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Tapping the innovative business potential of innovation contests

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Abstract   Innovation contests are increasingly used by businesses to identify new ideas for better servicing their customers; yet, the degree to which the innovation contests provide new ideas has been disappointing. We describe the case of a large innovation contest via which we examined the role of three elements of the online discussion context to predict whether innovative ideas are generated during the contest. The three elements are: (1) the discussion thread's amount of variety (i.e., variation of participants' familiarity with the topic or organizational background), (2) the amount of collaborative versus argumentative posts that have been made in the discussion prior to a contributor's innovative post, and (3) whether the discussion includes previous posts from the participant prior to the innovative post. We found three ideal profiles for a person generating innovative ideas: (1) he or she posts after participants who have substantial variation in familiarity with the topic, (2) he/she posts on discussion threads in which participants focus their contributions on adding their own perspectives, not on arguing with others, and (3) he/she has not previously posted. These findings lead to specific implications for managing innovation contests.
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1. Innovation contest

An innovation contest is an approach used by firms that encourages a public crowd to co-creatively develop innovative responses to a firm's question (Füller, Hutter, Hautz, & Matzler, 2014; Hutter, Hautz, Füller, Mueller, & Matzler, 2011). The question prompt is often quite open, such as asking the crowd to offer recommendations for new business models, new sources of revenue, or new strategic priorities (Majchrzak & Malhotra, 2013). Innovation contests—or open innovation challenges—are derived from the open innovation paradigm, which "assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology" (Chesbrough, 2006, p. 1).

Innovation contests use what are referred to as 'Web-based crowdsourcing platforms' in which a firm's question is outsourced to an undefined group

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of participants (Estellés-Arolas & González-Ladrón-de-Guevara, 2012; Howe, 2006). Predictions are that by 2017, crowdsourcing will be used by more than 60% of firms as a way of engaging external parties in making a wide variety of decisions with a wide variety of providers (McIntyre, Reynolds, McGuire, & Milanesi, 2013). Innovation contests ask the public to not only contribute ideas, but also collaborate with each other online to co-create innovative answers to the question prompt. Because of dissatisfaction with the incremental nature of the ideas suggested from traditional crowdsourcing, many firms increasingly use the extension offered by innovation contests (Majchrzak & Malhotra, 2013; West & Bogers, 2014).

This article explores how to tap the potential of innovation contests by improving discussion variety, encouraging participants to add their own perspectives, and cheering on first-time posters. Methods, techniques, and tools exist to foster creativity in non-online groups (e.g., de Bono, 1985). For example, de Bono's theory is based on the fact that the human brain thinks in distinct ways—managing, information, emotions, discernment, optimistic response, and creativity—which can be challenged. De Bono's (1985) six thinking hats process, represented with hats of different colors, seeks to introduce parallel thinking after an objective is defined using the blue hat, which avoids adversarial confrontations by participants wearing different hats. A clear analogy can be drawn to the case of innovation contests since the organization defines the problem (blue hat) and participants can contribute by adding their perspectives. In convergence with de Bono's six thinking hats, this article's guidelines maximize the amount of different perspectives in a discussion that leads to the posting of more innovative ideas.

Guidelines for managing crowdsourcing include designing the innovation contests' Web platforms, using non-technical language, defining objectives, clarifying terms and conditions for participants, clearly communicating the idea selection process, finding internal champions to implement crowd ideas, and properly aligning rewards with motivations (Alexy, Criscuolo, & Salter, 2012; Boudreau & Lakhani, 2012; West, 2009). Participants in innovation contests are not only motivated by winning the announced prize but also by a range of other factors, such as learning and social support (Hutter et al., 2011). These guidelines are important for establishing an environment that encourages participation. However, they generally ignore the person's context of the online discussion: the possibility that the manner in which participants behave during the innovation contest may affect whether they offer innovative recommendations or contribute to other participants offering innovative recommendations.

