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# **Comparison of Crowdsourcing Platforms from Social-Psychological and Motivational Perspectives<sup>1</sup>**

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# **Comparison of Crowdsourcing Platforms from Social-Psychological and Motivational Perspectives**

## **Abstract**

The increasing need to compete in innovation and the prevalence of IT in social and economic interactions have led to greater globalization in innovation sourcing, particularly through online crowdsourcing platforms. Crowdsourcing platform participation, a phenomenon inadequately covered, is an instance of providing an innovative solution or idea intertwined with personal and social factors that interact to result in a behavior. A better understanding of the impact of social factors and participants' hedonic, utilitarian, and social motivations can guide the design and management of these crowdsourcing platforms to foster sustained engagement. This study considered the competitive and social nature of these platforms and analyzed participation intentions from a novel standpoint—a combination of motivational and socio-cognitive perspectives and their relationships within two different types of crowdsourcing platforms: Atizo's third-party-hosted community and Nokia's brand-hosted IdeasProject community. A comparison of these two types of crowdsourcing platforms for the same activity of ideation at an individual level revealed differences in behavior determinants based on the platform host type, domain specificity, and mechanisms supporting different motives and social factors.

## **Keywords**

crowdsourcing, social-psychological perspective, motivational perspective, technology adoption, third-party hosted platform, brand-hosted platform

# 1 Introduction

Open models of innovation widely suggest using external sources for the innovation process. One way to involve external sources is by opening up the innovation process to online crowdsourcing communities, which can provide platforms for companies to access a loosely knit community of innovators (Jeppesen & Lakhani, 2010; West & Bogers, 2014) and enable new forms of ideation and idea management (Lindič, Baloh, Ribière, & Desouza, 2011). Such communities diverge from open source communities mainly owing to the existence of the offered monetary rewards, which fulfill the participant's utilitarian motives, and the novel individual tasks required to be completed in a limited time. However, among the community participants, only one or a few can win the reward. The interaction between individuals in these communities also differs, often indirectly through comments or ratings. Likewise, there is no single, common goal that drives a moral obligation for a social benefit; rather, there are many unrelated tasks for a brand or for separate organizations. Thus, the contributions are not necessarily seen as serving a public good or a community interest, and, even if they were so, community interest would conflict with the nature of the crowdsourcing communities' competitive, self-interested environment. These features that are present in the crowdsourcing communities' context make it rather unique compared to the prior community contexts.

Furthermore, these communities vary considerably in terms of their activities, also known as challenges, which can range from idea generation (e.g., Atizo) to coding (e.g., Topcoder) and from platform host, such as a company-initiated brand platform (e.g., P&G's Connect+Develop [Huston & Sakkab, 2006]) to a third-party-initiated platform (e.g., InnoCentive [Albors, Ramos, & Hervas, 2008]). Participants on these platforms can intervene at different stages of the innovation process (e.g., ideation, design, or prototyping) to create a variety of crowdsourcing platforms. Among those, the ideation process is the most common activity focus of these platforms.

Ideation, the generation of new ideas for products, services, and processes, can occur when communities crowdsource ideas in an open call format (Howe, 2006), and this trend within crowdsourcing platforms can be initiated and hosted by companies to focus on their company matters or by third-party platforms to assist several companies with their needs. These third-party platforms (e.g., InnoCentive, NineSigma, and Atizo) act as an agent or broker between two or more parties, such as users and companies, to support the innovation process in a variety of domains. Despite their common competitive online settings, the two host types create two platforms that differ in substantial ways: third-party-run platforms propose a diverse set of challenge topics (e.g., various domains for InnoCentive), but brand-hosted crowdsourcing communities post challenges based on their brand-related issues (e.g., consumer goods for P&G's Connect+Develop, mobile technologies for Nokia's IdeasProject) in a more specific domain that they operate. Thus, the differences among host types have given rise to a variety of challenge domains. Further, participants involved in third-party-initiated communities are not necessarily the companies' customers or users, which is the case of a brand-initiated community such as Dell's IdeaStorm. Therefore, in third-party-initiated communities, a strong relationship does not exist between the participants and the brand/company (Antikainen, Mäkipää, & Ahonen, 2010), and this creates different motives for participation. Likewise, the social community aspect of brand communities could profoundly influence members' attitudes towards participation, unlike a third-party-initiated case. Thus, it is imperative to consider the impact of such differences due to host type.

