational and technical solutions of a production, administrative, commercial or other nature, significantly improving the structure and quality of production and (or) the social sphere [6].

According to the Organization for Economic Cooperation and Development (OECD) and the Oslo Management for the definition of "innovation", there are such types of them:

- innovation in the commodity sphere: a new or improved product, or service in the context of specifications, components, materials, software support;
- innovation in the marketing sphere: includes a new method of product sales;
- organizational innovation - new organizational methods in the business practice of a company, creating of new working places or external relations.

Increased competition in the markets and the associated need for product introduction, has competitive advantages, gives rise to the emergence of new ideas, which, in turn, expands the system of species classification of innovations. Subjects of innovation activity can act as consumers of lower level innovations and suppliers of higher level innovations. In any case, the commercial proposal will contain one of the following options: a fundamentally new idea of an innovative solution, a modified innovation, an innovation of mass consumption or a substantially improved product [7]. Therefore, the implementation of innovative solutions and meeting the needs of consumers in innovative products, contribute to their effective development and belong to the field of marketing innovation. In a general sense, innovation marketing is a marketing activity to promote products or technologies that have completely new properties.

The concept of innovative marketing fits into the classical theory of marketing, however, it has its own characteristics, which are manifested primarily in the "4P" complex or the marketing mix concept - one of the most well-known and popular marketing concepts. This idea appeared in 1964, when Neil Borden published his article "The marketing mix concept," in which he tried to combine all the elements that need to be taken into account when drawing up the company's marketing plan.

Initially, such a plan contained a much larger number of items, but Neil managed to reduce their number to 4 and make them easier to memorize. This is how the 4P complex has been appeared. The complex marketing mix combines the factors that can be influenced by the marketer. A strategy, developed on the basis of the 4P concept, should increase the perceived value of the proposed product: product or service [8].

From the point of view of innovative marketing, the product policy of enterprises involves the identification of promising innovative products, services, ideas that can be

supplied to foreign and domestic markets, as well as the determination of the volumes and conditions for their implementation.

Pricing marketing strategy involves the development of principles for planning the price characteristics of proposed innovations for the market, included in the product strategy. It should promote the positioning of the enterprise as an innovation-oriented to achieve the desired market position.

The marketing marketing strategy determines the opportunities for wholesale and retail trade, the need for services, the integration of marketing activities, the types of intermediaries and their role in the distribution chain, the optimal structure of methods and distribution channels from the standpoint of convenience to consumers.

Promotion of innovation is carried out vertically or horizontally. According to the first option, the innovation cycle is concentrated in one organization with the transfer of the results achieved at individual stages of innovation activity from unit to unit. Horizontal promotion of innovation is carried out on the principles of partnership and cooperation, according to which the leading enterprise is the organizer of innovation, and the functions of creating and promoting innovative products are distributed among the participants. A necessary component of horizontal promotion of innovation in an enterprise is technology transfer – the movement of technology using any information channels from one of its private or collective media to another. The organization's commercial activities are supported with the help of the transfer [9]. The promotion strategy consists of a set of actions aimed at the formation and transfer of positive information about innovations to create a favorable image of the enterprise. This is achieved, first of all, by means of marketing communications.

The use of modern communication technologies allows us to expand the boundaries of opportunities for obtaining information on the formation and implementation of commercial proposals, taking into account each potential consumer. At the same time, the interaction tool is a set of interactive communications tools, the use of which allows to make an effective impact on the target audience.

It should be noted that the innovation cycle includes four stages: fundamental scientific research, applied scientific research, that is, the production of scientific products, the production of new high-tech products, implementation (innovation).

III. RESULT AND DISCUSSION

The object of exchange in the field of innovation can be the results of any stage of the implementation of the innovation process. The most effective examples of the latest tools and means of marketing communications in the enterprise in the process of promoting innovation to the market can be attributed (Table 3) [10].

Innovation marketing makes it possible to use non-standard methods at any stage of the innovation process. One of these methods, which is widely spread due to the development of Internet technologies, is the method of attracting consumers to create a new type of product, namely crowdsourcing.

According to the [11] crowdsourcing is a customer-oriented approach to management, when a company focuses on the production of goods and services to the consumer and gives him the opportunity to make decisions. Crowdsourcing is considered today as an instrument of marketing communications aimed at the development of regions, innovative subsystems, which ensures the search and further application of creative solutions that come from the competition of project proposals from the regional community. The use of crowdsourcing technology in management is interested for citizens and attracts them to work improving the quality of life [12].

Depending on the types and level of development of marketing communications, innovative culture it is possible to aggregate information, ideas, suggestions, opinions, experience, forecasts, priorities, evaluations with the help of crowdsourcing.

The use of crowdsourcing as a way for attracting the collective mind of different individuals to solve the problem of creating a new type of product is primarily connected with the ineffectiveness of the model of "closed" innovations (creating innovations on their own), the use of which in modern conditions has a significant impact on the financial sphere of enterprises. A transition to "open" innovations will allow to use external ideas and knowledge along with internal sources of innovation [13].

