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Crowdsourcing not all sourced by the crowd: An observation on the behavior of Wikipedia participants



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ABSTRACT

This study investigates the behavioral patterns of Wikipedia participants to obtain a picture of internal dynamics of the world's largest crowdsourcing platform. It observes the responses of people when "other" people enter a crowd where internal and external controls are mostly absent. From the analysis of 342 Wikipedia articles, this study shows that the overall tone of Wikipedia articles is mostly decided by a *dominant few* rather than by a *trivial many*, and such domination worsens as the number of participant increases and the article matures. This result contradicts a common belief on crowdsourcing that Wikipedia would reflect the voices of a vast majority, obtain a balanced solution, and attain democracy on the Internet. Therefore, this study contributes to the literature by analyzing how effectively Wikipedia functions as a crowdsourcing platform within the context. It also implies that developing a proper crowdsourcing strategy such as effective management of a platform is necessary, especially when an organization has a specific goal to achieve throughout a project.

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1. Introduction

To understand the dynamics of a complex crowdsourcing platform, this study investigates the behavioral patterns of Wikipedia participants. We observe the responses of participants when "other" people enter a large crowdsourcing platform, Wikipedia, where internal and external controls are mostly absent. This observation would elucidate how the behaviors of crowdsourcing participants change as the crowd grows larger and subsequently provide insights into the internal mechanism of the complex crowdsourcing platform.

Nowadays, people are connected more than ever because of the Internet, which forces users to be part of an unexpected but fully functioning collaboration (Doan et al., 2011). For example, reCAPTCHA is a user-dialogue system that allows *Project Gutenberg* to digitize public domain materials, such as ancient books that cannot be read by optical character recognition (OCR) software (von Ahn et al., 2008). The system collects contributions from more than 100 million Internet users every day from websites such as Facebook, Twitter, and Craigslist.

Such strategic collaboration through the Internet has been conceptualized and developed into the term "crowdsourcing"

(Albors et al., 2008). Crowdsourcing does not simply refer to the gathering of resources from numerous people; rather, the concept emphasizes the synergic and value-added effects created by resources collected from the "crowd." Crowdsourcing differs from typical Internet-based collaboration in that the former emphasizes the value created from the "crowd" rather than from a "vital few" (Kittur, 2010).

As crowdsourcing phenomena continue to evolve in forms and functions, various types of crowdsourcing platforms emerge (Kohler, 2015). For example, one popular type of platform is tournament-style intermediaries for solution and idea crowdsourcing (Prpić et al., 2015a), such as Kaggle.com for predictive modeling projects, Threadless.com for product design, InnoCentive.com for research and development, and TopCoder.com for software development projects (Dissanayake et al., 2015). These platforms have established a large pool of self-selected participants, who are problem solvers rather than workers for hire. Organizations often commission crowdsourcing intermediaries as a paid platform service to acquire their own crowds (Prpić et al., 2015b).

As the crowdsourcing approach widely spreads, the dynamics inside a crowd is gaining attention from researchers and practitioners (Afuah and Tucci, 2012). When the number of participants of a crowdsourcing project increases, the intricacy of coordination among the participants also increases. The more openness crowdsourcing embeds, the more likely crowdsourcing be abused

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by people with malice or incompetence (Yasseri et al., 2014). Furthermore, crowdsourcing is concerned not only with ways to collect resources, but also with methods to create value through fair assessment and management of collected resources (Bona-beau, 2009). Therefore, crowdsourcing can be considered a double-edged sword that can either build knowledge or generate misinformation (Leimeister et al., 2009).

For these reasons, the current study investigates the basic behavioral patterns of crowdsourcing participants and selects Wikipedia as a crowdsourcing platform to explore. Wikipedia is selected because it is one of the largest crowdsourcing platforms with a notably low level of control and a high level of dynamics of people with pure motivation. While organizations actively utilize and attempt to control various crowdsourcing platforms such as Kaggle and Innocentive for their business interests and create their own proprietary crowds (Piezunka and Dahlander, 2015), people contribute to Wikipedia to achieve intrinsic motivation, such as seeking the truth, rather than extrinsic motivation, such as monetary incentives. Hence, Wikipedia, which is designed as an Internet-based control-free discussion agora, is suitable as a platform for testing the participating behaviors of crowdsourcing participants (Martinez and Walton, 2014). Observing the behavior of Wikipedia participants in various aspects will provide researchers and practitioners with an in-depth understanding of crowdsourcing at the principal motivation level.

