Crowdsourcing Typology: A Review of IS Research and Organizations

Abhishek Tripathi  
*University of Nebraska at Omaha*, atripathi@unomaha.edu

Nargess Tahmasbi  
*University of Nebraska at Omaha*, narjestahmasbi@unomaha.edu

Deepak Khazanchi  
*University of Nebraska at Omaha*, khazanchi@unomaha.edu

Lotfollah Najjar  
*University of Nebraska at Omaha*, lnajjar@unomaha.edu

Follow this and additional works at: [http://aisel.aisnet.org/mwais2014](http://aisel.aisnet.org/mwais2014)

Recommended Citation

[http://aisel.aisnet.org/mwais2014/4](http://aisel.aisnet.org/mwais2014/4)

This material is brought to you by the Midwest (MWAIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in MWAIS 2014 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
ABSTRACT
A relatively new trend for organizations is to utilize the wisdom and labor of different people to solve problems with the help of web mediated technologies, popularly known as “Crowdsourcing”. Crowdsourcing is an act of outsourcing a task to large numbers of people in the form of an open call. While organizations are increasingly practicing crowdsourcing as a business model, there is much research that is yet to be done about crowdsourcing phenomenon. This paper aims to assess the current state of understanding of crowdsourcing within organizations and compare academic research with trend in practice. Using Howe’s (2008) typology of crowdsourcing, we categorize academic research and crowdsourcing organizations to understand which crowdsourcing type is prevalent in organizations and address the research gaps by academia. We conclude that while the academic research community has mostly focused on crowd creation and crowd wisdom, organizations are predominantly practicing crowd creation.

Keywords
Crowdsourcing, Co-Creation, Crowd Creation, Crowd Voting, Crowd Wisdom, Crowd Funding, Typology.

INTRODUCTION
Organizations are increasingly tapping the wisdom of crowds to solve their problems (Surowiecki, 2004; Howe, 2008). This phenomenon is called Crowdsourcing, a term coined by Howe (2006). Crowdsourcing is the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an “open call” (Howe, 2008). The common attributes of crowdsourcing are that it is a collaborative effort enabled by people centric technology. The core of crowdsourcing ideas originated from the notion that the wisdom of a crowd may be better than solutions created by specialists or small groups (Galton 1907; Surowiecki 2004).

The crowdsourcing business model can be applied to solve various types of problems. Some prominent examples include design (threadless.com, 99design), research and development (InnoCentive), knowledge accumulation for business (Amazon), and fund money for innovative ideas (IBM global entrepreneur). A crowdsourcing business model benefits organization by providing relatively cheap labor and by tapping geographically dispersed crowds.

Organizational practices and academic research are two important pillars for knowledge creation and dissemination of knowledge in society. Chaissen and Davidson (2005) argued that though organizations have an important influence on the pattern and meaning of IS activities, it has received little attention in the IS research. In the past, research has suggested that collaboration between the industry and academia is mutually beneficial for both (Perkmann & Walsh, 2007; Pavitt, 1991). The broader aim of this research is to explore the possible collaboration areas between universities and industries in “crowdsourcing typology” context.

Because of the great diversity in the problems being solved by crowdsourcing, various categorizations of crowdsourcing approaches have been proposed to classify crowdsourcing (Howe, 2006; Brabham, 2008; Geerts, 2009). Both organizations and academia have shown increased interests in the crowdsourcing phenomenon, but still it is difficult to understand the types of crowdsourcing that are prevalent in the organizations and academic research. In line with Chaissen and Davidson’s (2005) challenge, this research will help to understand which crowdsourcing type is prevalent in organizations and academic research.
TYPOLOGY OF CROWDSOURCING

A typology is a conceptual classification system which combines the greatest information content with the easiest way of information retrieval (Rich, 1992). Organizational typologies provide an effective way for data organization, information retrieval, and for development of theory (Rich, 1992). Existing crowdsourcing research has focused on specific crowdsourcing types and individual aspects, and thus fails to provide an integrated view of the overall crowdsourcing phenomenon.