Crowdsourcing technology, built on the principles of "open" innovation, is based on the understanding that attracting the ideas of the "crowd" often leads to innovative solutions. In addition, communications in "open" innovations provide bilateral streams of knowledge, information, ideas and innovations. The process of "open" innovation can be carried out in five basic forms: obtaining knowledge from the outside, transferring knowledge, partnership, ventures, innovations initiated by users [14].

Using crowdsourcing in marketing, many companies have already evaluated innovations for themselves on the users, that is, the manufacturer is guided by the opinion of people not only when developing needs, but also in product development and improvement [15].

Table 3. Examples of the tools and means of marketing communications

Marketing communications tools	Characteristic
Trend setting	This is the process of anticipating changes in consumer tastes in the future, which allows enterprises to make forecasts, to plan and to make the necessary changes in connection with the marketing strategies of any sphere of production and services.
Buzz marketing	It is characterized as the management of a reaction to a certain (advertising) event using the methods of psychological influence of "infection", imitation, and fashion. It is also the generation of rumors, the resonance of public opinion after the event and provides for the creation of a stir, the hype around the product.
WOM technology	This is the technology of "viral" dissemination of information due to the effect of "word of mouth". Becoming witnesses of any strange events, people tell about them to friends, relatives, acquaintances; photos and videos are spontaneously distributed on the Internet.
Event marketing	It is aimed at organizing special events, providing the consumer with a personal positive experience in communicating with the brand, and thus forming an emotional connection with it. Often, it is not the fact of participation that is important, but the information wave about the event and the user feeling their involvement in the process.
Product placement	This is a promotional technique, which consists in the fact that props in movies, TV shows, computer games, music videos or books has a real commercial equivalent. Usually the advertised product itself, its logo, or its high quality is mentioned.
Flash mob	This is a pre-planned mass action, usually organized via the Internet or other modern means of communication, in which a large number of people gather quickly in a public place, performs pre-agreed actions within a few minutes (according to a specified scenario).
Provocative Marketing (PM)	Based on the absolute novelty of each project. It does not provide ready-made solutions, but works in secret, affects the subconscious, intrigues and engages in an emotional game, calls on the consumer to search independently for the encrypted meaning of the advertising message. PM provokes the creation of conflicting opinions, generates a wave of rumors. Does not have a standard mechanic, more economical than advertising.
Entertainment Marketing	It consists in using the techniques of the entertainment industry to promote products and services. It is important to create a positive atmosphere that will be associated with a specific enterprise, and make marketing communications vivid and playful.
Life-placement	This is a combination of theatrical productions and marketing promotion, where life itself is the scene. The actors are specially prepared promoters, the requisite is a product or service, the script is a pre-designed campaign plan, and the viewers are we ourselves.
Teaser	This advertising message, built as a riddle, which includes some information about the product, but the product itself is not shown. Teasers usually appear at an early stage of product promotion and serve to create intrigue around it.
Ambient media	These are outdoor advertising media created using the environment in which the target audience is located. Today is the standard term in the advertising industry and defines non-traditional or alternative media.

There are "ordinary" and "intellectual" crowdsourcing. The latter is a combination (synergy) of the intellectual levels of the participants. Unlike the usual one, in which decisions and ideas are taken individually, the collective mind, which is formed by integrating individual consciousnesses through a network of electronic communications, allows to achieve synergy, that is, improves performance with an increase in the number of participants.

Crowdsourcing generates ideas and creative solutions using digital information. The level of intellectual potential of the performers themselves is of great importance. The generation of new ideas takes place with the active involvement of knowledge from the external environment, through the development of cooperation with other organizations, researchers and universities. The results of their own research, if they do not correspond to the goals of the business, are transferred to other participants in the innovation process who are interested in these studies [16].

Crowdsourcing technologies should be used both in the process of creation and promotion (commercialization) of innovative products, using the ideas of collective intelligence at each stage of bringing it to the consumer (Fig. 1).

The scheme, that is proposed by the author, for the process of creating and promoting (commercializing) innovative products through crowdsourcing demonstrates the general technology of applying the potential of collective intelligence to solve issues of innovative development of enterprises and organizations.

