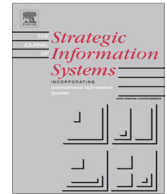




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Solvers' participation in crowdsourcing platforms: Examining the impacts of trust, and benefit and cost factors

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ABSTRACT

Organizations are increasingly crowdsourcing their tasks to unknown individual workers, i.e., solvers. Solvers' participation is critical to the success of crowdsourcing activities. However, challenges exist in attracting solvers to participate in crowdsourcing. In this regard, prior research has mainly investigated the influences of benefit factors on solvers' intention to participate in crowdsourcing. Thus, there is a lack of understanding of the cost factors that influence actual participation behavior, in conjunction with the benefits. Additionally, the role of trust in the cost-benefit analysis remains to be explored. Motivated thus, based on social exchange theory and context-related literature, we develop a model to explain the impacts of benefit and cost factors as well as trust on solver participation behavior in crowdsourcing. The model was tested using survey and archival data from 156 solvers on a large crowdsourcing platform. As hypothesized, monetary reward, skill enhancement, work autonomy, enjoyment, and trust were found to positively affect solvers' participation in crowdsourcing, while cognitive effort negatively affects their participation. In addition, it was found that monetary reward positively affects trust (trust partially mediates its effect on participation behavior), while loss of knowledge power negatively affects trust. The theoretical contributions and practical implications of the study are discussed.

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Introduction

The large-scale interconnectivity afforded through Internet-based technologies has transformed how organizational tasks are being performed (Deng et al., 2016; Geri et al., 2017). Firms are increasingly leveraging the wisdom of crowds to perform a variety of tasks, e.g., to obtain market feedback about products, undertake tedious work, and collect novel ideas (Piezunka and Dahlander, 2015; Ye and Kankanhalli, 2015). This phenomenon of crowdsourcing is defined as the act of recruiting a large group of undefined individuals, i.e., solvers, to undertake organizational tasks through Internet-based platforms (Howe, 2008). Strategically, crowdsourcing is considered as an important opportunity by businesses to gain external expertise and lower their costs (Kietzmann, 2017). With innovation and talent management being major strategic priorities for CEOs (KPMG, 2016), crowdsourcing serves as a way to foster organizational innovation through tapping external solvers' knowledge and creativity (Majchrzak and Malhotra, 2013).

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Indeed, participation of solvers is critical to the viability and success of crowdsourcing (Afuah and Tucci, 2012; Boons et al., 2015). However, challenges exist in sustaining solver participation in crowdsourcing (Boons et al., 2015; Greengard, 2011), such as the difficulty of motivating solver participation with appropriate incentives (Majchrzak and Malhotra, 2013). With varied incentives being proposed (Geri et al., 2017; Kaufman et al., 2011), monetary reward alone may not be sufficient to motivate solvers to participate (Feller et al., 2012; Zheng et al., 2011). Further, the costs incurred during crowdsourcing need to be identified and addressed. Without knowledge of the antecedents of solvers' participation, the performance of crowdsourcing may be undermined (Afuah and Tucci, 2012; Boons et al., 2015). Thus, it is important for firms and crowdsourcing platforms to understand what motivates and inhibits solvers from participating in crowdsourcing.

To date, a few studies have examined solvers' participation in crowdsourcing conceptually (e.g., Terwiesch and Xu, 2008) and empirically (e.g., Boons et al., 2015; Deng et al., 2016; Zheng et al., 2011). However, prior research has mainly focused on the influences of expected benefits (extrinsic or intrinsic motivations) on solvers' *intention* to participate in crowdsourcing. There is a need for theoretically-driven empirical research which investigates the influence of benefit factors on solvers' *actual* participation in crowdsourcing, as there could be a gap between intention and actual behavior (Sheeran and Webb, 2016). Furthermore, it has been suggested that participation in crowdsourcing may incur costs in terms of spending time and effort to understand the problems and propose solutions (Afuah and Tucci, 2012). Such costs can hinder solvers' participation in crowdsourcing, especially in the context of financially rewarded competition-based crowdsourcing (Ye and Kankanhalli, 2013). Yet there is a lack of research that identifies and empirically examines the influence of cost factors on solvers' *actual* participation in crowdsourcing.

Additionally, solvers may encounter risks such as firms' opportunistic behaviors (e.g., rejecting their solutions to tasks and not paying them) and their ideas being revealed to peers (other solvers) (Afuah and Tucci, 2012; Feller et al., 2012). Such risks heighten the importance of trust during solvers' participation. Previous research suggests that in online environments, trust can encourage participation (Jarvenpaa et al., forthcoming; Kim, 2014) and may mediate the relationship between environmental conditions and future participation (e.g., Porter and Donthu, 2008). However, there is a lack of research that explains the direct and mediating impacts of trust on solvers' participation in crowdsourcing. Thus, combined together, there is a need to examine the influences of costs and benefits on solvers' participation in crowdsourcing in conjunction with the effects of trust.

Motivated by these knowledge gaps, this study aims to answer the research questions: (1) How do trust, cost, and benefit factors affect solvers' participation in crowdsourcing? and (2) Does trust mediate the effects of certain benefit and cost factors on solvers' participation? Considering the plurality of crowdsourcing types, we focus on the common approach of financially rewarded competition-based crowdsourcing instead of voluntary collaboration-based crowdsourcing, which may be mainly intrinsically motivated (Boons et al., 2015; Ye and Kankanhalli, 2013). Based on social exchange theory (Blau, 1964) and context-related literature, we develop a model to explain solvers' participation in crowdsourcing in terms of perceived costs, benefits, and trust in the crowdsourcing platform. The model is tested with survey and archival data from 156 solvers in a large crowdsourcing platform and found to be largely supported.

This study contributes to the crowdsourcing literature by examining solvers' actual participation behavior in crowdsourcing, modeling and testing the influences of cost concerns in addition to benefits on solver participation, and exploring the role of trust in this context. It also provides insights to practitioners for attracting and sustaining solvers' participation in crowdsourcing platforms.

Conceptual background

We first review existing empirical studies and theories that explain solvers' intention to participate in crowdsourcing. From the review, we identify the research gap this study seeks to address. We then describe our theoretical foundation, social exchange theory, and justify why we use it in this study. While social exchange theory provides the overarching logic for our model, we make use of other relevant literature for more specific theorizing of the constructs in our study context. We subsequently review this literature to identify relevant benefit and cost factors for solvers' participation. Last, we build on previous literature on trust in technology to identify antecedents and effects of trust in the context of crowdsourcing participation.

Review of studies on solvers' crowdsourcing participation intention

Through our literature review, we identified several theories i.e., value theory, value expectancy theory, motivation theory, social identity theory, and value sensitive design theory, that have been applied to explain solvers' participation intention or continuance in crowdsourcing (see Table 1). Deriving from value theory, Sun et al. (2011) conducted a survey in TaskCN, a Chinese crowdsourcing website and found that hedonic value (enjoyment) enhances solvers' continuance intention. This relationship was partially mediated by satisfaction with the process of crowdsourcing. Following the previous study, Sun et al. (2012) developed a model for solvers' continuance intention based on value expectancy theory. Their survey study of solvers from TaskCN reported that both extrinsic (monetary reward) and intrinsic (enjoyment) motivations enhance solvers' intention to continue participating in crowdsourcing. In a similar vein, Zheng et al. (2011) used motivation theory and found that both intrinsic motivation (enjoyment) and the extrinsic motivation to gain recognition enhance solvers'

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