Thus, previous research has treated the process of the contest as a 'black box.' A first step in understanding this black box is to characterize elements of the online discussion context that may affect a person's propensity to post an innovative idea.

In the innovation literature, the online context is a key factor affecting the innovativeness of the contributions (Füller et al., 2014; Hutter et al., 2011; Majchrzak & Malhotra, 2013). We use three different elements to characterize a person's online context prior to his/her innovative post: (1) the amount of variety among those contributing to the discussion, (2) the amount of collaborative versus argumentative posts, and (3) whether the discussion includes previous posts from the person. In this article, we describe recent research and use a quantitative analysis of a case study of an innovation contest to develop guidelines specifically directed at understanding these three elements.

2. Background on the case of an innovation contest

The United States Agency for International Development (USAID) is a U.S. federal agency tasked with providing funding and expertise to end extreme global poverty and enable resilient, democratic societies to realize their potential. Typically, USAID develops 5-year strategic missions based on internal management discussions. In this case, for the first time, USAID asked citizens in developing countries with past USAID presence for their views on which grand challenges USAID should address in its forthcoming 5-year strategic plan. The USAID case is an Innovation Jam (Bjelland & Wood, 2008). Similar to an innovation contest but without prizes (Bjelland & Wood, 2008; Hutter et al., 2011), jams encourage collaboration-based crowdsourcing (Afuah & Tucci, 2012). The USAID Grand Challenges innovation contest was announced using current and past USAID mission staff and the extensive contact network USAID had established around the world through social media channels, distribution of flyers, videos, pictures, and blog messages. To expose as many people as possible from around the world to the upcoming innovation contest, USAID asked other organizations to announce it, including non-government organizations, embassies, government agencies in countries in which it had missions, and educational institutions with an interest in global development. Figure 1 shows the front website for the contest. The contest ran for 72 hours, during which 254 individuals from 49 countries participated, generating 591 posts. Example posts, categorized by participation level, are shown in Table 1.

Figure 1. Sustainable innovation contest from Global Pulse 2010

To assess the innovativeness of a post, we used criteria developed by USAID. After completion of the contest, a jury of staff members in the strategy unit at USAID read the 591 posts to see what they could glean from the tenor and nature of the posts; however, they did not engage in any systematic coding or analysis of the posts. The posts stimulated the staff members to develop what they referred to as four innovative (i.e., not previously tried by USAID) strategic thrusts (USAID, 2010). The thrusts are listed and defined in Table 2.

To determine whether an individual post was innovative, we followed a procedure by Lamastra (2009) in which the USAID jury's list of innovative strategic thrusts (USAID, 2010) was used to train two research assistants about the content considered by USAID to be innovative. The two assistants then read each of the 591 posts to assess whether the content in a post replicated the content in the USAID list of innovative strategic thrusts. To begin, they independently read and coded 10 posts, then met to agree on their coding. After coming to a consensus, they independently read and coded the next 200 posts before meeting again to discuss and resolve differences. Finally, they independently read and coded the remaining 380 posts and followed with another discussion to resolve differences. A Kappa inter-rater reliability coefficient was calculated for the pre-discussion codes and found to have a moderate agreement (Rietveld & van Hout, 1993). This rigorous procedure resulted in a subsample of 64 innovative posts (i.e., posting matching an innovative strategic thrust) and 527 posts that were not innovative. Examples of posts matching an innovative strategic thrust are shown in the third column of Table 2.

3. Elements of online discussion contexts

The innovation literature has equivocally represented the effect of three elements of online discussion contexts relating to innovation: (1) the amount of variety among those contributing to the discussion prior to the participant's innovative post, (2) the amount of collaborative versus argumentative posts that have been made in the discussion prior to the participant's innovative post, and (3) whether the discussion includes previous posts from the participant prior to the innovative post. We focused on these three different elements of a person's contribution in relation to their context to assess the extent to which the context affects whether an individual will offer an innovative post in an innovation contest. Examining the literature on these three elements led to the following three research questions:

1. Does the variety of backgrounds of participants contributing to a discussion thread affect whether a person will post an innovative idea?