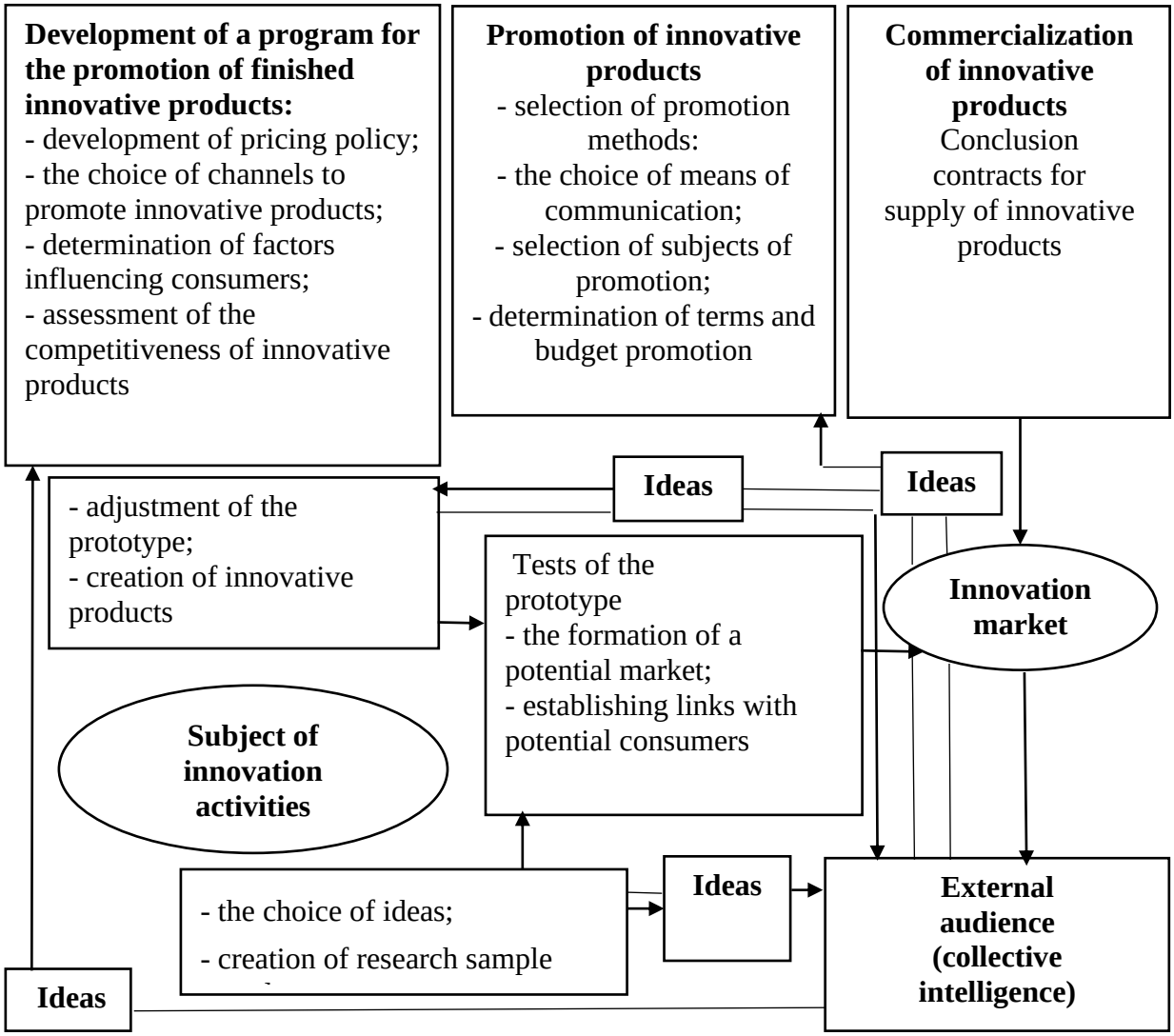

Fig. 1. Creation and promotion (commercialization) of innovative products through crowdsourcing.

The advantages of this approach are obvious, and manifest, above all, in reducing the time of the development stage, which will speed up capital turnover and ensure the competitiveness and relevance of innovative products; in saving financial resources and the possibility of a more flexible distribution of funds for the development, implementation and commercialization of innovations; in expanding intellectual potential by attracting more ideas in comparison with available resources.

In addition, the use of crowdsourcing by innovatively active enterprises provides a number of additional features:

- using advantages of direct marketing by creating electronic databases of participants and customers;
- the possibility of implementing the ideas of small enterprises, through cooperation with large companies.
- attracting partners and customers to the process of innovation development, if before customers had seen only the finished product, now they can be involved in the creation of new products;
- taking advantages of social networking platforms to differentiate the market better and to attract fresh ideas;
- the possibility of realizing of its interests under the conditions of the “triple helix” (interconnection of science, business and power) et cetera.

IV. CONCLUSION

The need to modernize and to upgrade production, the creation of new innovative solutions that can improve the competitiveness of domestic enterprises, is a very acute and at the same time difficult for many of them problem. The use of marketing communication technologies in the innovative development of enterprises creates appropriate conditions and mechanisms that will stimulate innovation, and the introduction of its results into the business practices of enterprises. The article has been considered one of the most up-to-date and, in our opinion, one of the most acceptable in today's conditions technologies of using the existing potential, which is human intelligence. A prerequisite for the use of crowdsourcing as a factor in the successful innovation development of enterprises is the spread of modern information technologies and the possibility of their use by participants in innovation processes. Crowdsourcing, as it has been justified, allows for more efficient production and commercialization of innovations, which is acceptable both at the enterprise level and at the level of the region and the country as a whole.

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