Furthermore, only a few online communities manage to retain their participants (Wasko & Faraj, 2005). Thus, improving their platforms' mechanisms and designs is critical to assessing participants' needs and more efficient use of platform resources in order to sustain themselves. This behavior is likely influenced not only by personal motivations but also by contextual forces, such as individuals' attitude or norms; therefore, a theoretical framework is applied based on the theory of planned behavior (TPB), augmented with the inclusion of hedonic, utilitarian, and social motivators.

The objective of this study is to explore the specific social factors and motives that either increase or lessen people's intention to participate in two types of crowdsourcing platforms. By selecting two different types of crowdsourcing platforms—a third-party-hosted and a brand-hosted—for ideation activity, this study posits a difference in participants' motives and factors affecting their behavior at an individual level with the same model. Following this aim, this paper addresses three research questions: What motives underlie participation behavior in third-party-hosted and brand-hosted communities? Which social factors and motives have a greater impact on the intention to participate? How can such platforms improve their mechanisms in order to attract and retain more participants? Thus, this study builds on a larger body of theoretical and empirical work by examining the TPB and theories of motivation.

## **2 Literature Review**

On these crowdsourcing platforms, the member's role in supplying new information plays a significant part in sustaining these online communities. This explains the focus of prior studies on participation behavior. In attempting to understand participants' contributions, researchers in prior studies adopted either a social-psychological perspective based on social cognition models (e.g., TPB [Bagozzi & Dholakia, 2006]) or a motivational perspective (e.g., intrinsic and extrinsic [Lakhani & Wolf, 2003; Pee, Koh, & Goh, 2018]). However, the application of such theoretical bases was rather limited within the crowdsourcing context based on the review of Zhao and Zhu (2014).

Prior studies portray participants as utility maximizers (Zheng, Li, & Hou, 2011) who engage in a given activity to achieve direct or indirect compensation, such as money, reputation, or recognition (Antikainen & Vääätäjä, 2008). This is why, for instance, enhancing a perceived reward through task designs or by using pricing schemes was proposed for retaining and engaging micro-task workers (e.g., Difallah, Catasta, Demartini, & Cudré-Mauroux 2014; Gadiraju & Dietze, 2017). Following the open source movement, a number of studies additionally considered the existence of hedonic motives (i.e., inherent satisfaction, such as enjoyment and curiosity) (Breitsohl, Dowell, & Kunz, 2013) and determined these motives are as decisive as monetary rewards (Davis, 1989; Verhagen, Feldberg, van den Hooff, Meents, & Merikivi, 2012). While the literature contains no consensus on the effects of intrinsic and extrinsic motivations in online communities (Borst, 2010), it has been increasingly observed that participants not only supply new information with an expectation of winning a reward but also comment on others' ideas to further improve them or show their support. This may involve posting comments starting with phrases such as “excellent idea” or “good idea, you can improve it with...” With the maturity of the community, it was also observed that the number of comments and messaging was augmented.

Following these trends, studies also focused on the socio-technical aspect of online platforms that allows social interactions (Kaufmann, Schulze, & Veit, 2011). Based on

the structure of interaction, social motives appeared to activate participation on crowdsourcing platforms (Leimeister, Huber, Bretschneider, & Krcmar, 2009; Peng & Zhang, 2010). Interviews with platform owners also confirmed the existence of social (i.e., networking) and hedonic factors, not utilitarian motives alone, for participation. This explains the use of mechanisms such as profile creation and messaging that platforms experiment with through trial and error. Thus, the increasing number of comment threads, messaging between participants, and time spent within these competitive community settings presents that hedonic, utilitarian, and social motivators are present in a substantial way. This prompts the need for advanced research on participation behavior from a general motivational perspective that combines social, hedonic, and utilitarian motives.

