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## **USING THE INNOVATIVE RESEARCH CENTER FOR INTRODUCTION OF RESOURCE-SAVING AND ENVIRONMENTALLY ORIENTED PROJECTS BASED ON THE CROWDSOURCING PLATFORM**

**Abstract.** The article reveals the essence, problematics and classification of trends of crowdsourcing in the context of the environmentally-friendly sphere; advantages and disadvantages of crowdsourcing as a tool; the feasibility of the crowdsourcing platform use in implementing resource-saving and ecologically oriented projects on the basis of the innovation and research center.

**Key words:** resource-saving and ecologically oriented project, crowdsourcing, innovation and research center.

**Problem setting.** Nowadays, modern economy involves areas such as areas of development as: globalization, informatization and greening, and on this basis there should also be changed the approaches to industrial enterprise management. Reorientation of the economy to address typical technical and technological issues towards new innovative knowledge and its use in industrial production has been actively developing in recent years. In this context, the ideology of implementing the crowdsourcing philosophy in the resource and environmental scope becomes particular relevant. One of the ways to address large-scale and multi-component tasks is application of the crowdsourcing platform; this issue arises particularly acute in the field of efficient environmental management, use of secondary resources and wastes, implementation of resource-saving projects in industrial production. At present, in Ukraine crowdsourcing is used only in rare cases and it can be stated that the active use of its facilities will help to effectively solve many diverse tasks, including the ones in the environmental field.

**Analysis of recent research and publications.** At present, with the aim of studying various aspects of crowdsourcing and determine the scope and cost-effectiveness of its application, there was published a large number of works both by foreign and domestic scholars. However, it should be noted that the application of crowdsourcing and the crowdsourcing platform as a model for solving the problems and tasks in the field of environmental management and implementation of resource-saving and ecological projects is paid insufficient attention.

**The purpose of the article** is to address the issues of substance and crowdsourcing in the context of environmental sector and identifying opportunities to use the crowdsourcing platform in implementing the resource-saving and ecological projects on the basis of the innovation and research center.

**Statement of the main research material.** The intensification of globalization processes in economic systems led to the negative effects in the field of environmental protection, for example, large-scale industrialization has increased the burden on the environment not only nationally but also internationally. Therefore, joint efforts to reduce environmental threats and prevent the consequences of the negative impact of production on the environment will have positive consequences for the entire global community. But at the national level, domestic enterprises show little interest in implementing ecologically oriented investments, it can be to some extent be explained by the lack of funds for implementing such activities, as well as by a very low informatization level as for perspectives and the benefits from implementing resource-saving and ecologically-oriented projects.

It is possible to estimate the scale, the dynamics of the system of ecologically-oriented investment with the help of some statistical indicators. Thus, in 2012 enterprises, institutions and organizations sold 20,514.0 millions of UAH of environmental investments, which compared with the previous year is above 11%<sup>1</sup>. This suggests that the interest in resource-saving and ecologically-oriented projects despite the sharp contemporary issues of energy saving and environmental protection is growing. So, there arises the question that does not lie in simple innovation as the moving force of economic development on the one hand, and ensuring energy and ecological security on the other, but also studying the use of crowdsourcing techniques in environmental protection from the perspective of marketing and the market of resource-saving and ecologically-oriented innovative projects.

Also, it should be noted that in the context of financing environmental spending, there prevail private financial resources of businesses, at the expense of which there was made 59.1% of capital investments and financed 96.6% of current expenditures, whereas at the expenses of the budgets of different levels there were spent only 7% of capital investment and about 3% of current expenditures<sup>2</sup>.

In this analysis, you first need to stop considering the nature and the content of the concept of “ecologically-oriented investments”, “resource-saving project”, and “crowdsourcing”. It is expedient to refer to ecologically-oriented investments all types of property and intellectual values participating in economic activities, aimed at reducing and eliminating the negative impact on the environment; storage, improvement and rational use of natural resources of areas; provision of environmental safety of the country, resulting in the achievement of environmental, social and economic results<sup>3</sup>. A resource-saving project is defined as a set of activities aimed at solving resource-saving problems with maximization of the environmental effect, the implementation of which is limited in time and consumption of material, financial, labor and natural resources<sup>4</sup>.

