Crowd Sourcing: A Primer

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Abstract – Crowd sourcing is the process of getting work done by online community or crowd of people in the form of an open call, the voluntary undertaking of a task. It allows businesses and organizations to use multiple sources to develop solutions for their problems. Users can participate remotely from anywhere in the world by using their own devices and perform tasks in exchange for monetary rewards. The underlying principle of crowd sourcing is that more heads are better than one. This paper provides a brief introduction to crowd sourcing -- what it does, how it works, and its limitations.

Keywords: crowd sourcing, crowd wisdom, crowd creation, crowd funding, crowd democracy

I.   INTRODUCTION

The phrase "crowd sourcing" is a combination of the words "crowd" and "outsourcing."
It was coined in 2005 by Jeff Howe and Mark Robinson to describe how businesses were using the Internet to "outsource work to the crowd" [1]. Crowdsourcing has emerged as a powerful, effective way of allowing people leverage the crowd's intelligence and wisdom toward solving problems. In some applications, crowd source workers are typically recruited in ad hoc manner to perform a task and are often rewarded with some incentive.

Crowd sourcing is an Internet-based activity in which an organization or company asks a group of individuals to undertake a task that is traditionally performed by an employee. It is a collaborative way of solving a problem using many people or resources. It is based on a simple underlying concept: more heads are better than one and virtually anyone can contribute valuable information. It operates on Web 2.0, which enable networked experts to work collaboratively on a specific task by bringing the experts together in a global village. It is particularly useful when the power of crowds of people is employed on a task that is costly or time consuming with traditional methods. The main advantage for a company to outsource to an online community rather than performing the task in-house is that the company can gain access to a wide range of skills and expertise outside the company.

Our increasingly mobile world population allows for people to contribute from anywhere. Mobile crowdsourcing allows activities to take place on mobile phones or platforms. It has been applied in crowd-sourced traffic monitoring, road-traffic delay estimation, location-based games aimed at collecting geo-spatial data, collaborative traffic signal schedule advisories, and indoor localization services [2].

II.   APPLICATIONS

The clear benefits of crowd sourcing include speed, quality, improved costs, flexibility, scalability, and diversity. It offers individuals in the crowd an opportunity to use their creative energy and the benefit of making themselves entrepreneurs in freelance work [3].

Crowd sourcing can be applied to any discipline to collectively solve a problem and share its solution. It has been used in business, education, engineering, computing, astronomy, genealogy, humanities, information systems, energy systems, journalism, linguistics, health-care, genomics, anatomy, navigation, agriculture, planning, and governments. Examples of crowd sourcing include [4]:

- The collection of words for the Oxford English Dictionary (OED). The creation of this dictionary involved hundreds of co-creators from many countries.
- The development of Wikipedia. Instead of Wikipedia creating an encyclopedia by hiring their own editors, they gave the task to a crowd of individuals. This leads to a crowd of people creating a great resource.
- Crowdfunding, which is the means of funding projects by a multitude of people contributing a small amount of money via the Internet. Crowdfunding is used by charities and start-ups asking people to donate money to their project.
- Facebook has used crowdsourcing to create different versions of its site in different languages and local cultures.
- The Federal Communications Commission (FCC) is using crowd sourcing to gather ideas on how to best build the broadband infrastructure.
- Crowd sourcing has been used by governments at all levels to recruit police, soldiers, and firefighters. It can be used for searching and reporting crimes.

Other well-known examples include smart city, translation, book review sites, YouTube, Flickr, Linux, Yahoo! Answers, SurveyMonkey, and Amazon's Mechanical Turk (www.mturk.com) [5].

III.   LIMITATIONS

There are at least five major limitations and controversies about crowdsourcing [1]:

- *Impact of crowd sourcing on product quality*: It allows both qualified and unqualified people to participate, resulting in large quantities of unusable contributions.
- *Entrepreneurs contribute less capital themselves*: It simplifies the capital-raising process and allows entrepreneurs to spend more time on the project itself.
- *Increased number of funded ideas*: It is beneficial because it allows niche ideas that would not survive venture capitalist. When the raw number of projects grows, the number of possible failures can also increase.

- *The ethical implications of low wages paid to crowd workers*: Typically, no written contracts or agreements are made with crowd workers.
- *Security problems and data privacy*: This is particularly of concern when social media are involved. People participate in crowd sourcing with different motivations and it is a challenge to know their real identity [6].

Crowdsourcing raises some ethical concerns: outsourcing companies are replacing their own highly-paid employees with much lower-wage labor from the outside. Some express their concern that crowdsourcing programs could be exploited as sources of cheap labor. The talented individuals performing the outsourced tasks may not be interested in results of high quality but rather their payment. Another major concern is intellectual property theft. Smaller companies may not have the financial resources to protect their intellectual property. It is needless to say that crowdsourcing will not be effective when the project being worked on is secretive in nature [7].

IV.   CONCLUSION

Crowd sourcing is a new culture of open innovation, typically supported by crowdfunding. This innovation employs human capabilities and talents to solve problems through collective intelligent and idea collaboration for the greater good. Crowd sourced projects often require time and effort in coordinating them. A crowd sourcing project should be clearly defined and sufficiently challenging to attract people who will donate their time or money [8].

  Crowd sourcing is still emerging as a distributed, web-based problem-solving and data-gathering business production model. It is here to stay. It is radically changing the way institutions, governments, and corporations handle problems [9]. It has also introduced new possibilities for integrating human computation with intelligent devices. It has become a popular means of harvesting knowledge from the masses.

REFERENCES

i.   "Crowdsourcing," Wikipedia, the free encyclopedia, https://en.wikipedia.org/wiki/Crowdsourcing

ii.   G. Chatzimilioudis et al., "Crowdsourcing with smartphones," IEEE Internet Computing, September/October, 2012, pp. 36-44.

iii.   D. C. Brabham, "Crowdsourcing as a model for problem solving: An introduction and cases," Convergence: The International Journal of Research into New Media Technologies, vol. 14, no. 1, 2008, pp. 75–90.

iv.   "List of crowdsourcing projects," Wikipedia, the free encyclopedia, https://en.wikipedia.org/wiki/List_of_crowdsourcing_projects

v.   A. Doan et al., "Crowdsourcing applications and platforms: Data management perspective," Proceedings of the VLDB Endowment, vol. 4, no. 12, 2011, pp. 1508-1509.

vi.   S. Shafiee, H. Shafiee, and F. Mortazavi, "Security of Crowd Sourcing," Proceedings of the 10th International Conference on e-Commerce with a Focus on Tourism, April 2016, pp. 1-6.

vii.   P. Whitla, "Crowdsourcing and its application in marketing activities,"

viii.   Contemporary Management Research, vol. 5, no. 1, March 2009, pp. 15-28.

ix.   P. Dutil, "Crowdsourcing as a new instrument in the government's arsenal: Explorations and considerations," Canadian Public Administration, vol. 58, no. 3, Sept. 2015, pp. 363-383.

x.   S. Greengard, "Following the Crowd," Communications of the ACM, vol. 54, no. 2, February 2011, pp. 20-22.

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