2. Does the nature of online discussions in which participants primarily add their own perspectives rather than argue with others affect whether a person will post an innovative idea?

Table 1.   Example discussion having thread, comment, and reply level[*]

Subject		Body
Thread level	The advancing of entrepreneurship starts small	Dr. Paul Chandler wrote a book, *Bound to the Hearth by the Shortest of Tether,* about his experiences in rural China, Brazil, and other areas where there is a lower class. Most of these places have no money, but given the right opportunities to better themselves can become small success stories. What he expresses is the need for people all over the world to gain human rights equivalent to the United States Constitution's 5th Amendment Takings Clause. This is the use of property USUFRUCT (right to use property as seen fit); Exclusivity (right to keep others off one's land); Transferability (right to buy or sell land or pass on to children); Permanence (has Usufruct, exclusivity, and transferability forever). All of these combine to create an atmosphere of Stewardship, and a good steward will make his or her property better, worth more, and more useful because of private ownership. The steward has a permanent stake in the land use and will use it to the best of his/her ability. Bad stewards will sell their land to good stewards or learn how to take care of their lands better and make them more productive. This self-interest and risk will create discipline to work for the best quality and use, which in turn leads to good managers being copied and making the cycle spiral upward. The role of governments in this? Enforce laws that protect private property and keep politics out of private affairs. In all things we have to start at the bottom and work our way up; trickle-down economics works in theory, but as everyone knows is lousy in practice. It actually makes it more worthwhile to not pay workers and lay them off rather than give them a competitive salary where they can afford the products they are helping to manufacture. [. . .] The building almost fell in 2008; personally, I feel there was a smarter solution to the problem than the Wall Street bailout. Take all that money and give it to those in the lowest income tax brackets. They will either spend the money, save the money, or invest the money, and all three are what is needed to bring the economy back. Now we are limping along in the U.S.A., hoping to be paid back some day from the huge loan we just gave the banks. Next time we should let them fall. Because they forgot how to be good stewards and bad stewards, fall so good stewards can rise up and take their place. [. . .]
Comment level	Property Rights	Hi Kristopher - Your post assumes that the poor actually own land. Only 1% of the world's land is owned by women, whereas 70% of the poor are women. I hope you see the connection here. Furthermore, the poor that do own land or have settled on government land face incredibly high barriers obtaining land titles. This often prevents them from utilizing the land for enterprise for fear it will be taken away from them due to the lack of a piece of paper. See Hernando de Soto's research and efforts on this issue.
Reply level	Thanks for the insight	I had no idea about those statistics, so I have to say I must step back to those with better information; however, some of what you said does prove a point on my end as well. People do settle on land but fear being forced off of it, which could in turn lead to abuses of the land because technically they feel no responsibility for it, no stewardship. Perhaps the problems lie in the laws that prevent people from having official ownership of land, even if they have lived on it for a significant period of time. I know that in the southwestern U.S. there are some laws still on the books that allow for people to gain ownership of land as long as no one else has claim to it and they make improvements on it over a period of 2 years or so. This will not be an easy issue to work on, but certainly it is important, especially to increase ownership of land to women. Thank you for reading and replying, Kristopher Pring.

[*] Comments marginally copyedited for legibility.