Furthermore, studies using social cognition models, such as the theory of planned behavior framework, have inadequately modeled the related behaviors without any attempts to capture the extent and impact of personal motives (e.g., Bagozzi & Dholakia, 2006). This eventually precipitates an inadequacy of their completeness because these approaches lacked the impact of either contextual forces or personal motivation. This limited the view of crowdsourcing community participation, which is an instance of providing an innovative solution or an idea intertwined with personal motives and social factors. Therefore, to complement the existing studies in a new context and to focus on interactions of motives together with attitude and understanding the part of attitudes, social norms, and perceptions about control on participation behavior, this study presents an augmented theory of planned behavior model.

### **3 Theoretical Background and Hypotheses Development**

#### ***3.1 Theory of planned behavior and theories of motivation***

Given the complex and competitive nature of the innovation process, we focused on the rational decisions individuals make to actively engage in crowdsourcing platforms. These platforms consist of individual members; therefore, the decision to participate in a crowdsourcing platform is likely to be influenced by subjectively evaluating new idea creations or solutions to problems and thus probably subject to the motivation to participate in the first place. For example, enjoyment may reflect one's rational choice to participate in solving problems or creating new ideas. Hence, the role of intended behavior and underlying motivations becomes especially important in our framework. To explain how pertinent individual and social antecedents are to an individual's intention to engage in participation behaviors, this study relies on the TPB, a rational decision-making model, to explain behavioral intentions, which are perceived as being direct predictors of a behavior (Krueger & Brazeal, 1994).

The TPB is an appropriate model to use in the crowdsourcing community context because it is equipped to embrace personal determinants and social surroundings in addition to nonvolitional determinants that influence individuals' decisions. Hence, it is a more complete version of the priori theories. It is also one of the most powerful conceptual frameworks because of its applicability across a variety of settings (Ajzen, 1991). According to the TPB, behavioral intention is based on the reflection of three determinants, namely attitude toward behavior, subjective norms, and perceived behavioral control (PBC) (Ajzen, 1991). Thus, the TPB attempts to determine the relationship between these proximal determinants of an individual's intention by using confirmatory modeling techniques in any context.

Despite its extensive use to explain individuals' decision making, the TPB's completeness has been questioned for its sufficiency (Perugini & Bagozzi, 2001), simplicity (Bagozzi, 2007), and lack of generalizability (Hagger, Chatzisarantis, & Biddle, 2002) because behavior is not always a function of computational rules (Chatzisarantis, Hagger, Smith, & Sage, 2006). Therefore, the standard TPB model has been supplemented with additional external predictors for the particular context (Armitage & Conner, 2001). For instance, adopting motivations from self-determination theory (Ryan & Deci, 2000) that mainly focus on behaviors related to health and well-being might still provide the necessary conjecture in an online participation context owing to their spontaneous forms (e.g., K. C. Chen & Jang, 2010; Kelley & Alden, 2016). Thus, theoretically, the TPB is open to modification as a model to enhance the prediction of behavior after the original TPB constructs have been considered to be adequate in a particular context. Furthermore, depending on the individual and the situation, attitude, norms, and perceived behavioral control might have different effects and weights on behavioral intention (Miller, 2005). Thus, to increase the predictability and to embrace the internal factors involved in crowdsourcing communities, in this study, the additional predictor variables of intrinsic and extrinsic motivations were included because each amplified the prediction of the individual's intention to participate.

Constructs external to the TPB model are assumed to influence intentions only to the extent they affect either attitudes or subjective norms (Fishbein & Ajzen, 1975). Among those, attitude can hold both cognitive (i.e., self-determination theory) and affective (i.e., self-worth theory) factors (Schepers & Wetzels, 2007) and in several cases it has been presented as a mediating variable within technology acceptance models (e.g., Y. J. Kim, Chun, & Song, 2009; Rana, Dwivedi, Lal, Williams, & Clement, 2017). For instance, self-determination theory implies that intrinsic motivation derives from an attitude of determination to accomplish a specific objective. However, the literature is rather silent regarding the effects of motives on attitude, except for a few studies in different contexts, such as social networking sites (e.g., Moon & Kim, 2001; Muhammad, Leng, Lada, & Ibrahim, 2011), which found both intrinsic and extrinsic motives are significant antecedents of attitude.

