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Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Motivations, challenges, and opportunities of successful solvers on an innovation intermediary platform

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ARTICLE INFO

Keywords:

Challenges for solvers
Innovation contest
Innovation intermediary
Open innovation
Opportunities for solvers
Solvers' motivation

ABSTRACT

The study aims to identify motivations, challenges, and opportunities of successful solvers participating in virtual teams of innovation contests (ICs) organized by an innovation intermediary. Based on 82 interviews of successful solvers, it provides novel insights into ICs. The main motivational factors of successful solvers engaged in problem solving are money, learning, fun, sense of achievement, passion, and networking. Major challenges solvers face include unclear or insufficient problem description, lack of option for communication, language barrier, time zone differences, difficulties in finding suitable team members, framing the results, and difficulties in becoming quick learners and team players. Despite challenges, solvers have many opportunities, such as diversified knowledge, learning culture, developing a different way of thinking, gaining insights from other experts, the ability to work in a diverse environment, options of work after retirement and from distant locations, and a new source of income.

1. Introduction

Firms are increasingly striving to find solutions from external sources of the problems that perhaps their internal people are unable to solve (Boudreau et al., 2011; Dodgson et al., 2006; Huston and Sakkab, 2006; Tran et al., 2011). A well-established channel with external parties helps to gain superior firms' performance (Wang et al., 2015). Intermediaries play a crucial role to find solution from external sources for the solution-seeking organizations (Hossain, 2012). They organize innovation contests (ICs) to tap external resources (Dushnitsky and Kluetter, 2011). IC is defined as an internet-based competition organized by calling mass people or specialized target groups who submit a solution individually or as a team for a specific problem within a pre-defined time-period (Adamczyk et al., 2012; Bullinger et al., 2010; Garavelli et al., 2013; Schuhmacher and Kueter, 2012).

Solution seeking organizations can broadly take two approaches to engage external solvers (see Garavelli et al., 2013; Hallerstedte, 2013; Hossain and Simula, 2017). They can create and manage their own platforms or use intermediaries who can organize ICs on their platforms to find solutions from external experts. Large firms, such as Cisco, Dell, IBM, Procter & Gamble, and Starbucks are using their own platforms to tap external experts (see Billington and Davidson, 2013; Gassmann et al., 2010; Hossain and Islam, 2015; Jouret, 2009). Moreover, intermediaries such as IdeaConnection, InnoCentive, and NineSigma organize online ICs for solution seekers to find solutions from potential solvers (Hossain, 2012). They are considered as a complement to

internal innovation activities of large organizations (Lichtenthaler, 2013). Intermediaries have specialized knowledge on conducting ICs and ability to aggregate a wide pool of knowledge owners. They provide support services that enable solution seekers to connect and collaborate with external solvers. Seekers may not recognize the value of a solution received through intermediaries, as the solutions may be distant from the seekers requirement. Moreover, intermediaries may not provide competitive advantages as other competitors use the same platforms (Garavelli et al., 2013).

A number of issues, such as solvers' motivation, reward type, complexity of the problem, etc. play crucial roles for the successful IC. Solvers' motivation is external to the seeking organizations as such organizations have limited control on it. Motivation is a key for successful IC. Hence, understanding the underlying motivations of solvers is crucial (Jeppesen and Frederiksen, 2006). However, despite high motivation, solvers may not contribute properly if they face challenges that are beyond their control, for example, unclear problem statement and limited options to get feedback during an IC (Hallerstedte, 2013). Moreover, solvers want to perceive noticeable values before engaging in an IC.

Most studies consider the perspective of solution seekers, whereas the perspective of solvers is limitedly known (Yang et al., 2010). Some studies have revealed different phases of ICs to understand how these phases support the potential ideas (Kokshagina et al., 2016). Few studies have identified various motivational factors of solvers based mainly on the online survey (see Antikainen and Vaataja, 2010;

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<http://dx.doi.org/10.1016/j.techfore.2017.10.018>

Received 12 October 2016; Received in revised form 10 September 2017; Accepted 23 October 2017
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Jeppesen and Frederiksen, 2006; Wendelken et al., 2014). Solvers face numerous challenges while solving problems on platforms. Nevertheless, solvers get numerous opportunities engaging in innovation platforms (Hossain, 2012). The extant literature possesses limited knowledge of the motivations, challenges, and opportunities that are associated with solvers (Jeppesen and Lakhani, 2010) especially in the context of the virtual team (Frey et al., 2011). Most of the studies have explored innovation platforms where solvers work independently – not in a team. Studies on OIPs, where solvers work in a virtual team, are highly sparse. The objective of this study is to identify motivations, challenges, and opportunities of successful solvers participating in virtual teams of IC organized by an intermediary. To accomplish the objective, we answer the following questions: (1) what are the main motivations of solvers to participate as a team member of virtual innovation contests? (2) what are challenges solvers face while working in virtual innovation contests? and (3) what are the benefits for solvers participating in virtual innovation contests?

The remainder of this paper is structured as follows. A review of relevant literature is presented in the next section. In section three, research methodology and data collection process are described in detail. Section four includes analysis and results. The final section provides implications of this study along with future research avenues.

2. Prior research

2.1. Innovation platform and innovation contest

Traditionally, firms conduct innovation activities within their boundaries or in close collaboration with certain external organizations (Chesbrough, 2006; Enkel et al., 2009). An alternative way of innovation is to engage external individuals for innovation, such as inviting anyone to submit a solution against an open call through online platforms. Collaboration with innovation intermediaries has become an integral part of many firms. Even though innovation intermediaries are increasingly being used in practice, there is limited understanding on their operational mechanism and value for innovation (Winch and Courtney, 2007). Moreover, Martinez-Torres and Olmedilla (2016) point out that the characteristics of solvers are crucial to identify and engage the most innovative solvers.