Table 2. Strategic thrusts and example coded post (with key sentences made bold)

Innovative Strategic Thrusts (by USAID)	USAID description of thrust	Example post coded as matching the strategic thrust[*]
Build from the experience of complex science and technology to identify, describe, and prioritize challenges; scan for patterns and systems failures; and determine how to address the challenges.	Employ a systems thinking approach, take into account the inter-relationships between challenges and activities addressing them. Rather than assuming linearity, work on multiple, concurrent, parallel, or related tracks.	We do need to see the large scale effectively, but I do not believe that is in opposition to small scale awareness. Large scale issues by definition deal with complex systems, and there is much talk of "scale-free" behavior in that world. (Behavior that manifests similarly at different sizes.) **I'm a big proponent of finding the patterns and metaphors in large issues so that they are real to a person's experience in the moment.** This opens the door wide to creative non-linear thought and problem solving. Action becomes much more possible as well. The overwhelmingness of trying to cognitively process such complexity is indeed daunting.
Employ Web 2.0 technology to identify issues, converse, generate ideas, and co-create solutions and change.	Imagine a Facebook-like platform allowing development professionals, farmers, medical field workers, university staff, corporate executives, and indigenous rural women to engage in dialogue and solution-generation together and to work with think tanks, learning circles, and digital or interactive media.	Some years back, the then-president of Nokia had a vision for the company: **"Internet in every pocket."** What if we made that a Grand Challenge for **all people across our planet, literally?** And then followed that up with focused efforts to make available through that ubiquitous access content and linkages that can provide locally **accessible educational, health services, agricultural pricing, and practice information along with links to potential markets-buyers, business related content, etc., etc.** And include in this Grand Challenge the social networking where virtually anyone at any place can link directly with those that can make a difference; take the friction out of the system. This may not be "the" Grand Challenge, but it is certainly one worth pursuing.
Create a "UN Agency for Global Business Facilitation," a partnership between global government and businesses.	The goal of the agency would be to foster more conducive environments for doing business: facilitating start-up, operation, and management of businesses, including procedures for import and export and compliance on standards, safety, and environmental conditions.	**The greatest challenge facing humanity is that of building global governance to confront all the many challenges inherent in globalization. Global governance is NOT world government, but rather finding the means as an international community of bringing the challenges of runaway globalization under some universal control and harnessing the positive elements of globalization with a set of interlocking regimes and structures with the UN at its core.** The idea of global governance was developed by an important UN report, *Our Global Neighborhood*, which was issued in 1995 but never implemented. This report needs to be dusted off, updated, and an agenda created for the rest of the 21st century. I have proposed in other fora the need for a Conference on Global Governance to be held this year, or as soon as possible, to map out this agenda, and I suggested it be held at the historic Mohonk Mountain House in New Paltz, New York, where the first international conferences were held in the late 19th and early 20th centuries, which led to establishment of the International Court of Arbitration: the first successful effort to organize the international community for peace. The symbolic nature of this venue would help propel the ideas developed there into the public imagination.
Leverage lessons learned from city sustainability plans.	Use the city sustainability plans of San Francisco and Portland as models. Adopt a back-to-basics	Many countries are suffering drought currently, like Australia and especially China. Consequently, CPI may increase, caused by drought. People are not just **suffering from a lack of clean water, but also from high**

Table 2 (*Continued*)

Innovative Strategic Thrusts (by USAID)	USAID description of thrust	Example post coded as matching the strategic thrust[*]
	approach starting with food, water, shelter, and security. Grow more food with less water; support sustainable farming; encourage a healthy lifestyle and clean water supply.	**prices of goods and services. The most impressive advertising about the environment** I have ever seen is "Don't let the last drop of water be a human's tear." **Participants have to save water on a daily basis.** It is our responsibility.

[*] Comments marginally copyedited for legibility.

3. Do online discussions in which a person repeatedly contributes affect whether the person will post an innovative idea?

These three research questions explore different sides of the context for a poster. Note that only the third research question concerns previous behaviors of the person contributing the innovative post. The other two research questions concern the context of the online discussion's thread that has been developed by participants who do not post the innovative idea for that discussion thread. This focus on others in the discussion thread, not just the innovative poster alone, is unique among the research in crowdsourcing. We briefly review the literature for the three research questions.