In English the *crowdsourcing* appeals to a mass source. The term in the broadest items appeared relatively recently. In 2006, chief editor of “Wired” Jeff Howe formulated the given term<sup>5</sup> in the article “The Rise of Crowdsourcing”.

Author also proposes<sup>6</sup> the following definition: crowdsourcing is involvement in solution of the problem of thought of a huge number of different people, and further this idea is analyzed, and the most significant one is selected on the basis of decision-making.

The commonplace use of crowdsourcing techniques is their application in sociological research (e.g. exit-poll data, expression of opinion of city dwellers concerning cultural monuments or reforms, etc.), in market research or advertising. This method allows manufacturers to establish a backward and one can say a constant contact with their customers, since the application of possibilities of the Internet and social networks (Facebook, Twitter, Vkontakte and others.) makes it possible for many companies not only consider the needs of different categories of consumers but promptly modify their strategy.

As A. Pankrukhin puts it, in line with modern trends to better penetration into the essence of marketing management, crowdsourcing is the transfer of certain functions to create consumer values, and then, in this regard, other marketing functions to a certain number of people among actual and potential customers based on the public offer on the part of the manufacturer<sup>7</sup>. Applying this definition to the environmental sphere, we can say that all customers are real, because all the people in any way use natural resources and the material welfare.

Therefore, given the above, in the field of environmental protection crowdsourcing should be seen as mobilizing resource of many people through the use of new information technologies to address pressing

<sup>1</sup> Доповідь Державного комітету статистики «Довкілля України у 2012 році» <[http://www.ukrstat.org/uk/operativ/operativ2012/ns\\_rik/analit/arhiv.htm](http://www.ukrstat.org/uk/operativ/operativ2012/ns_rik/analit/arhiv.htm)>.

<sup>2</sup> Тихоненко В.С. Екологічні інвестиції в Україні: теоретично-прикладний аспект <<http://vestnikdnu.com.ua/archive/201374/47-52.htm>>.

<sup>3</sup> Андреева, Н.Н., Харичков, С.К. (2000) Экологоориентированные инвестиции в системе обеспечения ресурсно-экологической безопасности. Одесса: Институт проблем рынка и экономико-экологических исследований НАН Украины, 196.

<sup>4</sup> Андреева, Н.М., Барун, М.В. (2012) Науково-методичний підхід до діагностики та ранжування ресурсозберігаючих проектів: соціо-еколого-економічний аспект. Економічні науки. Серія “Економіка та менеджмент”: Збірник наукових праць. - Луцький національний технічний університет, 9 (34), 10-24.

