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CROWDSOURCING AND HIGHER EDUCATION

Taking advantage of the increasing popularity of social web technologies businessmen, public figures and scientists create innovative models of outsourcing and experiment with them. One of such models is "Crowdsourcing" when companies use the Internet to combine efforts of virtual "crowd" to achieve specific organizational objectives. The article is devoted to the issues of implementation of crowdsourcing technologies in activities of higher education institution. Classification of crowdsourcing projects is developed and characteristics of their components are identified. The examples of implementation in the National University of Life and Environmental Sciences (NULES) of Ukraine are proposed.

Key words: *crowdsourcing, high school, ICT, social network, experience.*

In contemporary society the usage of informational communication technology, including the Web 2.0, presents one of the mechanisms of development. The phenomena of crowdsourcing as the technology of performing tasks of the particular specialists and delegating them to undefined, usually large group of people, in a form of the appeal, attracts more and more attention of the researchers from various scientific fields. Thus some countries engage crowdsourcing

specialists in drafting and editing of the new legislation (Saxton et al, 2013), non-governmental organization attract them in volunteer searching, and business companies use crowdsourcing services for finding solutions and creative employees.

Although the idea of crowdsourcing is not new (Estellés-Arolas, González-Ladrón-de-Guevara, 2012), the use of information technology converts Internet into a technology-oriented platform for outsourcing (Quinn, 1999) of the tasks of online community and the involvement of virtual experts to study the obtained results. As a means to implement various models of crowdsourcing projects (Burov et al, 2011) specialists use the existing social networks (Facebook or VK), wiki portals (Wikipedia.org), portals for discussions (Google Moderator) or develop their own (Witology). At the same time, it is important to maintain the control of such process and ensure qualitative results.

Experience in implementing of the crowdsourcing (for example, <http://www.crowdsourcing.ru/>) serves the reason to consider the crowdsourcing as a new business model to address the wide range of tasks: problem solving, search for project participants, software development, determining the best brand for consumer goods and other. However, the application of this technology raises new questions (such as determining an optimal level of cooperation between the users and the accumulation of collective knowledge) and generates new contradictions (for example, between the spread of knowledge and observance of copyright of intellectual property rights).

The purpose of the current article

The purpose of the current article is to identify the potential possibilities of the implementation of crowdsourcing in the educational field and to introduce the example of its realization in National University of Life and Environmental Sciences (NULES) of Ukraine (<http://nubip.edu.ua/>).

Presentation of Material

Nowadays there is a worldwide tendency for the development of classification of various types of crowdsourcing applications (*Figure 1*) for the use in different industries.

According to the tasks that are implemented using crowdsourcing technology, it is possible to allocate the following models (Burov et al, 2011):

– *Intermediary model* (e.g., InnoCentive (<http://www.innocentive.com/>)) – Internet users select and perform the tasks for which they

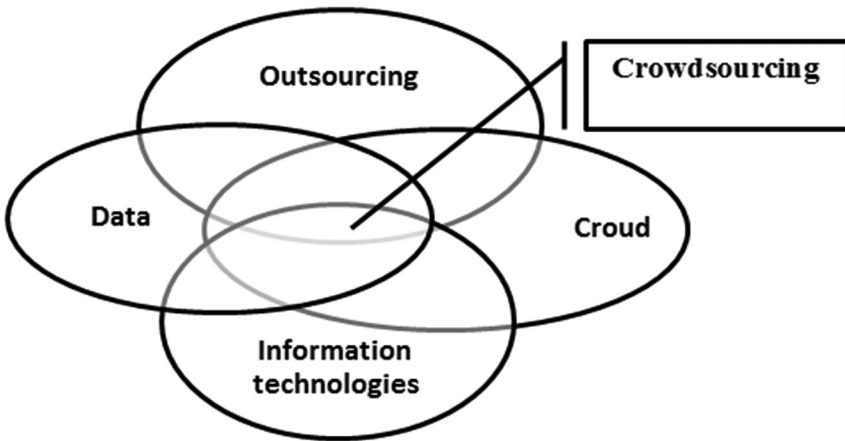


Fig. 1. Crowdsourcing components (Source: Own work based on Saxton et al., 2013)

believe are qualified, and receive monetary compensation. in this model, research and development to address community issues are performed by third parties (experts) and the users of communities face the challenge of playing the role of innovation asylum problems, such as scientists, researchers and engineers;

- *Model of collaborative software development* (for example, international platform for software testing Crowdsourcedtesting (<https://crowdsourcedtesting.com/>) – the fields of outsourcing are different at every stage – from the emergence of business idea through software development and manufacturing of the product, its testing and selling;

- *Model of selling the digital products* – crowdsourcing sites with photographs free databases (for example, iStockPhoto.com and Shutterstock.com) – is the supply chain for resale of the photos obtained from a limited number of professional photographers;

- *Model of consumer analysis* (e.g., ReeVoo.com, Buzzillions.com, ThisNext.com, Zebo.com and Crowdstorm.com, etc.) – users share their views and recommendations on products. in this crowdsourcing model consumer analysis process analysis is transmitted to online-consumers, who are motivated by the possible remuneration and play the role of consumer journalists;