3.1. Context element #1: Variety of those engaging in a discussion thread

Some researchers have suggested that participants in a contest who have more experience and familiarity with the topic will know what content is innovative and will have the capability to generate the innovative ideas (Leonard & Rayport, 1997; Schulze & Hoegl, 2008; Ulrich, 2011). For example, von Hippel (1988) suggests that lead users who are most familiar with a company's products and services are in the best position to contribute innovative ideas for new products. However, other scholars have suggested instead that the ability of any single individual to contribute innovative ideas during crowdsourcing may be less a function of that individual's degree of familiarity and more a function of *how varied* the familiarity background is of those who participate in the discussion (Armisen, Majchrzak, & Almirall, 2014; Frey, Lüthje, & Haag, 2011; Howe, 2006). Variety among those participating in groups has been demonstrated to inform and spark new ideas in others, thereby leading to more innovation (Maznevski, 1994; Paulus & Nijstad, 2003).

Consequently, we decided to examine the role of variety across different levels of familiarity. We examined the variety of all participants in a discussion thread prior to an innovative post. That is, if the fourth post in a discussion was rated as innovative, we calculated the amount of differences between participants prior to that post. We were able to examine variety of background because USAID required during registration that participants answer the question of how familiar they were with the topic of Grand Challenges for USAID: 'not familiar,' 'just a little familiar,' 'somewhat familiar,' 'very familiar,' or 'I have worked in/presently work in this field.' Participants were evenly distributed among the different familiarity levels.

3.2. Context element #2: Whether participants focus their contributions in the discussion thread on arguing versus contributing new perspectives

In any innovation contest, an individual may make a top-level post: a post that starts a discussion thread. They may also make a comment in a discussion thread or a reply to a comment that was posted by someone else. Based on close examination of participants of discussion threads using the collaborative technology of wikis, it has been found that when participants add comments, they are generally adding their own unique perspective to a discussion (Majchrzak, Wagner, & Yates, 2013), such as adding a new answer to a question posed in the top-level post. Table 1 shows an example of adding a new perspective as a comment to a top-level post. In contrast to posts that add new perspectives are posts that engage in back-and-forth comment-reply-comment-reply argumentation; research has shown that these back-and-forth replies are typically a deliberation over an issue of conflict (Kane, Johnson, & Majchrzak, 2014; Tauszcik, Kittur, & Kraut, 2014), such as arguing about whether a solution is the correct one.

The extant literature supports two schools of thought on the effect of arguing versus adding perspectives for generating innovation. Some scholars contend that back-and-forth replies foster innovation because they encourage participants to continuously

contrast their perspectives with those of others; this in turn creates a motivation to resolve the differences, which causes conceptual reframing and more innovative ideas (Tsoukas, 2009). In contrast, other scholars assert that arguments often devolve into non-innovative interpersonal conflict; in this view, adding new perspectives is more likely to generate innovative solutions because others reading the new perspective will be able to note the differences without negative confrontation (Majchrzak, More, & Faraj, 2012). So the question we addressed was whether participants were contributing comments (adding) or replies to replies prior to the innovative post.

There were 128 top-level posts ranging from threads of only 1 post to threads of 7 posts. The 591 posts were distributed across the 128 threads, with some posts as top-level posts, others as comments, and others as replies. The subsample of 64 innovative posts was also distributed such that some were top-level posts, some were comments, and others were replies.

3.3. Context element #3: Has the person posting an innovative idea previously posted in the discussion

A distinction can be made in participation behavior between those who post once and only once and those who post more than once. Of the 254 participants, 149 were single posters and 105 were repeat posters. Previous research on observers indicates that most single posters have observed for substantial periods of time before posting (Faraj, Jarvenpaa, & Majchrzak, 2011). Therefore, single posting behaviors are indicative of a contribution purposefully inserted after observing others' behaviors in the contest, followed by observations of the effect of that contribution on continued discussions.