This study is organized as follows. We first review the literature on crowdsourcing and Wikipedia as a crowdsourcing platform with low control. We then formulate three primary hypotheses on the behavioral pattern changes of Wikipedia participants as the crowdsourcing project matures. Next, we collect data from 342 Wikipedia articles and analyze the article creation and revision patterns to validate the hypotheses. Finally, we summarize our results and discuss implications.

2. Literature review

2.1. Crowdsourcing

Studies on crowdsourcing can be divided into three folds: exploratory papers such as conceptualizations and taxonomies, practice-based case studies, and theoretically applied studies. The first group focuses on basic features of crowdsourcing such as definition and taxonomy. Albers et al. (2008) overview the new types of network collaboration paradigms including motivation and consequences, from the various types of crowdsourcing. Doan et al. (2011) review how the practice of crowdsourcing transforms the Web to a new field of crowdsourcing. These studies use data-driven, practice-based approach that they examine the phenomenon first and then derive meaningful implication (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). More recently, Saxton et al. (2013) analyze 103 web-based crowdsourcing tools to provide taxonomy with nine base forms of crowdsourcing and Prpić et al. (2015b) define three general crowdsourcing techniques that are virtual labor markets, tournament crowdsourcing, and open collaboration, to examine and compare the different stages of the public policy developing cycles.

The second group mostly focuses on the various on-going, evolving practices of the crowdsourcing to discuss the immediate benefit and business potential of it. For example, Kittur (2010) highlights the potential of crowdsourcing in subjective tasks such as translation rather than the computational task. Gao et al. (2011) show the examples of the fast dissemination of critical information such as disaster relief through crowdsourcing using the case of the earthquake in Japan and Haiti. The study of Hyman (2013) focuses on the process of the crowdsourcing to emphasize the importance

of fairness using the example of Turkopticon. He emphasizes the power and concerns of observation using the concept of panopticon.

The third group studies on crowdsourcing use various theoretical frameworks to examine dynamics among the variables related with the crowdsourcing. For example, Brabham (2009) suggests crowdsourcing as an appropriate platform for enabling the citizen participation process in any public planning projects to achieve both creative solutions and democracy. The study of Leimeister (2009) identifies the motivations of crowdsourcing participants from incentive and activation perspectives. Huberman et al. (2009) analyze a massive data set from YouTube and show dependencies between productivity and attention. Afuah and Tucci (2012) discuss the necessity of crowdsourcing from characteristic, required knowledge, and solution perspectives. Poetz and Schreier (2012) verify that the performance of crowdsourcing is beneficial in terms of novelty and customer benefit.

2.2. Wikipedia: a crowd with anarchism

Wikipedia is one of the most popular crowdsourcing platforms with the least external constraints. Wikipedia allows everyone to participate, providing full authority to change entire contents without necessitating a central authority to assess the quality of the contents. Excelling in this freedom of content creation, Wikipedia manifested a potential to become one of the most influential encyclopedias, with 4.5 million articles in English compiled within a few years since 2001. Wikipedia has achieved its peak in 2007 (Simonite, 2013) and has become the most active storage of ideas and knowledge since then (Medelyan et al., 2009).

Numerous studies of Wikipedia focus on the knowledge sharing activities shaped by the generic openness of the participation and the given full control on the contents. For example, a group of studies is interested in the motivation, behavioral pattern of the participants. Yang and Lai (2010) argue that the most critical motivation for Wikipedia participation is not economic incentive but intrinsic self-motivation. Pfeil et al. (2006) examine a large scale Wikipedia contents to test cultural variables.

Another group of study focuses on a functionality aspect of the Wikipedia. Stvilia et al. (2008) emphasize the error correction function of Wiki that gathered participants not only detect errors in the contents but also correct them. Viegas et al. (2007) highlight the importance of group coordination, policy, and process of knowledge sharing in Wikipedia community. Kittur and Kraut (2010) also discuss the importance of regulation in Wikipedia saying that article quality can't improve without appropriate coordination techniques.

Macro level studies often identify the recent trends made by Wikipedia. For example, Kittur et al. (2007) describe the changing trend of the workload shifting from the "elite" to "common" users, to emphasize the sourcing process from the crowd. The study Yasseri et al. (2014) analyzes a number of editing patterns of users across languages and areas to interpret the site as a window into convergent and divergent social-spatial priorities, interests, and preferences, rather than as a plain online encyclopedia. These studies consistently discuss the potential of Wikipedia as a mature medium for crowdsourcing. People participating in Wikipedia do not behave by their economic incentives but by their beliefs. These Wikipedia circumstances support the appropriateness of Wikipedia for research on crowdsourcing and in observing the behavior of its participants.

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