In line with prior researchers, we augment the TPB model with intrinsic and extrinsic motives that are measured under the attitude construct. In this way, this study aims to complement prior studies that adopted either a social-psychological perspective based on social cognition models or a motivational perspective (Bagozzi & Dholakia, 2006; Hars & Ou, 2002). Thus, each predictor's weight differences will assist in determining members' reasons for participating in crowdsourcing platforms by focusing on whether it is for personal assessments, norms, perceived control, or intrinsic or extrinsic motives.

### ***3.2 Hypotheses and measures***

Enhanced motivation promotes performance (Wilson, 2005). However, the question is whether this effect is a result of intrinsic motives, extrinsic motives, or both. According to self-determination theory, extrinsic motivation refers to the behavior guided by a valued, separable outcome (Deci & Ryan, 1985; Ryan & Deci, 2000). Thus, extrinsic motives ascend from aspects outside the individual, such as gaining financial rewards (Krishnamurthy, 2006) and enhanced reputation among others (Ke & Zhang, 2008). According to interviews with platform owners, crowdsourcing platforms use both rewards and reputation systems as the embodiment of extrinsic motives to support participation. Hence, extrinsic motivations mediate the effects of the platform's support mechanisms on

users' attitudes toward intention to ideate. We then anticipate that if users are extrinsically motivated by ideation, they will have a positive attitude toward it.

Following this, numerous organizations use reward systems that positively affect employee attitudes toward participating in knowledge sharing (Koochikamali, Gerhart, & Mousavizadeh, 2015). With online communities, the quest for the motivations to explain participatory behavior presented contradictory results. For instance, several studies concluded that monetary rewards do not necessarily escalate participation in virtual communities (e.g., Lu & Yang, 2010; Wasko & Faraj, 2000). However, in the crowdsourcing labor market context, the primary motivation for most participants was found to be earning financial rewards (e.g., Gadiraju, Kawase, & Dietze, 2014; Sun, Wang, Yin, & Zhang, 2015). Due to the similarities of our context to the crowdsourcing labor market, rewards are also considered to be a decisive extrinsic motive.

Other extrinsic factors were also gradually considered, especially in open source communities that have broadly acknowledged the importance of reputation, which is largely based on building positive evaluations from peers, as a major driver of participation (Cai & Zhu, 2016). These evaluations are often conducted by rating others, which is a user-driven reputation system (Jøsang, Ismail, & Boyd, 2007). In online settings, reputation is users' overall perceptions of an individual when they interact with each other online. Additionally, crowdsourcing communities allow content-driven reputation systems through comments. Because the desire for reputation building attracts individuals to participate (Sharma, Sugumaran, & Rajagopalan, 2002), individuals actively comment on and rate others. Hence, individuals in crowdsourcing communities would also have a desire to build their own reputations. Even though a number of studies have considered reputation as an intrinsic motivation (e.g., Khan, Waqas, & Muneer, 2017), the participator does gain social value (social exchange theory [Blau, 1964]), which is an outcome of the participation process in such platforms. Users are also assumed to possibly use their reputation for obtaining efficiency gains or to expect their reputation to be cashed in on in the future (e.g., Archak, 2010). Thus, as an extrinsic motive, reputation is an important asset an individual can leverage in crowdsourcing platforms. Thus, both rewards and reputation have indirect and positive impacts on attitudes toward participating because of the utilitarian features of such platforms.

*H1: (a) Rewards and (b) reputation positively influence extrinsic motives and (c) extrinsic motives positively influence attitude toward the intention to participate in crowdsourcing communities.*

In the context of crowdsourcing, gradually, a broader set of benefits is also considered, including social and hedonic factors (D. Lee, Kim, & Kim, 2011; Marchi, Giachetti, & De Gennaro, 2011). For instance, individuals are often involved in social activities that build interpersonal relationships, and they cooperate with others as a consequence of socially driven motivations (J. Lee, Lee, & Choi, 2012; Yee, 2006). Eventually, these activities generate social capital through relationships that are essential for the community to function. Social psychology has also determined that social motives within an online community gratify individuals' social needs through interactions, and prior studies have linked social-driven motivations with individuals' participation in online communities (J. Kim, Yoon, & Zo, 2015). Yet, these social motivations can be further distinguished based on their intrinsic (hedonic) and extrinsic (utilitarian) origins (Battistella & Nonino, 2012).