Scholars are of two orientations regarding the effect of previous posting on innovativeness of a future post. Some scholars (Kane et al., 2014) argue that the most innovative ideas come from contributors who only post once. These peripheral members do not feel a part of the community of other posters and are thus not hindered by social norms about what would be considered appropriate ideas to share. Because their posts are not bound by existing social constraints, these peripheral members are thought to offer more innovative posts. In contrast, other scholars maintain that the most innovative ideas come from repeat or core participants because these individuals have spent the most time contrasting their perspectives with others, are most likely to be brokers between different perspectives, and are most motivated to resolve contrasting perspectives and cognitively reframe their views to generate an innovative post (Feller, Finnegan, Hayes, & O'Reilly,

2012). Therefore, we examined whether innovative posts were being offered by those who only posted once versus those who posted repeatedly.

4. Findings

Our analysis first focused on each of the three research questions individually. The relationship between the three research questions requires a larger sample size than the one we studied, and thus is relegated to suggestions for future research. Nevertheless, we found three different ideal profiles for generating innovative posts.

### 4.1. Profile #1: Discussion threads with varied personal backgrounds

To examine the effect of contributors' variety of discussion threads on innovative posts, we used the Teachman formula for variety across the familiarity of participants engaged in the discussion prior to each post (Harrison & Klein, 2007). We calculated variety for each discussion thread prior to an innovative post and each discussion thread prior to a non-innovative post (Teachman, 1980).

We found a significant difference between discussion threads prior to innovative versus non-innovative posts; that is, variety in the discussion thread is higher prior to an innovative post (mean=0.90) than a non-innovative post (mean=0.77). This was a significant difference: $t(54)=-2.41$, $p=0.02$, as shown in Figure 2. A robustness check employing a different form of variety based on the different types of jobs ('executive,' 'small business owner/entrepreneur,' 'project/program manager,' 'staff,' 'student,' 'consultant,' 'other,' 'teacher/educator,' 'unemployed,' or 'volunteer') was used. It was also significantly higher ($t[54]=-2.63$, $p=0.01$) prior to an innovative post (mean=1.32) than a non-innovative post (mean=1.11). Moreover, after controlling for level of familiarity of the individual making the innovative post, the difference was still significant. This suggests that variety among those earlier in a discussion thread affects whether an innovative post is contributed later in that discussion thread. This suggests that the more varied the participants in a discussion thread, the more different perspectives they share, increasing the exposure of other participants to different perspectives and consequently sparking an innovative thought.

### 4.2. Profile #2: Discussion threads where contributions add perspective, not argumentation

We calculated the position of the posts in the discussion as top level, comment level, or reply level.

Figure 2. Significant difference in the average diversity in the current thread where the innovative post occurred is more likely to be associated with innovation (M=0.90) and non-innovative (M=0.77) conditions; t(54)=-2.41, p=0.02
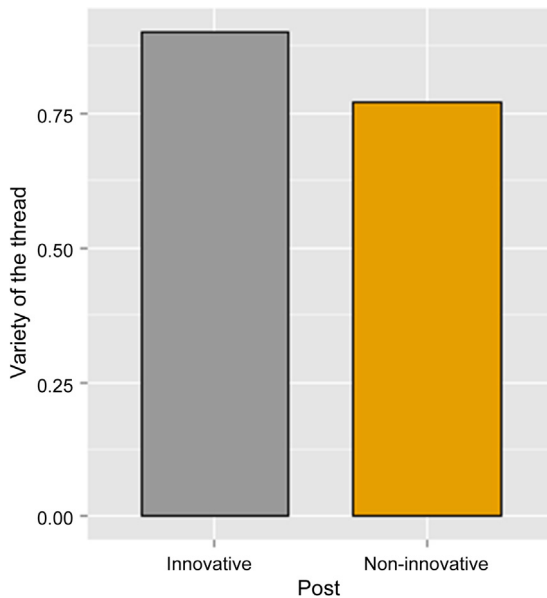
If arguing fosters innovation, then we would see more replies to replies occurring in the discussion thread prior to the innovative post. If adding new content fosters innovation, then we would see more