Howe (2008) has described a typology of crowdsourcing, but that description is mostly based upon various examples. Table 1 presents a classification of crowdsourcing as suggested by Howe’s (2008) along with their characteristics, and some crowdsourcing organizational examples.

<table>
<thead>
<tr>
<th>Crowdsourcing type</th>
<th>Description</th>
</tr>
</thead>
</table>
| Co-Creation        | Engagement of customers for new product development.  
                     **Example:** Procter and Gamble formed a community to open innovation context to co-create with crowd. |
| Crowd Creation     | Engagement of crowds or organization to solve creative problems.  
                     **Example:** 99 design host public competitions for design problems and crowd participate for the end solutions |
| Crowd Voting       | Best artifacts are based on the voting of the crowds.  
                     **Example:** Ackuna controls the quality of translation by voting process |
| Crowd Wisdom       | The aggregated decision of crowd is used to make the decisions.  
                     **Example:** 7billionideas host to share everyday ideas to aggregate the ideas |
| Crowd Funding      | Crowd acts as a funding source for innovative and creative business ideas.  
                     **Example:** ActBlue hosts the funding for democratic party candidates of USA |

Table 1: Types of Crowdsourcing (Howe 2008)

RESEARCH METHOD

For this research, we surveyed a sample of 32 crowdsourcing organizations and cross referenced the survey with Howe’s (2008) crowdsourcing typology for crowdsourcing organization. For an understanding of the academic research in this domain, we reviewed the publications from top three IS conferences (Walstrom and Hardgrave 2001) and the top eleven IS journals (Clark et al. 2011). We also employed a foundational literature review, as prescribed by Webster and Watson (2002), to analyze the literature survey and to synthesize and categorize previous work to identify gaps, and predict possible future directions of the research (Webster & Watson, 2002).

The top eleven IS journal are – MISQ, ISR, JMIS, JAIS, EJIS, ISJ, JIT, JSIS, CAIS, I&M, and DSS (Clark et al. 2011). The review also included proceeding papers from three major IS conferences, namely the International Conference on Information Systems (ICIS), the Hawaii International Conference on System Sciences (HICSS), and the Americas Conference on Information Systems (AMCIS) (Walstrom and Hardgrave, 2001).

Because Howe first coined the term “crowdsourcing” in 2006, our literature search for this study ranges from January 2006 through 2013. A keyword search for “crowdsourcing” and “collective intelligence” over those same time periods was conducted. This initial search identified a list of 180 published articles to crowdsourcing. After an in-depth review of articles, we found that 54 articles were related to crowdsourcing types. Articles not selected either did not refer to crowdsourcing types, or only indirectly related to crowdsourcing. For example, an article titled “Vigilant interaction is knowledge collaboration: challenges of online user participation under ambivalence” was selected based upon our initial screening, but was then excluded based upon a more in-depth review. We also surveyed the sample of thirty two crowdsourcing
organizations. We have collected the sample from the crowdsourcing website www.crowdsourcing.org, which has the directory of about 2600 crowdsourcing organizations maintains by the crowd.

Information visualization is a useful approach to represent the information in a more meaningful and understandable manner. Graph visualization is one of these techniques that is useful when there’s a need to depict objects and their relationships with each other. For the visualization, we benefit from pre-implemented graph visualization techniques in Pajek, a powerful graph visualization tool which supports different graph layouts and algorithms.