Extrinsically, individuals can gain social value through participation (Battistella & Nonino, 2012). For instance, networking that builds a set of interpersonal relationships



through activities generates social capital (R. Chen, Sharma, & Rao, 2016). Earlier studies claimed that due to their remoteness and unpredictable levels of interaction, online communities are unlikely to engender the development of social capital (Nahapiet & Ghoshal, 1998). Later, in contrast, Wasko and Faraj (2005) investigated whether general social capital built by networking positively influences contributions in online communities. Considering the potential of socializing and building relationships through messaging and the comment features of these platforms, networking will be able to develop in such communities. Thus, Hypothesis 1d is proposed:

*H1d: Networking positively influences the extrinsic motive toward the intention to participate in crowdsourcing communities.*

As part of the benefits, the intrinsic motivational view is based on the individual's need to be competent and self-determined—needs that are directly associated with the enjoyment and emotions of interest (Deci & Ryan, 1985). The hedonic drivers of participation include enjoyment that derives from individual motives (Alalwan, 2020; Nov, Naaman, & Ye, 2010) and a sense of cooperation (i.e., intellectual stimulation [Riding & Gefen, 2004]), which is socially integrative. Here, the enjoyment is self-oriented (i.e., concentrated on the self), whereas sense of cooperation is directed at the community (Teichmann, Stokburger-Sauer, Plank, & Strobl, 2015).

Studies analyzing the direct impact of hedonic factors on behavior in online communities have presented these factors as important in terms of direct value (Teichmann et al., 2015; Tonteri, Kosonen, Ellonen, & Tarkiainen, 2011) or indirectly significant through community identification and relationship satisfaction (Tsai & Pai, 2013). Specifically, intrinsic motives are associated with individuals' positive subjective experiences, and the subjective experience is used to construct attitude (Winke, Bless, & Biller, 1996). Yet, only a few studies have analyzed the indirect impact of intrinsic motivations through attitude (e.g., Feng, Fu, & Qin, 2016; Verhagen et al., 2012), and some have presented its positive effect on members' attitudes (e.g., Verhagen et al., 2012).

Crowdsourcing platforms also present hedonic, pleasure-oriented features because participating in ideation and solving problems is entertaining and challenging not only because of the subject of the challenge but also the task design. These provide self-fulfilling value that can lead to positive attitudes. Users may be more willing to participate in a challenge that is intellectually challenging, playful, and enjoyable. Thus, a plausible assumption is that intrinsic motivation has direct and positive impacts on attitudes toward participating in crowdsourcing platforms because of the hedonic features those crowdsourcing platforms provide.

*H2: (a) Enjoyment positively influences intrinsic motives, and (b) intrinsic motives positively influence the attitude toward the intention to participate in crowdsourcing communities.*

As Battistella and Nonino (2012) stated, some social motivations can be distinguished as intrinsic. As an intrinsic type of social-driven motivation, intellectual stimulation in the area of interest, also defined as sense of cooperation, is the feeling of being morally bound to cooperate and contribute towards a community's goal achievement (Ridings & Gefen, 2004; Wasko & Faraj, 2000). For instance, participating in crowdsourcing challenges can arouse novel ideas and stimulate one's ability to creatively solve problems.

Even though prior studies have found intellectual stimulation as an incentive for contribution, these were mainly focused on open source communities (Lakhani & Wolf, 2003; Schulz & Wagner, 2008). In idea crowdsourcing communities, cooperation is not directly encouraged because it conflicts with the nature of a competitive environment with unrelated small tasks. Still, it does take place indirectly when individuals comment on and rate others' ideas to assist them in further improvement. Hypothesis H2c is thus proposed.