Figure 3. Significant difference in the position where the person posted in the discussion (1.. top level, 2.. comment level, 3.. reply level) with innovative (M=1.63) and non-innovative (M=1.45) posts; t(51)= -2.11, p=.04
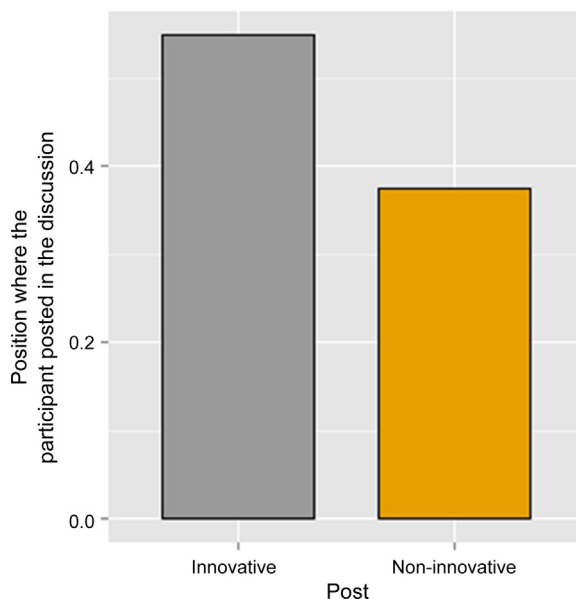

comments occurring in the discussion thread prior to the innovative post.

As shown in Figure 3, we found that position of the posts were more likely to be top-level or comment-level discussion threads prior to an innovative post (mean=0.55) than prior to a non-innovative post (0.38). This was a significant difference (t[50]=-2.11, p=0.04) indicating that, on average, innovative posts were more likely to occur in discussion threads composed of comments (construed as adding perspectives) than replies to replies (construed as argumentative). By offering comments instead of replies to replies, participants are avoiding direct conflict and a narrowing of the discussion to the point of conflict among two people. By offering more and more comments, additional content and different perspectives are shared, helping participants to spark new, innovative ideas.

4.3. Profile #3: First-time posters

We subdivided the sample of all participants into those who posted only once—referred to as 'first-time posters'—and those who posted more than once. Of the 105 posting more than once, the median number of posts was 3. We conducted a chi-square test to determine if repeat or single posters were more likely to offer innovative posts. As shown in Figure 4, the percentage of innovative posts was significantly higher among the first-time posters (15%) than repeat posters (9%), χ^2(1,N=591)=3.77, p=.05.

Figure 4. Percentage of innovative posts was higher among the first-time posters than the repetitive χ^2(1,N=591)=3.77, p=.05
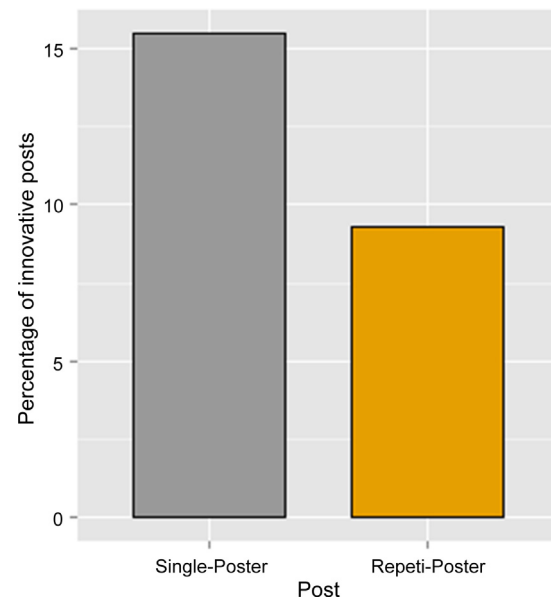
While first-time posters only posted once, research indicates that they often spend considerable time observing the behaviors of others prior to posting (Füller, Möslein, Hutter, & Haller, 2010). By observing other participants and how ideas affect the community, first-time posters focus more on adding their perspectives instead of engaging with the community for support or help (Füller et al., 2014). Thus, first-time posters bring value to the innovation contest by adding their perspective, even though they do not engage in dialogue with participants.