ANALYSIS PROCEDURES

For a detailed analysis of the selected research articles, we first classified the articles based upon the definition of crowdsourcing types as defined by Howe (2008). The definition of crowdsourcing types is provided in Table 1. In the next step, thirty two organizations were coded based upon Howe’s (2008) crowdsourcing typology. These two codifications of research articles and organizations were used as the basis for the analysis-type of crowdsourcing strategy adopted by crowdsourcing organizations and academia. For the final step we used graph visualization. Figure 1 shows the crowdsourcing organizations and their associated crowdsourcing problems. The nodes in the organizations graph are color-coded based on the location of the organization. The colors assigned to each country are as follows: United Stated: Red, Argentina: Blue, Netherlands: Yellow, Switzerland: Orange, Germany: Purple, India: Cyan, United Kingdom: Orange Red, Africa: Ivory, all other countries: Red Violet. The organizations for which the location was unknown are white-colored.

The center node in this graph is labeled with Crowdsourcing which is connected to its sub-categories colored in black. The organization nodes are connected to the associated nodes based on their crowdsourcing type.

In the graph for academia research articles (figure 2), the nodes are colored based on the type of crowdsourcing they address. The color codes are as bellow: Crowd-Funding: Red, Crowd-Creation: Blue, Co-Creation: Green, Crowd-Voting: Yellow, Crowd-Wisdom: Brown. The nodes with more than one crowdsourcing type associated with are white-colored.

OUTCOME AND DISCUSSION

By looking at the emergent characteristics, principles and behaviors employed by crowdsourcing researchers and organizations within the context of the typology of crowdsourcing, the following observations were derived.

The results suggest that crowdsourcing to leverage the aggregation of knowledge (mostly ideas) provided by the crowd and solving organizational problems are common crowdsourcing types explored by IS researchers. Crowd wisdom is mostly used for “ideas” competition, which evaluate ideas to get a better understanding of problems and solutions for a continuum of fields, ranging from citizen science (Schuurman et al., 2002; Nam, 2012;) to software development (Leimieste et al., 2009). The crowd creation approach has been used to solve various problems such as photo tagging (Zhai, 2012), inclusion of public to solve various research problems for citizen science (Wiggins, 2012), or contests to solve various problems (Archak, 2009), etc. Crowd creation and crowd funding were the most common business models for crowdsourcing organizations. Crowd voting has received the least attention by organizations. Organizations are also using crowdsourcing to solve problems such as research and development problems (Innocentive), software development (topcoder), t-shirt design (threadless), and for idea generation (Amazon, 7billionideas, etc.).

The next most supported crowdsourcing type by both academic research community as well as organizations is co-creation. Organizations have begun to capture potential customers’ collective intelligence by establishing brainstorming tools (Chen, 2012). Some video game industries have let the consumers to develop a “consumer-derived and consumer-implemented derivative products” (Arazaki, 2007).
Figure 1: Categorization of organizations based on crowdsourcing types
Figure 2: Categorization of academic research based on crowdsourcing types

The finding from this research suggests that United States has the most number of organizations in every category of Crowdsourcing. This finding needs further investigation as why other countries have not harnessed the crowdsourcing phenomenon and how this division can be addressed.

CONCLUSIONS

In essence, this paper has attempted to explore which crowdsourcing types are harnessed by crowdsourcing organizations and academic IS research. Combining organizations and crowdsourcing literature revealed important information regarding the types of crowdsourcing practiced and researched, and the types of potential problems crowdsourced by organizations. Research finding suggests that the academic research community has mostly focused on crowd creation and crowd wisdom, while organizations are predominantly practicing crowd creation. Organizations and academia may start collaboration in the crowd funding and crowd voting type of crowdsourcing as these two types of crowdsourcing have received least attention by organizations and academic research community.
This study is limited through the use of literature survey and a sample of thirty two organizations to assess the current state of understanding of crowdsourcing within organizations and propose some directions for academic research. First, published literatures provides limited information; therefore, the analysis is constrained by the results published by the authors. Second, even though research supports the use of top eleven IS journals, top three IS conferences, and sample of thirty two organizations, we are aware that this may lead to biases; that is why our future efforts will be looking into an expanded base of literature and organizations.

REFERENCES


