# HARNESSING INNOVATION POTENTIAL OF CROWDSOURCING

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**Abstract**

*The new innovation paradigm is based upon articulation of external and internal sources of innovation. Nowadays, crowdsourcing is coming up as significant external source in innovation processes of the companies. Crowdsourcing enables harnessing of initiatives, ideas, solutions and knowledge of the crowd so as to enhance innovation performance and induce a value creation. Given that existing innovation literature does not cover sufficiently the issues related to crowdsourcing this paper is to offer an additional views about innovation potentials of crowdsourcing thus contributing for future research on this relatively unexplored concept.*

*Therefore, this paper aims at considering key insights about crowdsourcing contribution on developing companies' innovation capacity. More specifically it is focused on identification of benefits, weaknesses and risks arising from crowdsourcing to the innovation process comprising conceptual and empirical aspects.*

**Keywords**: *Crowdsourcing, innovation, crowd, knowledge, innovation potential*

## 1. Introduction

Nowadays, innovation is a driving force of the companies' success and competitiveness in the global market. Consequently, companies are faced with the challenge to redesign traditional concept of innovation and develop new innovation methods in order to achieve a competitive advantage. The emergence of crowdsourcing enables integration of external resources into the concrete innovation projects of the companies. In fact, it uses the potential of collective intelligence in order to achieve a certain goal.[1] Crowdsourcing is mainly a consequence of intensive and dynamic ICT development. It "harnesses the power of today's communication technologies to liberate the potential which exists in large pools of people"[2].

Many companies that usually conducted their own R&D activities for solving specific problems or developing new products are increasingly distributing these activities through online crowdsourcing platforms such as InnoCentive, CrowdSpring, TopCoder, uTest. At the same time, some companies (Procter & Gamble, Starbucks, Dell, Best Buy, Nike) create their

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[1] Levy, P. 1997. Collective Intelligence: Mankind's Emerging World in Cyberspace Cambridge: Perseus Books
[2] Howe Jeff, 2009, Crowdsourcing, Why the Power of the Crowd is Driving the Future of Business, www.crownpublishing.com.

own digital platforms that allow customers to generate new ideas and products. Thus, solutions and proposals of the crowd are being progressively used in innovation process of the company. The emergence of crowdsourcing has significantly changed the traditional approach to innovation based primarily on in-house research or outsourcing tasks to contractors. At present, internal R&D efforts are being supplemented or even supplanted, by leveraging a variety of sources for knowledge 'inflows' including suppliers, partners, customers, competitors, academic researchers, etc.[3] Therefore, it implies redefining of innovation methods, expanding innovation possibilities and providing more efficient ways for improving companies' innovation performance by exploiting creative potential of the crowd.

## 2. Crowdsourcing: a conceptual framework

Although the concept of crowdsourcing has emerged less than a decade ago, in a very short period it has drawn attention of scientific community generating many discussions, comments and analyses in the context *of its conceptual clarification. Jeff Howe has introduced crowdsourcing concept in recent literature giving the initial impetus for further research. According to Howe, crowdsourcing is the act of company or institution taking a function once performed by employees and outsourcing it to an undefined (and general large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaborative), but is also often undertaken by sole individual.*[4] Consequently, a key feature of crowdsourcing is an open call for taking a certain activity that can't be implemented with the internal resources of the company. The open call allows participation of a broad network of individuals, companies and institutions. The participation in the crowdsourcing is voluntary and the contribution of a wide network of people is required for the initiative to reach a substantial scale. Therefore, sufficient crowd participation is imperative for the success of a crowdsourcing initiative.[5]

However, it should be stressed that the open call is announced to the crowd with different scale of experience, skills and knowledge. This means that companies which use a crowdsourcing approach, do not use a predefined group of experts or individuals with professional knowledge and skills, but they outsource functions to an undefined network of people. Therefore, it comes out that its basic features are: a large number of participants, heterogeneity of participants and voluntary participation.[6] It is worth noticing that very often the open call is looking for proposals, ideas and solutions for which a specific knowledge and competence is required. Thus, even though the call is directed to an undefined group of people it inherently have selective nature. Therefore, some authors differentiate selective approach and integrative approach to crowdsourcing. In the integrative approach, the strategy is to pool broad numbers of information and data from a large, undefined network of people. In the selective crowdsourcing, the strategy is to tackle a specific issue that needs a defined group of people with specific skills. This might happen usually in the form of an idea contest or other types of open innovation.[7]