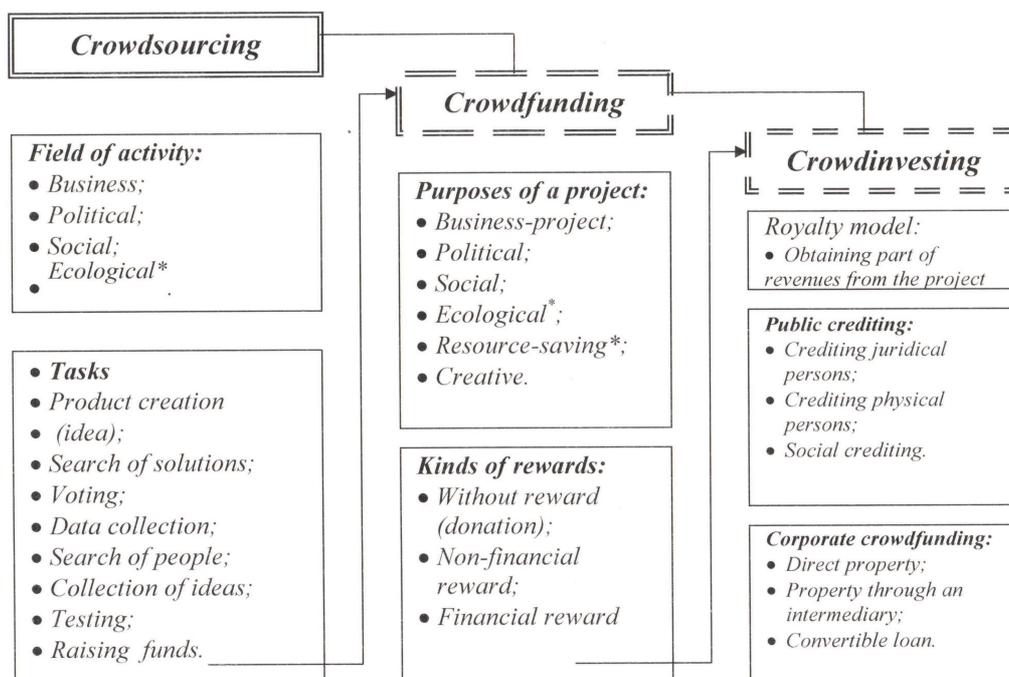
<sup>5</sup> Howe, J. (2006) The Rise of Crowdsourcing. *Wired*, 14(6), 176-183.

<sup>6</sup> Лапшова, О.А. (2012) Краутсорсинг бизнес-процессов – одна из стратегий современной концепции маркетинга. *Проблемы экономики и менеджмента*, 4(8), 53-56.

<sup>7</sup> Панкрухин, А.П. (2011) Краутсорсинг – соблазнительный маркетинговый агрессор: принципы, содержание, технологи. *Практический маркетинг*, 1(167), 3-10.

issues on the improvement of the environment and preservation of natural resources at the enterprise level, region and society as a whole.

Classification of areas of crowdsourcing according to the field of application (business, social and political crowdsourcing) and the types of problems that are solved (creating a product, search of solution, voting, information gathering, people search, collection of ideas, testing, fundraising) are presented in the Pankrukhin's work<sup>8</sup>. But according to the authors, and in the context of environmental management, there is another field of application - environmental. Also, in a separate case, when introducing resource projects there should be considered such a notion as crowdfunding, that is to attract the support of a great number of people, organizations, individuals and legal entities to accumulate financial resources for project implementation (Fig. 1).



**Fig. 1. Classification of crowdsourcing trends**  
(\* - supplemented by the authors)

Two categories of crowdsourcing are identified there<sup>9</sup>:

I category – public sector projects, in this case the desire of people to help their country and others acts as a motivation;

II category – conversion of collective intelligence product into commercial gain. A team of thousand or even million people can fulfill one can create a significant product within a minimum period of time.

We believe that resource-saving and ecologically-oriented projects combine both of these categories, as often the effects of implementing this type of projects are of primarily ecological character of different scales (from local to international), and only secondly a commercial result. That is why implementation of crowdsourcing in this area is a market adaptation of innovation projects practical activity in the environmental field.

Like any tool crowdsourcing has the following advantages:

- large volume of coverage (area, community, etc.);
- possibility of additional profits (using remote workforce);
- distribution of risks.

And disadvantages:

- uncertainty of ownership for intellectual development;

<sup>8</sup> Минц, А.Ю. (2013) Краудсорсинг, как метод решения задач в глобализованной экономике и особенности его использования в Украине. *Вісник приазовського державного технічного університету. Серія: Економічні науки*, 26, 85-90.

