The scientific state of the art in Crowdsourcing

An overview of Crowdsourcing, its different facets, challenges and criticisms

Diego Barbera
1327823

Viktor Kvaternjak
1328111

Andreas Ntaflos
0326302

Richard Plangger
1025637

Christian Schnitzer
0828380

Konrad Steiner
0927159

ABSTRACT

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam congue lorem ut lorem lacinia, at pharetra dui tincidunt. Curabitur blandit enim nulla, vitae varius risus aliquam ut. Etiam at leo felis. Suspendisse potenti. Sed malesuada lacus vestibulum cursus ornare. Sed eu purus hendrerit, consequat ante sagittis, auctor quam. Donec elit massa, pellentesque ac gravida vitae, pellentesque a nulla. In molestie dolor tristique luctus adipiscing. Nunc iaculis aliquet leo vel vestibulum. Integer eu lacus vehicula, vestibulum mi at, tincidunt leo. Sed ornare nunc vel lectus sagittis, auctor ultricies massa porttitor. Nullam sit amet condimentum lacus, sed vehicula enim. Aliquam in sem elit. Duis pretium mi at dignissim placerat.

1. INTRODUCTION

The term *crowdsourcing* has been coined by Jeff Howe in 2006 [9] as a portmanteau of *crowd* and *outsourcing*. He describes it generally as outsourcing work to an "undefined, generally large group of people in the form of an open call" [10]. The term and the underlying practice are still quite young and the theoretical backgrounds—What is a crowd? What motivates the crowd? Why do some crowdsourcing systems and initiatives thrive while others fail miserably?—are still being researched, for example in the works of Daren Brabham [3, 4, 5]. This is why in scientific literature we find various, often directly conflicting definitions of crowdsourcing [7], as well as conflicting classifications of existing systems and initiatives; some authors see Wikipedia or Youtube as crowdsourcing examples while others claim the exact opposite [7].

In this paper we give an overview of crowdsourcing by discussing an integrated definition of the term and practice as put forth by Estellés-Arolas and González-Ladrón-de-Guevara in [7] and examining current crowdsourcing systems and platforms based on that definition. We also compare the motivations and composition of different kinds of crowds for different kinds of problems and how these crowds often differ

widely in these regards. Next we describe broadly how to design a crowdsourcing initiative to be successful and which steps can be taken to control reliability and quality of work. Finally we discuss some critical aspects of and problems with crowdsourcing which are often overlooked or ignored in current literature.

2. CROWDSOURCING DEFINED

The most comprehensive definition of crowdsourcing has been compiled by Estellés-Arolas and González-Ladrón-de-Guevara. In their work [7] the authors analysed a large number of existing definitions and extracted various characteristics that apply to a crowdsourcing system, resulting in the following:

> Crowdsourcing is 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 voluntary undertaking of a task. 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. The user will receive the satisfaction of a given type of need, be it economic, social recognition, self-esteem, or the development of individual skills, while the crowdsourcer will obtain and utilize to their advantage that what the user has brought to the venture, whose form will depend on the type of activity undertaken.

Based on that definition all of the following characteristics, as identified in [7] apply to a crowdsourcing system:

(a) There is a clearly defined crowd
(b) There exists a task with a clear goal
(c) The recompense received by the crowd is clear
(d) The crowdsourcer is clearly identified
(e) The compensation received by the crowdsourcer is clearly defined
(f) It is an online assigned process of participative type
(g) It uses an open call of variable extent
(h) It uses the internet

Having identified the characteristics that describe a crowdsourcing system it is now easy to see that neither Wikipedia, nor Youtube qualify as such. For Wikipedia the missing characteristics are (d), (e) and (g), while for Youtube only (a) and (h) even apply; all others do not.

3. OVERVIEW OF CROWDSOURCING SYSTEMS AND PLATFORMS

4. DIFFERENT CROWDS FOR DIFFERENT PROBLEMS

5. CHALLENGES IN CROWDSOURCING INITIATIVES

6. CRITICAL CONSIDERATIONS OF CROWDSOURCING

7. CONCLUSION

8. REFERENCES

[1] O. Alonso, D. E. Rose, and B. Stewart. Crowdsourcing for relevance evaluation. In *ACM SigIR Forum*, volume 42, pages 9–15. ACM, 2008.

[2] M. Antikainen, M. Mäkipää, and M. Ahonen. Motivating and supporting collaboration in open innovation. *European Journal of Innovation Management*, 13(1):100–119, 2010.

[3] D. C. Brabham. Crowdsourcing as a model for problem solving: An introduction and cases. *Convergence: the international journal of research into new media technologies*, 14(1):75–90, 2008.

[4] D. C. Brabham. Moving the crowd at istockphoto: The composition of the crowd and motivations for participation in a crowdsourcing application. *First Monday*, 13(6), 2008.

[5] D. C. Brabham. Moving the crowd at threadless: Motivations for participation in a crowdsourcing application. *Information, Communication & Society*, 13(8):1122–1145, 2010.

[6] A. Doan, R. Ramakrishnan, and A. Y. Halevy. Crowdsourcing systems on the world-wide web. *Communications of the ACM*, 54(4):86–96, 2011.

[7] E. Estellés-Arolas and F. González-Ladrón-de Guevara. Towards an integrated crowdsourcing definition. *Journal of Information science*, 38(2):189–200, 2012.

[8] J. J. Horton and L. B. Chilton. The labor economics of paid crowdsourcing. In *Proceedings of the 11th ACM conference on Electronic commerce*, pages 209–218. ACM, 2010.

[9] J. Howe. The rise of crowdsourcing. *Wired magazine*, 14(6):1–4, 2006.

[10] J. Howe. *Crowdsourcing: Why the Power of the Crowd is Driving the Future of Business*. Three Rivers Press, 2009.

[11] T. Hoßfeld, A. Mäder, K. Tutschku, F.-U. Andersen, C. Kappler, H. de Meer, I. Dedinski, and J. Oberender. CrowdTesting: A Novel Methodology for Subjective User Studies and QoE Evaluation. Technical Report 486, University of Würzburg, Institute of Computer Science, Febuary 2013.

[12] A. Kittur, E. H. Chi, and B. Suh. Crowdsourcing user studies with mechanical turk. In *Proceedings of the SIGCHI conference on human factors in computing systems*, pages 453–456. ACM, 2008.

[13] W. Mason and D. J. Watts. Financial incentives and the performance of crowds. *ACM SigKDD Explorations Newsletter*, 11(2):100–108, 2010.

[14] J. A. Redi, T. Hoßfeld, P. Korshunov, F. Mazza, I. Povoa, and C. Keimel. Crowdsourcing-based multimedia subjective evaluations: a case study on image recognizability and aesthetic appeal. In *Proceedings of the 2nd ACM international workshop on Crowdsourcing for multimedia*, pages 29–34. ACM, 2013.

[15] H. Simula. The rise and fall of crowdsourcing? In *System Sciences (HICSS), 2013 46th Hawaii International Conference on*, pages 2783–2791. IEEE, 2013.