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[3] Chesbrough, H., 2006, Open Innovation: A New Paradigm for Understanding Industrial Innovation. *In Open Innovation: Researching a New Paradigm*, Oxford University Press & Cahalane, M.,Feller, J.,Finnegan, P.,2013, Peer Produced Innovation, An Exploration of 'the Wisdom of Crowds' in Virtual Worlds, *Proceedings of the 21st European Conference on Information Systems.*

[4] Howe, J. 2006. The Rise of Crowdsourcing. *Wired magazine* 14 (6).

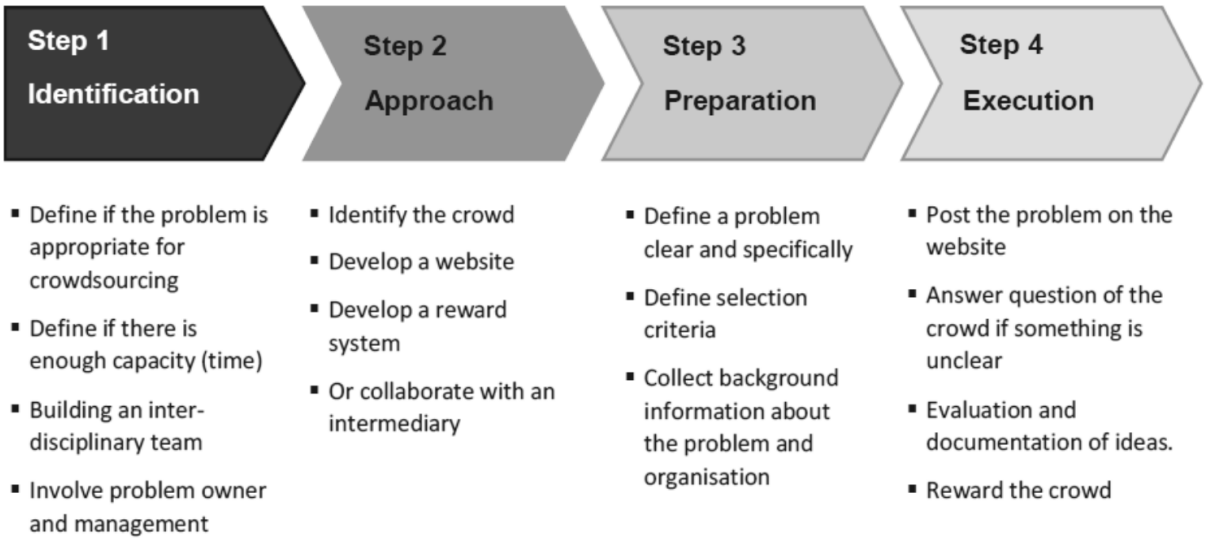
[5] Ankit Sharma, 2010, Crowdsourcing Critical Success Factor Model, *Strategies to harness the collective intelligence of the crowd*, Working Paper 1.

[6] Tanja Aitamurto, Aija Leiponen, Richard Tee, 2011, The Promise of Idea Crowdsourcing – Benefits, Contexts, Limitations, www.ideasproject.com.

[7] Pia Erkinheimo, Paul Dombowsky (2013), Crowdsourcing and Open Innovation for Enterprises, Ideavibes.