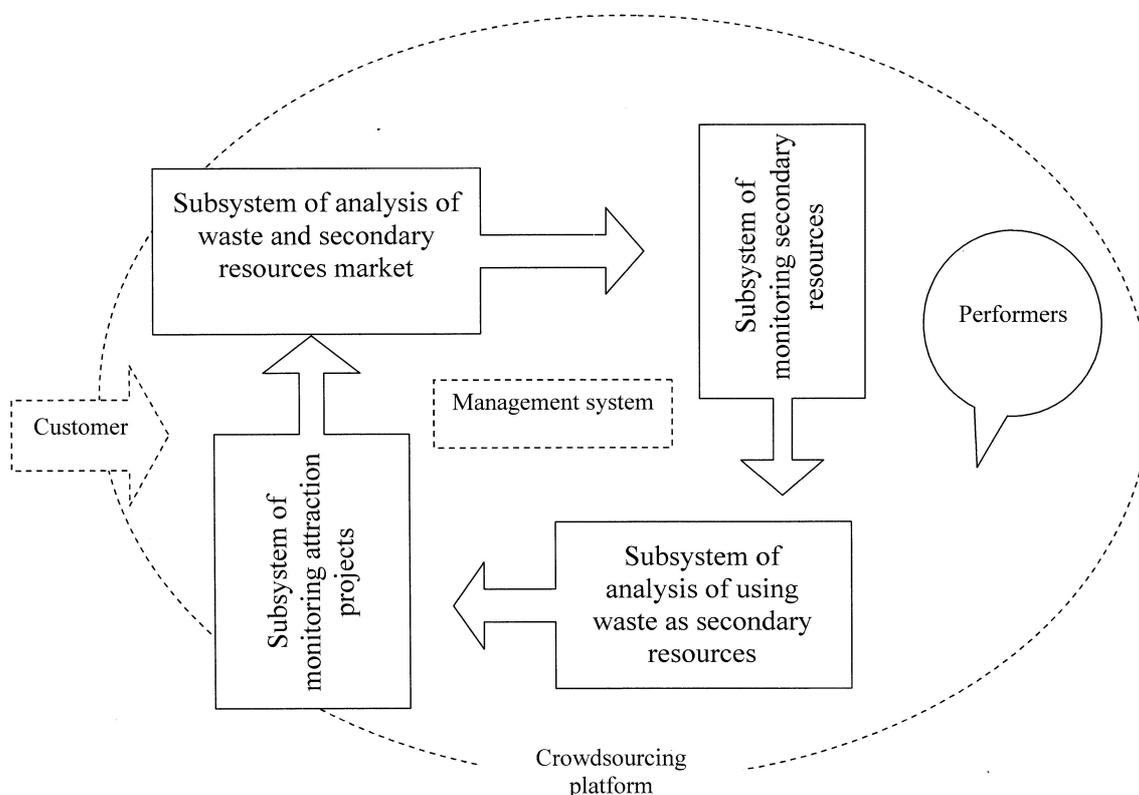
<sup>9</sup> Панкрухин, А.П. (2011) Краудсорсинг – соблазнительный маркетинговый агрессор: принципы, содержание, технологии. *Практический маркетинг*, 1(167), 3-10.

- complexity of quality management of the intellectual product;
- difficulty of the motivational component.

Under environmental crowdsourcing one should understand the involvement of ideas of many different people to change the psychology of executive decision-making with the aim of implementing the environmental factor in enterprise business activities. Implementation of the environmental crowdsourcing occurs in two areas, namely: first – to determine the market value of the resource-saving or ecologically-oriented project; secondly – to determine the social and environmental responsibility. The circle of respondents participating in this process should look like a synthesis of experts in the field of resource-saving and on the other hand like marketing experts, it is this combination that would enable to solve major problems of the environmental crowdsourcing.

The mechanism of implementation of a larger number of projects that fit the definition of crowdsourcing is closely related to the concept of “platform” – a virtual meeting place for the customer and the performer. Most frequently the platforms specialize in solving one or more types of problems<sup>10</sup>.

In the context of the modern concept of environmental management the use of the crowdsourcing platform will help in the development of systems for saving natural resources. One of the ways is application of waste and secondary resources in industrial production. When engaging secondary resources in the production, it is proposed to use a certain process (Fig. 2), which is considered as a system that consists of several subsystems.



