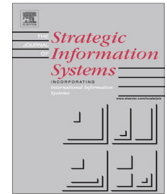




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Viewpoint

Towards an information systems perspective and research agenda on crowdsourcing for innovation

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ABSTRACT

Recent years have seen an increasing emphasis on open innovation by firms to keep pace with the growing intricacy of products and services and the ever changing needs of the markets. Much has been written about open innovation and its manifestation in the form of crowdsourcing. Unfortunately, most management research has taken the information system (IS) as a given. In this essay we contend that IS is not just an enabler but rather can be a shaper that optimizes open innovation in general and crowdsourcing in particular. This essay is intended to frame crowdsourcing for innovation in a manner that makes more apparent the issues that require research from an IS perspective. In doing so, we delineate the contributions that the IS field can make to the field of crowdsourcing.

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1. Introduction

In order to continually innovate, firms are opening their boundaries to engage external expertise (Boudreau, 2010; Boudreau et al., 2011; Chesbrough, 2003; Enkel et al., 2009; Surowiecki, 2004). Instead of simply collaborating with a select few known external parties, firms are increasingly innovating using “crowdsourcing”. Crowdsourcing is the act of taking a challenge faced by a firm and, instead of asking internal research and development departments to solve the challenge, the firm broadcasts an open call to individuals with relevant expertise outside the firm to become involved in solving the challenge (Howe, 2006). Sometimes participants in crowdsourcing are limited to specifically selected communities (e.g., Genius Crowds, and Innocentive); other times, the general public is invited.

Information systems play a huge role in making crowdsourcing possible by providing the network and software for sharing ideas (Andriole, 2010; Awazu et al., 2009; Bingham and Spradlin, 2012; Doan et al., 2011; Dodgson et al., 2006; Lindic et al., 2011; Trott and Hartmann, 2009; Williams, 2012). However, information systems (IS) scholarship has only minimally engaged with crowdsourcing or the broader phenomenon of open innovation (Diener and Piller, 2009; Ebner et al., 2009). Systematic research by IS scholars on the design of the software, user interface, and practices to facilitate the crowdsourcing process is scarce (Leimeister et al., 2009 and Feller et al., 2012 are exceptions). This essay is intended to help overcome this dearth. In the tradition of Strategic Information Systems (Gable, 2010), this paper establishes the strategic use of IS in the context of open innovation. Our focus is not on the short term use of IS platforms to satisfy the current needs of the crowdsourcing trend. Rather, we are interested in establishing a theory of the design of IS platforms that can be strategically leveraged over the long term to maximize the potential of open innovation, i.e., to create a generative capacity for the firms through the strategic design and use

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of IS (Avital and Te'eni, 2009). In keeping with the ideas put forth in the 20th anniversary special issue of this journal, we focus on behavioral issues related to IT in high velocity environments (Galliers et al., 2012). Our focus is on establishing the dynamics of the use of social software for extra-organizational knowledge management (von Krogh, 2012).

We first define crowdsourcing for innovation, Next, we highlight the variations in “participation architectures” (West and O'mahony, 2008), recognizing that IS design has been a “neglected” critical component of research on participation architectures. From this examination, we are able to identify the gap that IS research can fill: improving the participation architectures for crowdsourcing. We then propose a set of affordances for the design of crowdsourcing platforms that could fill this gap, and the future research questions that these affordances offer the field.

2. Crowdsourcing for innovation

Dating as far back as 1714 when the British government cast an open call for solutions determining precise longitude coordinates for navigation purposes, crowdsourcing for innovation has been used to obtain ideas, technologies, and even entire businesses from outside the organization (Afuah and Tucci, 2012). While crowdsourcing for innovation in itself is not a new concept, the move towards open innovation (Chesbrough, 2003; Rheingold, 2003) and innovation as a strategic competitive advantage for the firm (Terwiesch and Xu, 2008) has accelerated its focus by academics (e.g., Chesbrough et al., 2008; Dahlander and Gann, 2010; West and Bogers, 2013).

Crowdsourcing is defined as: “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 [i.e., announcement], the voluntary undertaking of a task.” (Estellés-Arolas and Gonzalez-Ladron-de-Guerva, 2012, p. 9) Crowdsourcing for innovation is one type of task to which crowdsourcing is applied (Erickson et al., 2012). We define innovation in a crowdsourcing context as the public generation of innovative solutions to a complex problem posed by the company sponsoring the challenge call. Innovative solutions are those that are novel and implementable for the sponsoring organization (Amabile, 1988). Innovative solutions may include new sources of revenue such as new product lines or new services, or changes to existing processes and practices (Dahlander and Gann, 2010). For example, Heineken's 2012 crowdsourcing challenge yielded a new design for a beer bottle to create a new image for the customer experience of consuming beer. Similarly, General Electric's Sustainability Challenge led to the acquisition of a company with a new business model for sustainability.

The theoretical basis for crowdsourcing being generative of innovation is the value of expertise diversity. External crowds are more diverse in expertise and experiences than internal research and development units, and, with expertise diversity, comes the possibility of a greater quantity and variety of ideas, ideally resulting in more innovative ideas (Bingham and Spradlin, 2012; Dahan and Mendelson, 2001; Terwiesch and Ulrich, 2009). Taking advantage of a theorem referred to as “diversity trumps ability”, a number of studies have demonstrated that a large diverse crowd of independent strangers performs better on certain types of challenges than a small number of experts (Brabham, 2013). This theorem has been demonstrated across a wide range of fields including computing, science, sports forecasting, stock forecasting, and world events (e.g., Buecheler et al., 2010). Diverse expertise may be derived from differences in knowledge domains, contexts, product usage, discipline or specialty work areas (Erickson et al., 2012; Schenk and Guittard, 2011). Variability in the source of diversity extends beyond the von Hippel (1986) notion of ideas coming from lead users to include ideas coming from all members of a company's value constellation – suppliers, competitors, customers, service delivery channels, and content providers (Lee et al., 2010; Normann and Ramirez, 1993; Vanhaverbeke and Cloudt, 2006). The greater the size of the crowd, the greater the possibility of idea diversity put forth by the crowd (Boudreau, 2012). With greater variety in the ideas and comments, the greater the probability that ideas will be more highly valued as novel and implementable by challenge sponsors (Poetz and Schreier, 2012), and that novel approaches not previously considered by the “internal” experts will be generated (Boudreau, 2012; Boudreau et al., 2011; Jeppesen and Lakhani, 2010).

3. Participation architectures for innovation crowdsourcing

Participation architectures refer to sociotechnical systems design elements that encourage and integrate contributions made by participants to an open online forum focused on developing innovative solutions, such as open source software or Wikipedia (O'Reilly, 2005; Wagner and Majchrzak, 2007; West and O'mahony, 2008). Several distinct design dimensions of participation architectures have been identified, two of which we focus on: (1) production (the way the community conducts its production process) and (2) co-creation boundary management (the process by which, through incentives and intellectual property rights management, only certain individuals will be encouraged to participate (West and O'mahony, 2008). Below we describe the variations in participation architectures along these two dimensions that have been studied to date in the literature.

3.1. Production

The process of production in crowdsourcing involves participants making contributions to a crowdsourcing web-based platform that specifies the crowdsourcing “call” and instructions on how to post contributions. Crowdsourcing-for-innovation challenges may range from calls for incremental innovation such as improvements in existing product lines (Mattel and

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