- *Model of building a knowledge base* (e.g., Wikipedia.org) – model of building a knowledge base combines the intellectual abilities of people or knowledge on specific topics. This model has been

demonstrated by a "wiki" as an effective method of accumulation of knowledge, and it is currently used by Citizendium.com and Knol. Google.com with the different procedures and measures to authorship. in the crowdsourcing model of building a knowledge base, information processes or the processes of knowledge generation are transmitted to a community, and various types of motivation and quality control mechanisms are used to detect the quality of knowledge and information that can hide the "brain" of the virtual crowd;

- *Model of joint research project* (e.g., Fold.it) – the crowdsourcing platform, developed by scientists from the University of Washington)
- Internet users act as an assistant rewriting distorted text, searcher of materials for research, appraiser of the results and other.

The advantage of crowdsourcing in education (Zidkiva, 2013) can be seen in the possibility of implementing the access to competent and talented people from different groups, universities or even countries, thereby significantly optimizing the cost and time to obtain the results that are relevant for the universities.

Given the mobility of students and globalization of education it is important to pay attention to the use of crowdsourcing technologies as a tool to obtain feedback and to develop optimal solutions for the improvement of the university management structure (e.g., http://bg.ru/city/vuzy_perehodyat_na_kraudsorsing-9507/), improving the efficiency of educational process and scientific activity, the development of relationship marketing in university (Buzueva, 2013), as well as to study the efficacy of this tool (Bloodgood, 2013).

Researching the effectiveness of the implementation of crowdsourcing in university, we relied on the assumption that the crowdsourcing perfectly fits into the university model as a tool to ensure the following:

- *relationship marketing* – students and academic staff acquire practical experience in solving issues of current interest for the university, their sense of belonging and influence on community life of the university increase, and the management - feedback and the opportunity to work out optimal solutions;

- *quality of the suggested solution* – students and teachers participate in the processes within the university, so they better know what really meets their needs and demands;

- *practical implementation* – teachers and students can simulate the problem or the suggested solution during classes and work

out advantages and disadvantages of its use, as well as the options for its improvement or optimization;

- *positive PR* – active participation of students and teachers enhances the university's prestige;

- *cost saving* – even under condition of bonus awards to the most active and “important” members, crowdsourcing is more economical than traditional ways of problem solving.

One of the areas of implementation of innovative teaching models of NULES of Ukraine is the development of the system of support for the educational and scientific communication in training university masters and search technology combination of formal and informal education. Therefore, the masters of the Faculty of Information Technology, as well as the members of the scientific community of university students were actively participating in this study.

According to the results of the analysis of the implementation of crowdsourcing technology conducted as part of the course “Global Information Resources” (<http://elearn.nubip.edu.ua/course/view.php?id=228>), the characteristics of the main components (*Table 1*) were identified and the classification of educational crowdsourcing projects was developed:

- *by the Industry of the Use* (research, educational and social projects, organizational, entrepreneurial and innovation activity);

- *by the Type of Tasks* (creating a product or content, solution search, search for people and assets, the collection of data, opinions, ideas).

Although the implementation of “crowdsourcing as innovation”, “problem solving” and “scientific development (R & D)” is quite attractive, it is more appropriate to apply the technology of crowdsourcing in university to address more “mundane” tasks, such as developing of the branding of university or conducting career guidance campaign. Such projects can serve as a good start for applying the crowdsourcing in university, as young people generally will to use modern technology, network interaction for them is a part of everyday life, and the desire to take an active part and responsibility for their own lives and the enormous potential of ideas requires real actions.

To introduce the example let us consider the project the Emblems of NULES, created on the basis of the crowdsourcing model of consumer analysis.

Project aim – formation of loyalty to the university and creation of a positive image.

Table 1

Crowdsourcing components characteristics

| № | Component | Characteristics |
|---|--|--|
| 1 | Outsourcing task (problem) | a. Modularity (possibility of splitting the task into modules (microtasks)); b. Easy to split and hand over to crowdsourcing. |
| 2 | Community (crowd) | a. Diversity (community should consists of independent people); b. Decentralization (preferably, but not necessarily); c. Pervasiveness of problem-solving know-how; d. Motivation. |
| 3 | Experts (are engaged to process data accumulated by the community) | a. Experience-good orientation; b. The number of experts has to be justified by the scale of the task to be solved. |
| 4 | Results (required for problem solving) | a. Possibility of distance work with data; b. Crowdsourcing result should be easily processed for further use. |
| 5 | Information technology | a. Pervasiveness and low cost; b. Probability of crowdsourcing. |

The anticipated result – development of emblems and manufacturing of marketing products. The participants of the project (attracted in the form of an open call) have become the students, alumni and the faculty. The university group in Vkontakte (*Figure 2*) was chosen as the platform for implementation.