**Fig. 2. The process of involvement waste as secondary resources in production based on the crowdsourcing platform**

In general, the process of using waste as secondary resources includes four subsystems:

- Subsystem of analysis the market of waste and secondary resources to determine the level of demand, price levels for each separate type of secondary resources and the level of proposals.
- Subsystem of monitoring secondary resources – collection and analysis of information on the availability, formation, transportation of waste and secondary resources for determining the amount, composition and other characteristics that are required to create an information database.

<sup>10</sup> Минц, А.Ю. (2013) Краутсорсинг, как метод решения задач в глобализованной экономике и особенности его использования в Украине. *Вісник приазовського державного технічного університету. Серія: Економічні науки*, 26, 85-90.

- Subsystem of analysis the involvement of waste in the production process as secondary resources.
- Subsystem of monitoring involvement projects, certificates, patents, etc., for the formation of potential areas of using waste and secondary resources.

In the practical application of the proposed system it is necessary to perform some information operations, namely: organizing information from the customer; comparison of customer and performer interfaces; processing the information received from performers.

The process of information support of the process of waste involvement as secondary resources contains a number of elements, in consequence of that the input data can be represented as:

- information on volumes and types of wastes with provision of basic data on their properties for further waste grouping;
- information on the demand at the market of secondary resources;
- information needed for the formation of the bank of projects on using secondary resources, patents, etc.

Information analysis process is carried out through statistical information and additional research provided by the use of computer technology, namely commercial database management system Microsoft SQL Server. The purpose of using the SQL Server is to make data management a self-adjustable, self-organized and self-sustained process. The SQL Server also includes support for structured and semi-structured data, including digital media formats for images, sound, video and other multimedia data. The key feature of the SQL Server is developed resource management tools (resource governor), which make it possible to effectively manage and distribute the workload by means of tracking the load level. The Microsoft SQL Server provides management tools based on the politics, advanced possibilities of reporting and analysis, and advanced tools for intellectual resources management. The product has full support of unstructured data and an improved data encryption system<sup>11</sup>.

Through optimization planning in the subsystem of analysis waste involvement as secondary resources in the production process there are selected optimal models of involvement, which in turn makes it possible to:

- find, form and design optimization models;
- generate reasonable amounts of input information;
- form mathematical models;
- carry out optimization calculations, adjust and analyze the best solutions;
- develop appropriate practical recommendations.

In connection with the above, with the purpose of active and large-scale implementation and comprehensive information support of resource-saving and ecologically-oriented projects, particular value gains the creation of a scientific and innovation center (SRC) based on the crowdsourcing platform (Fig. 3). The activities of these centers envisage the combination of scientific and industrial potential. Since this kind of projects is difficult to implement and in some cases have a great payback period, the issue of funding is very hard to settle and the support on behalf of public authorities and budgetary loans are necessary. However, to prevent corruption schemes there is needed control and supervision of SRC activities by such organizations as, for example, Entrepreneurs Committee on Issues of Environmental Protection and Management affiliated with the Commerce and Industry Chamber of Ukraine.

The mechanism of financing the resource-saving and ecologically-oriented project involves the following procedure:

- SRC address the crowdsourcing platform to obtain information support on behalf of a large number of people, the market value of the project and environmental and social responsibility is determined;
- local authorities and management bodies create the necessary legal framework for financing the work or introduce changes into the already existing one through the issuance of documents, which includes: justification for budget crediting of such projects; agreement of works with the SRC that are envisaged, and the amount of money for their funding; determine the conditions, procedures of crediting and control of lending funds that are used;
- formation of conditions and procedures of crediting;
- local authorities choose a bank that is authorized to make payments for carrying out events;
- the bank provides a target credit to the SRC under the credit agreement;
- confirmation of the target budget spending may be contracts for implementation of resource-saving and ecologically-oriented projects and agreements of transfer and acceptance of the work completed;

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<sup>11</sup> Реляционные базы данных <[http://www.realcoding.net/article/rubric/db/MSSQL\\_Server](http://www.realcoding.net/article/rubric/db/MSSQL_Server)>.