5. Guidelines for managing crowds participating in innovation contests

Tapping the innovative potential in an innovation contest can be achieved by using three guidelines developed from our findings along with a proper reward structure that aligns the person's motivation for competition and cooperation (Hutter et al., 2011). We have organized the three guidelines into a 2x2 framework, as shown in Table 3. The framework distinguishes between two dimensions of participation: origination from repeat versus first-time posters and the nature of the posting in the discussion threads prior to the innovative post.

5.1. Guideline #1: Ensure discussions include non-experts

Our findings suggest that a variety of personal expertise about the topic, not simply expertise level with it, encourages innovative posts. Since most innovation contests are moderated by representatives of the sponsoring company, these findings suggest that moderators should encourage a variety of expertise rather than focus on capturing expert participants that are likely to offer the same view (von Hippel, 1988). This guideline may be particularly

important for innovation contests over more generic crowdsourcing (Brabham, 2008) because in such contests the interactions among varied individuals, not simply the level of expertise, are what drive the innovation. To ensure that discussions include non-experts, moderators and managers should require the crowd to register their level of familiarity with the topic; if registrations indicate only a narrow band of people participating, the contest may need to be promoted in a way such that others believe they have something to contribute. Once a range of levels of expertise are included in the registered pool, the discussion threads should be monitored to assess how the different levels of expertise are distributed within each discussion thread. If there appears to be only a narrow band of expertise contributing to a discussion thread, registered participants can be targeted and individually solicited to participate in particular discussions.

5.2. Guideline #2: Encourage participants to add perspectives rather than argue

Innovation contests seek to solve specific problems. This research suggests that innovation is likelier when comments for adding new solutions and perspectives are posted in discussion threads, as opposed to reply-to-reply arguments. Reply-to-reply posting appears to replicate knowledge rather than add new knowledge (Majchrzak et al., 2013). Since arguments are rarely won in these contexts, except through attrition (Kane et al., 2014), reply-to-reply posting appears to waste valuable person time; moderators, then, should monitor the progress of innovation contests to note when reply-to-reply posting begins to occur in a discussion thread, and encourage participants to offer their own perspectives as comments. In addition, incentives should be considered (Füller et al., 2010) for encouraging participants to post comments as new perspectives. Such incentives can take the form of badges that can

Table 3.   Framework for participation guidelines

Person Posting Characteristics of Discussion Thread	First-Time Posters	Repetitive Posters
Varied levels of expertise represented in thread	First post of the person matters. Manager should seek to attract as many participants as possible since the first contribution of each person tends to be the most valuable.	Managers should seek to recommend through newsletter or email those threads that maximize the person's potential based on his familiarity level compared to those already present in the thread.
Focus posting on adding new perspectives rather than arguing		Managers should actively avoid deep arguments and promote exchanges of perspectives at the top-level and comment-level post.

be turned in later for valued rewards or points that add to one's reputation as a helpful collaborator (Füller et al., 2010).

5.3. Guideline #3: Encourage first-time posting as well as repeated posting

Our findings indicate that first-time posters are important to the innovation process. While repeat posters may not post the most innovative ideas, they are also—at least indirectly—important to the innovation process through continuance of activity in the contests. Without any activity, first-time posters are unlikely to attend, observe, and ultimately engage; thus, managers should encourage people with different motivations and expected levels of effort to participate. Messages such as ''Even one post makes a difference'' signals to potential participants that they do not have to take on a long-term commitment or be part of a community.

6. Conclusion

Innovation contests are a critical mechanism for implementing open-innovation strategies in firms today. Conducting these contests properly will help determine if new innovations can be derived from the crowd. Heeding our three guidelines should improve the likelihood that contributions from the crowd will be novel and implementable for the firm.

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