As a result, the types of marketing products have been identified, design has been developed, money has been collected and T-shirts, sweatshirts and cups were produced, as well as planning of activities on the university promotion (branding elements) have been made. The complexity of this project implementation includes complex moderation at the initial

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Fig. 2. Page of university group in Vkontakte
(Source: http://vk.com/top_people_studnubip)

stage – social network Vkontakte is the most popular among students, but not the best one for crowdsourcing projects. However, identifying opinion leaders among active and “productive” members, who became the moderators of separate tasks (fundraising, logo design, selection of products and the ways to produce them), strengthened the composition of the student council of the university and led to the expansion of this project – development and maintenance of the Internet-store Emblems of NULES of Ukraine (Figure 3).

The poll conducted during and after the project showed that the obtained results of the project surpass the results obtained by specialists to an order: cost saving was rated as positive by 95 % of the university departments heads, but 32 % of students; increase of loyalty to the university – 96 % of participants from different categories (an average provided); creation of a positive image – 40 % of teachers and 80 % of the university students (the survey findings require deeper analysis).



Fig. 3. Page of Internet-store Emblems of NULES of Ukraine
(Source: <http://store.studnubip.com/how-to-order/>)

According to the results of the Internet-store Emblems of NULES of Ukraine project analysis, with the participation of the master's students of the IT faculty and the representatives of student government, the author of the current paper has developed the model of assessing the crowdsourcing technology (Figure 4) use effectiveness for a specific task (Table 1).

In addition, it is important to determine the skills of crowdsourcing projects organizer, namely: the ability to set the right tasks that are interesting for uncertain or potential participants, the ability to engage participants (establishing an emotional bond), the ability to create real projects based on the content that is formed by the participants in the process of crowdsourcing implementation. A teacher, or, for example, a head of the student council or scientific society can be the moderator of a crowdsourcing project in higher education establishment. However, experience shows that the crowdsourcing “experts” can be the so-called opinion leaders revealed in the course of its implementation. When introducing crowdsourcing it is important to determine the purpose of introduction, which should be preferably clearly written down, formulate goals and split them into microtasks, determine potential project participants (for instance, identify the target

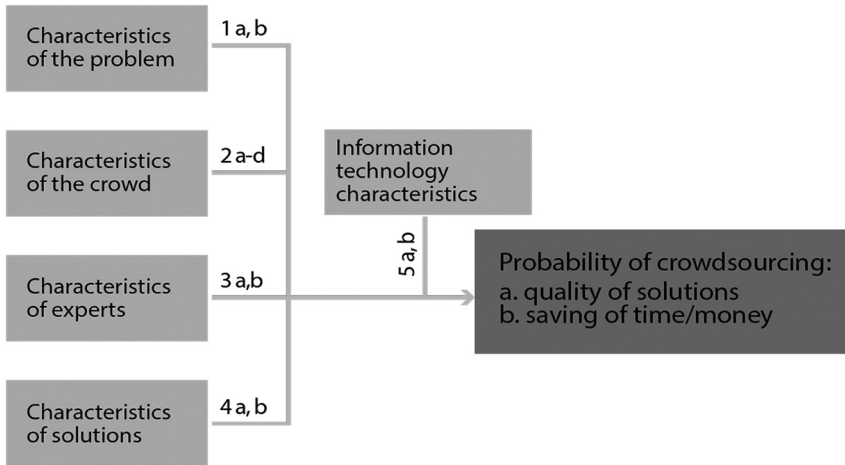


Fig. 4. The model of assessing the crowdsourcing technology use effectiveness for a specific task

groups of participants, such as students studying at different faculties, future applicants, teachers and future teachers, etc.), determine the way of attracting and motivating the online community, handing over certain tasks to the crowd. The next step is to determine a crowdsourcing model that is best suited for the set task and choose technology platform for its implementation. In the process of implementation of the crowdsourcing project, it is important to continuously monitor the user activity and conduct filtering, statistical and analytical analysis of the suggested solutions. In the event of professional platforms, most of these functions have been already implemented; otherwise, extra moderation and expert assessment are required. After crowdsourcing project, it is important to assess the effectiveness of implementation and determine the feasibility of crowdsourcing use for the specific task (Figure 4).

Conclusion

The analysis of actuality and models of implementation of crowdsourcing technology in university activity allows to state its advantages:

- access to talented and creative students and teachers, or intensifying their activities through extra motivation and the possibility to acknowledge the suggested solutions;

- a significant number of solution options and the possibility to choose the optimal one;
- improving the quality of the results: professionals are limited by their professional knowledge and best practices, while students and external online experts are unrestricted in finding solutions;
- optimization of the results, time and cost saving;
- formation of marketing relationships of the participants of the academic process and research activities of the specific university and their decentralization.

Nevertheless this instrument cannot be considered to be universal – while forming the “crowdsourcing task” it is necessary to be sure that crowdsourcing is an optimal solution in particular case. That is why further research can be seen in the development of the crowdsourcing practice in university, creation of training system and research projects along with the involvement of new participants in the Internet community. Increasing number of diverse projects (in terms of both application and participants, their division into groups and ICT used as a platform for implementation) should fill the base of results for the examination of crowdsourcing projects in order to create the models of implementation of educational crowdsourcing in university and the guidelines for its realization in a particular institution.

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