*H2c: Intellectual stimulation motives positively influence intrinsic motives toward the intention to participate in crowdsourcing communities.*

Generally, online environments represent a range of activities that tap into both intrinsic and extrinsic motivations contributing to attitude (Verhagen et al., 2012). Hence, a strategy involving a mix of monetary and nonmonetary rewards represents a successful stimulus for both intrinsically and extrinsically motivated participants in an online community environment (Ebner, Leimeister, & Krcmar, 2009; Martinez & Walton, 2014). Without differentiating the community type, a number of studies considered both motives and concluded that in online communities, extrinsic motives, such as monetary rewards, are more prominent motivational factors than intrinsic motives (Antikainen & Väättäjä, 2008; Wasko & Faraj, 2005). In contrast, several studies have presented that intrinsic, rather than extrinsic, motives have a stronger influence on online participation behavior (Martinez & Walton, 2014; Zheng et al., 2011), which is consistent with the self-determination theory (Deci & Ryan, 1985).

Even though both theoretical and empirical foundations exist to analyze intrinsic and extrinsic motivations, previous studies' contradictory results cloud the understanding of the relationship between the two motivational factors and their interaction with a TPB construct such as attitude. Furthermore, motives can also vary depending on the type of community. Accordingly, it can be postulated that both intrinsic and extrinsic motives positively influence attitude; however, due to the competitive nature of platforms, extrinsic motives have a greater impact in crowdsourcing platforms. Hypothesis 3 is thus stated as the following:

*H3: Extrinsic motivations have a greater impact on the attitude toward the intention to participate in crowdsourcing communities than intrinsic motivations.*

Attitude and subjective norms, the two central components of the TPB and theory of reasoned action (TRA) models, have compound effects on behavioral intentions (Ajzen, 1991). Attitude is an individual's overall evaluation of what it would be like to perform a specific behavior (e.g., it would be good or bad for me to apply for a new job). Thus, attitudes are a function of behavioral beliefs about a particular behavior, such as participating in crowdsourcing communities.

To promote participation in crowdsourcing communities individuals must accept and use the crowdsourcing technology. Hence, theories and models of technology adoption is key to understanding how and why individuals adopt and participate in crowdsourcing. A review of the technology adoption models and theories presented that only five of them actually incorporated attitude as a predictor (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2019). However, previous research on acceptance and use of IS/IT innovations has also demonstrated that attitude is a strong predictor of behavioral intentions (e.g., Dwivedi et al., 2017; Rana, Dwivedi, Williams, & Weerakkody, 2016). As the theories

predict and the empirical evidence presented, these intentions will be determined by individual's attitude.

*H4: Attitude positively influences intention to participate in crowdsourcing communities.*

A subjective norm is one's perception of a social pressure to perform a specific behavior (e.g., most people whose opinion I value think I should apply for a new job). This involves societal, familial, or intergroup norms along with internalized morals (Ajzen, 1991). Subjective norms' direct influence on intention also results in individuals preferring to perform a behavior despite their own attitudes. For instance, key members from one's social network, such as relatives, friends, and peers, may exert a normative influence upon one's innovation behavior (Hsieh, Rai, & Keil, 2008; Valente, 1996) because they have more chances to exchange important information (Childers & Rao, 1992; Cocanougher & Bruce, 1971).

The linear effect of subjective norms on intentions has been described as a positive interaction (Grube & Morgan, 1990; Terry, Hogg, & McKimmie, 2000). However, even though a subjective norm is a component of the TPB, it is typically the weakest of the intention predictors (Armitage & Conner, 2001). Studies evaluating the direct effect of subjective norms on intention found various results and that they often presented a weak effect on intentions (Davis, Bagozzi, & Warshaw, 1989; Taylor & Todd, 1995). Despite these findings, subjective norms could possibly still be important for predicting behavior on crowdsourcing platforms due to online social pressure. Hypothesis H5 propose these ideas.

*H5: Subjective norms positively influence intention to participate in crowdsourcing communities.*

Behavioral intentions are a direct function of attitudes, subjective norms, and perceived behavioral control, but the relative importance of these constructs varies across behaviors and contexts. The TRA assumes a complementary relationship between the constructs of attitude toward behavior and subjective norms, and these interaction effects are explicitly theorized in the TPB model (Ajzen, 1991). Most studies regard the weight of norms as secondary to attitudes (Ajzen, 1991). Therefore, contextual differences are important to consider when examining the relationship of attitude and subjective norms with intentions because relationships vary with the context.