More recent definitions involve multiple aspects and highlight more features of the crowdsourcing attempting to explain its complexity. In this context, it is noted that crowdsourcing represents a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call. The undertaking of the task, of variable complexity and modularity, and in which the crowd should participate bringing their work, money, knowledge and / or experience, always entails mutual benefit.[8]

Figure 1. Phases of crowdsourcing




Source: Hay Group

According to the methodological framework created by Hay Group, crowdsourcing in practice is implemented in four subsequent steps: identification, approach, preparation and execution. Each of these steps incorporates a set of activities with purpose to ensure successful realization of the projected goal. (Figure 1)

### 3. Innovation oriented crowdsourcing: potentials and weaknesses

In practice crowdsourcing is being implemented through various methods focused on achieving different goals. However, only certain methods affect innovation process and innovation performance of the companies. Recent research makes difference between crowdsourcing of inventive activities, crowdsourcing of routine activities and crowdsourcing of content. It has to be emphasized that only inventive activities produce innovation impact by allowing the crowd to solve problems that the firm would not or could not solve internally. However, the crowd only brings the solution and not the practical way to implement the solution (commercialization or industrialization phase). It remains for the firm to industrialize the solution proposed by the crowd, to make it operational.[9] Similar typology is being offered by Schenk and Guittard comprising three types of crowdsourcing: crowdsourcing of complex tasks, crowdsourcing of creative tasks and crowdsourcing of routine tasks. Fulfilling the complex and creative tasks by the crowd include innovation input to the companies by providing solutions for problems and harnessing creativity of the crowd for obtaining novel ideas. According to Howe crowdsourcing includes four models: collective intelligence, crowd

[8] Estellés-Arolas, Enrique; González-Ladrón-de-Guevara, Fernando (2012),"Towards an Integrated Crowdsourcing Definition", *Journal of Information Science.*

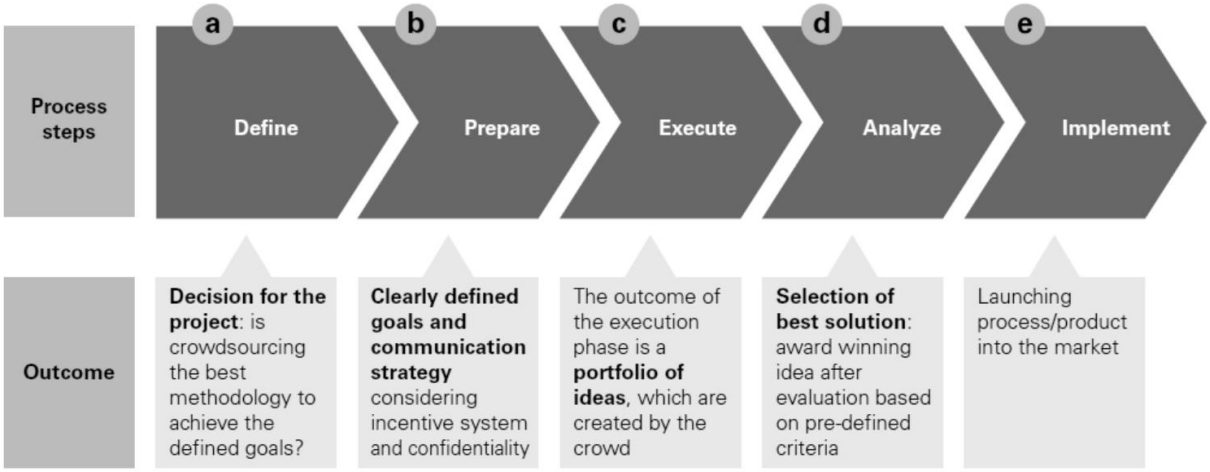
[9] Thierry Burger-Helmchen, Julien Pénin, 2010, The limits of crowdsourcing inventive activities: What do transaction cost theory and the evolutionary theories of the firm teach us?.

creation, crowd voting and crowd funding, where collective intelligence and crowd creation are models that support crowdsourcing innovation.

It is evident that recent literature perceives 'Crowdsourcing Innovation' as a particular way to open up the innovation process, using large networks of individuals to access, capture and explore external knowledge, technologies and competencies. In other words, this concept is based onbringing the "wisdom of crowds" into the company to help it innovate.[10] Crowdsourcing is based upon research collaboration that radically enlarges the pool of potential scientific collaborators.[11]

Pointing to the innovation aspects of crowdsourcing certain authors use the notion crowd innovation.[12] Following the Erl, et al.[13] the implementation of crowd innovation initiatives is completing in five steps: define, prepare, execute, analyse and implement (Figure 2). The defining phase determines if the crowd innovation is the best option for creating ideas and solutions to a given problem of the company. The preparation phase outlines the goals, the communication strategy and the challenge to solve, while the execution phase comprises communication with the crowd and ideas generation. The ideas are then analyzed according to the criteria that have been defined during the preparation phase and the winner of competition is selected. Finally, during the implementation phase the innovation is launched to the market or the new solution is incorporated in the organization.[14]