Innovation contests are organized by firms, state organizations, non-profit organizations, individuals, and intermediaries (Bjelland and Wood, 2008; Ebner et al., 2009; Hossain and Kauranen, 2014). An IC call mainly includes textual descriptions, sketches, and prototype of the seeking problem (Klein and Lechner, 2009). IC has been studied from various lenses, and it is explored under several research domains, such as open innovation, crowdsourcing, innovation communities, online communities, distributed search, user innovation, co-creation, and collective intelligence (Boudreau et al., 2011; Poetz and Schreier, 2012).

The role solvers is essential for IC (Chu, 2013). In some ICs, solvers can submit solutions individually, whereas in other contests, working in a virtual team is imperative (Hossain, 2012). A team of several solvers working on a particular problem may bring out a better solution than an individual's effort. One weakness of IC is that it might generate similar or a redundancy of solutions simultaneously (Girotra et al., 2010). However, Kornish and Ulrich (2011) point out that even though a redundancy of solutions maybe generated in a parallel effort, this redundancy is insignificant even in a narrowly defined area. Innovation contest on virtual platforms is a relatively new phenomenon and seekers are increasingly using ICs to find ideas outside their organizations' boundaries so it is important for managers to learn governance regimes and how it works in various contexts (Felin and Zenger, 2014; Lakhani et al., 2013). IC is an uncertain approach, and a more complex problem entails higher uncertainty (Boudreau et al., 2011). Moreover, the high complexity of a problem requires various approaches for solving that problem (Boudreau et al., 2011; Jeppesen and Lakhani, 2010). Solvers'

motivation is a key in solving innovation through innovation contests.

2.2. Motivation of solvers

The incentive structure needs to be attractive for solvers and appropriate for the seekers (Ebner et al., 2009). Seekers need to formulate ICs properly to motivate solvers (Zheng et al., 2011). Previous studies found that the motivation of solvers is highly heterogeneous, encompassing both extrinsic and intrinsic categories (Boudreau and Lakhani, 2009; Frey et al., 2011). Moreover, extrinsic rewards reduce the positive impact of intrinsic motivation (Schuhmacher and Kuester, 2012). Major intrinsic motivations of solvers include altruism, communication, enjoyment, feedback to community, fun, networking, and personal need for innovations (Bjelland and Wood, 2008; Boudreau and Lakhani, 2009; Bullinger et al., 2010; Frey et al., 2011; Fuller et al., 2006; Jeppesen and Frederiksen, 2006; Natalicchio et al., 2014; Schuhmacher and Kuester, 2012; Wendelken et al., 2014; Zheng et al., 2011). The main extrinsic motivation of solvers include career opportunities, free products and services, rewards, recognition, attention from others, career mobility, promotion, share of intellectual properties, social capital, and user value (Boudreau and Lakhani, 2009; Fleming and Waguespack, 2007; Frey et al., 2011; Natalicchio et al., 2014).

Girotra et al. (2010) find that groups organized in the hybrid structure of payment are able to generate better outcomes from a contest. Solvers need to invest significant time and effort to win a contest (Ebner et al., 2009). They are unlike internal employees as such they cannot be forced to participate or compel to pay attention to activities of other solvers when necessary (Fleming and Waguespack, 2007). In most of the ICs, only the winner gets the reward – winner-takes-all (Adamczyk et al., 2012). Some scholars argue that seekers can provide both awards and subsidies to the solvers for motivations (Natalicchio et al., 2014).

Intermediaries mainly use the monetary reward to motivate solvers (Antikainen and Vaataja, 2010). In some cases, however, studies found that high monetary rewards might have an adverse effect on the outcome of the IC (Ariely et al., 2009; Bénabou and Tirole, 2006). Intermediaries mostly use a fixed-price reward structure, which may result in the low inducement. Hence, Terwiesch and Xu (2008) argue that a performance-contingent reward structure might mitigate the problem of solvers' underinvestment. Studies on IC explored motivations of solvers who submit solutions individually, whereas how solvers work in a virtual team to solve problems is limitedly known.

2.3. Challenges in innovation contests

A detailed description, clear elaboration, and well-defined problem formulation are prerequisite for successful problem solving (Boudreau et al., 2011; Garavelli et al., 2013). Designing an IC involves various activities, tough decisions, careful planning and support from managers (Hossain and Kauranen, 2014; Leung et al., 2014; Piezunka and Dahlander, 2015). Managers are often reluctant to engage in ICs for the not-invented-here syndrome (Arora and Gambardella, 2010; Natalicchio et al., 2014). To integrate external knowledge firms need to make external parties integrated insider (Dingler and Enkel, 2016). A challenge in ICs is the willingness and capacity of managers to absorb and exploit external knowledge (Denicolai et al., 2016). Organization culture and structure shape the effectiveness and efficiency of problem solving (see von Hippel and von Krogh, 2016). Spradlin (2012) argues that solution-seeking organizations have several major concerns to embrace ICs: which problem should firms engage, what information and language is included in a problem statement, what solvers need to submit, what incentives should be offered to solvers, and how solutions are evaluated and measured.

Problem formulations often are defective because they may not contain all relevant problem-specific and contextual information (von Hippel and von Krogh, 2016). Formulating problems in words needs

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