Crowdsourcing platforms tend to be designed to maintain some degree of anonymity, at least among other users. Similar to social networking websites such as Facebook, individuals can partially or completely remove this anonymity by creating a profile by which they can share their personal information and connect with others. However, the impact of subjective norms on behaviors in online settings is expected to be less effective compared to real-life settings. Owing to the lack of a strong relationship between participants because of the online setting and on the basis of prior literature, we can hypothesize that subjective norms will be less important than attitude in crowdsourcing platform participation, as proposed in hypothesis H6.

*H6: Attitude has a greater impact on the intention to participate in crowdsourcing communities than subjective norms.*

Perceived behavioral control (PBC) is a significant contributor to the predictive power of the TPB. It is an indicator of how much control people believe they have for the intended

behavior. Consider, for example, the amount of control individuals believe they have to participate in an online challenge, to follow a low-fat diet, or to get a good night's sleep. To the extent that people are accurate in their behavior judgements, a measure of PBC will also be a direct predictor of the behavior (represented by the dotted line in Figure 1) (Ajzen, 1991).

Generally, external control factors (e.g., financial resources or barriers) are more important in determining behavioral control than internal control factors (e.g., skills or knowledge). Likewise, in the case of crowdsourcing platforms, external control factors mainly determine levels of PBC. The role of skills and information is rather minimal and even inapplicable due to the type of challenge/activity in hand: ideation. Several studies have found that both intention and PBC may jointly be the function of behavior (Ajzen, 1991; Hrubes, Ajzen, & Daigle, 2001), and other studies also found the direct impact of PBC on behavior to be higher than intention (Bagozzi & Dholakia, 2006). Accordingly, this study postulates in hypothesis H7 that PBC positively affects behavior both directly and indirectly through intentions.

*H7: Perceived behavioral control positively affects (a) intention to participate and (b) participation in crowdsourcing communities.*

A basic principle of the TPB is that attitudes and beliefs influence behavior only through their impact on intentions (Price, Ratke, & Moen, 1980). This psychological phenomenon is transformed into observable actions and reactions through intention. Thus, for attitudes and beliefs to lead to behavioral action, one must decide or intend to do that behavior. Following this principle, the stronger one's intentions, the more likely will one perform the behavior. Meta-analyses of correlational studies covering diverse behavioral domains have also presented that intention remains a significant predictor of behavior (e.g., Sheeran, 2002). As a close proxy to the behavior itself, when intention becomes stronger, individuals will be more likely to engage in the behavior (Ajzen, 1991).