**Figure 2. Crowd innovation process overview**




Source: Arthur D. Little analysis

Boudreg and Lakhani[15] identified four distinct forms through which innovation impact of crowdsourcing is provided: contest, collaborative community, complement and labor market. The contest is considered to be most effective method when the problem is complex or novel or has no established best-practice approaches. It allows generation of high value solutions through large scale and diverse independent experimentation. Collaborative

[10] Oliveira F., Ramos I., Santos L., 2010, Definition of a crowdsourcing Innovation Service for the European SMEs, Current Trends in Web Engineering, Vol.6385.
[11] Thierry Buecheler, Jan Henrik Sieg, Rudolf M. Füchslin and Rolf Pfeifer, (2010) Crowdsourcing, Open Innovation and Collective Intelligence in the Scientific Method: A Research Agenda and Operational Framework, Proc. of the Alife XII Conference, Odense, Denmark, 2010.
[12] Hans-Peter Erl, Michaël Kolk, Andreas Deptolla, Fabian Sempf, 2012, Crowd innovation fosters new business opportunities, How business can profit from group-oriented innovation approaches, Prism / 2 / 2012.
[13] Ibid.
[14] Ibid.
[15] Kevin J. Boudreg, Karim R.Lakhani, 2013. Using the Crowd as an Innovation Partner, April 2013 Harvard Business Review.

communities include aggregating a large number of diverse contributions into a value-creating. They are most effective when tackle projects whose orchestration is relatively simple. Complementor is the third type of crowd-powered innovation where the core product or technology is effectively transformed into a platform that generates complementary innovations. Finally, Crowd Labor Markets contribute to efficiently and flexibly matching talents to discrete tasks.

In addition, innovation oriented crowdsourcing can be observed as competitive or collaborative. According to the competitive approach, community members offer multiple solutions for a specific problem from which further winning solutions will be selected. On the other hand, the collaborative approach enables solutions to be offered and amended openly by the community and participants to learn among each other achieving a synergy effect.[16]

Crowdsourcing innovation benefits can be evaluated from different aspects and include various forms. According to Reichwald and Piller mobilization of consumers in the value creation process involve four benefits for firms. These are the reduction of the time it takes to develop new products ("time-to-market"), the reduction of the costs of innovation ("cost-to-market"), the increase of market acceptance of new products and consumers' willingness to buy them ("fit-to-market"), and the increase of consumers' subjective perception of the actual newness of a new product ("new-to-market").

Having in mind the above considerations it comes out that crowdsourcing offers many innovation benefits for companies, such as:

- it allows a broader range of solutions, ideas and initiatives than can be obtained from internal sources of the company;
- companies can easier identify user needs and adjust the offer according to user tastes and preferences;
- crowdsourcing very often can provide a cost-effective innovation solutions;
- in certain cases it can offer a faster solution than in-house research;
- it enables a multiplier effect. A new idea, product or service introduced and discussed within the organization will often lead to generation of additional new ideas[17]
- it enables the outsourcing of the risk of failure since the firm only pays the crowd for successful performance[18].

However, despite the above mentioned advantages innovation-oriented crowdsourcing incorporates multiple weaknesses and risks. Recent studies point out that crowdsourcing is not a method that can be effective for radical innovation, i.e. it is primarily suitable for incremental product innovation. The crowd contribution in generating new product ideas to a large extent depends on the nature and complexity of the industry or product category and the needed amount of knowledge to innovate. If required knowledge is more specific and complex there is possibility for lower crowd involvement in innovation. Most recent studies indicate if knowledge-based entry barriers are low and/or the knowledge needed to come up with successful ideas is closely linked to aspects of user experience users might be more successful in the innovation process[19]. Actually, users might generally be better at solving needs-based problems (e.g., novel functionality) and worse at technology-based problems (i.e., dimensions of merit).[20]

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[16] Ye Weiwei, Crowdsourcing for Collaboration-Oriented Innovations, Social Science Letters, ISSN: 2163-4130, Volume 1, Number 1, December, 2012 & Le, Q., Panchal, Jitesh H., Modeling the effect of product architecture on mass-collaborative processes, *Journal of Computing and Information Science in Engineering*, vol.11, issue (2011).

[17] Hans-Peter Erl, Michaël Kolk, Andreas Deptolla, Fabian Sempf, 2012, Crowd innovation fosters new business opportunities, How business can profit from group-oriented innovation approaches, Prism / 2 / 2012.

[18] Thierry Burger-Helmchen, Julien Pénin, 2010, The limits of crowdsourcing inventive activities: What do transaction cost theory and the evolutionary theories of the firm teach us?.

[19] Lettl, C., C. Herstatt, and H. G. Gemünden, 2006; & Marion K. Poetz, Martin Schreier, 2012.

[20] Ibid.

In addition, innovation management shortcomings are emerging as restraining factor for harnessing crowdsourcing innovation potential. In this context, the main reason companies resist crowds is that managers don't clearly understand what kinds of problems the crowd really can handle better and how to manage the process.[21] In fact, for crowdsourcing to be effective tasks need to be focused and clearly explained and the firm needs to have procedures in place for effectively filtering and considering ideas that come in.[22] Besides this, crowdsourcing is mainly enabled through the technology of the web. Hence, certain infrastructural barriers such as: access to computers, access to the web and access to high-speed connections, may limit harnessing of crowdsourcing potentials.[23]

Furthermore, the critics point to the possibility that crowdsourcing can increase the chances of failure in innovation efforts, due to factors such as: diminished and distributed ownership of a problem; difficulties in monitoring the quality of work and in managing a project; challenges in maintaining a working relationship with crowdsourced workers throughout the duration of a project; as well as vulnerability to faulty results caused by malevolent work efforts- for example by a competitor.[24]

Erkinheimo and Dombowsky (2013) identify a number of risks related to implementation of crowdsourcing, such as: a) Confusion by the crowd caused by lack of clarity the task given to it; b) Low participation due to lack of awareness of the audience/ resource that a company wish to reach and their behaving patterns; c) Gamification by special interest groups or individuals; d) Controversy over IP ownership after idea is submitted, originality of idea (relates to the ownership mentioned above); e) The crowd stops participating due to the perception the organisation is non-responsive to their input; f) Reduced internal capacity for innovation caused by a misdirected sense on the part of management that the 'crowd can do it all'.

## 4. Conclusions

Crowdsourcing is still a relatively new concept that is not sufficiently explored in existing literature. In this paper we have analyzed crowdsourcing potentials for supporting innovation processes in the companies. We found that crowdsourcing significantly expands the innovation potential and opens new opportunities for augmentation of companies' innovation. The analysis of contemporary empirical and theoretical considerations indicates that crowdsourcing enables faster and broader access to innovative ideas and solutions that can be implemented with relatively low costs. At the same time, a number of weaknesses have been identified diminishing or limiting the crowdsourcing innovation impact. In this context, it is emphasized the relevance of knowledge-based barriers, the shortcomings in innovation management of the companies infrastructural barriers, etc. Therefore, the prospective challenge to the companies is to develop methods that will enable effectively to deal with constrains so as to harness the potential benefits of crowdsourcing. Finally, it is noteworthy to be mentioned that complex interactions coming up from a range of participants leave significant room for further research.

[21] Kevin J. Boudreg, Karim R.Lakhani, 2013.Using the Crowd as an Innovation Partner, April 2013 Harvard Business Review.

[22] Hempel, J. (2007). Tapping the wisdom of the crowd. Business week. Retrieved October 2, from http://www.businessweek.com/innovate/content/jan2007/id20070118_768179.htm.

[23] Brabham, C. Daren 2008, Convergence: Crowdsourcing as a Model for Problem Solving, An Introduction and Cases, *The International Journal of Research into New Media Technologies*, Vol 14(1), 2008 Sage Publications

[24] Cove, 2007; McNichol, 2007; McDonald, 2007; Stranieri, 2006; Marjanovic et al., 2012.

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