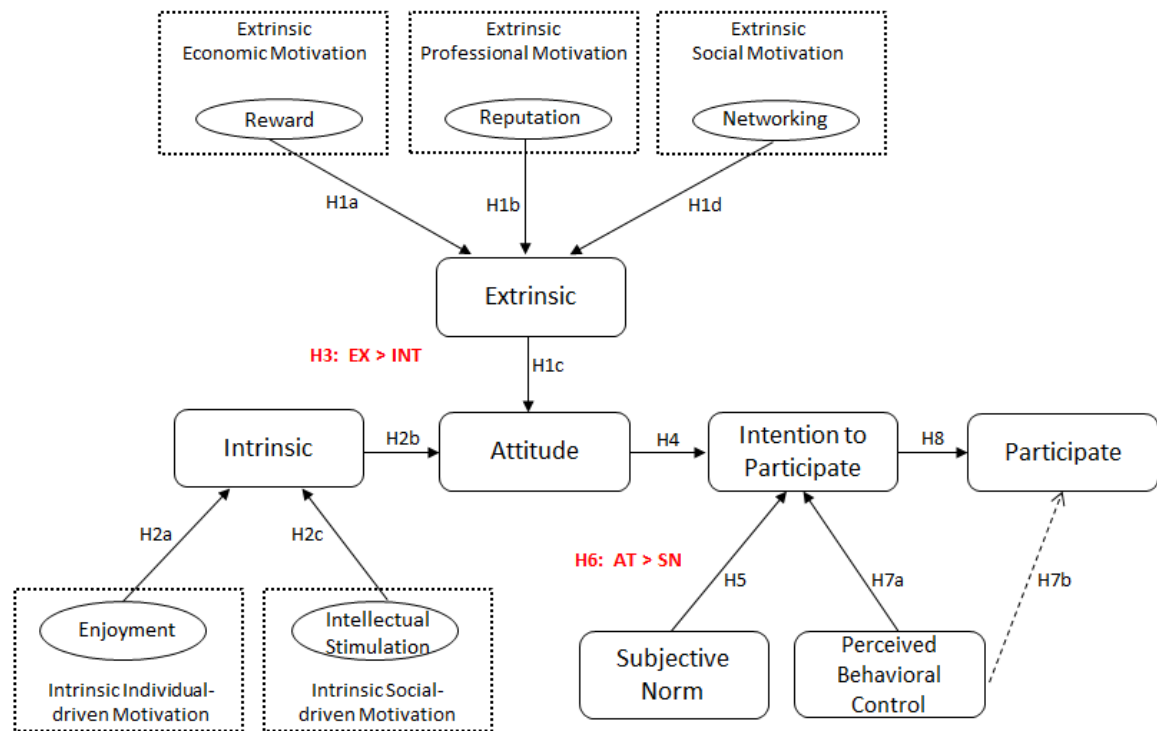
Nevertheless, critics of the TPB model have claimed behavioral intentions do not translate into behavior (McDonald, Oates, Alevizou, Young, & Hwang, 2012) and refer to this as the intention-behavior gap. Contrary to the rational aspect of the TPB, behavior is not always fully under volitional control. Earlier studies on the intention-behavior relationship have shown the correlation between intentions and subsequent behavior is rather modest (Armitage & Conner, 2001; Belk, 1985). The questionable predictive validity of intentions has stimulated a great deal of research attempting to explain the factors for the intention-behavior discrepancy, and it was found forgetting to initiate action was one of the most dominant factors (Gollwitzer, 1999). Other than memory, habits and automatic processes also affect the intention-behavior relationship (Aarts, Verplanken, & Van Knippenberg, 1998). Thus, the applicability of the TPB can be questioned in certain circumstances.

However, in the case of online crowdsourcing platforms, the factors for discrepancy (memory, automatic processes, and habits) are not relevant because each task is novel, is to be completed within a limited time, and requires an intentional initiation of action. Individuals are in control of their actions and also are subject to continued triggering of awareness through newsletters, e-mails, etc. Additionally, several studies focusing on participation behavior in social networking sites have verified behavioral intentions have a positive influence on behavior (e.g., D. Y. Lee & Jeong, 2013). Considering that crowdsourcing platforms share comparable properties with social networking sites (i.e.,

online settings, anonymity, communication methods, networking, etc.), it can be expected to observe a similar effect between the intention-behavior relationship in the context of crowdsourcing platforms. Under the presented circumstances of online crowdsourcing platforms and prior studies in similar contexts, we can expect intentions to translate into behavior. Hence, the likelihood of engagement in the participation behavior increases when intentions to perform the participation behavior are stronger. Based on the theoretical description of the TPB and the presented indirect empirical evidence, this study proposes hypothesis:

*H8: Intention to participate in crowdsourcing communities positively influences actual participation.*

Figure 1 depicts our research model based on Ajzen's (1985) theory of planned behavior (TPB). The links between the constructs were previously discussed. Note that the model is augmented to focus on interactions of motives together with attitude and understanding the part of attitudes, social factors, and perceptions about control on participation behavior. Solid lines show the main relationships in the model, and the dotted line represents a potential direct causal path between PBC to Participation. References to hypotheses H3 and H6, presented in bold red, compare the effect of the constructs within the model.



**Figure 1.** Proposed research model

## 4 Methodology

### 4.1 Research site

From a group of crowdsourcing platforms within Europe, two of the very successful ones, Atizo and Nokia, were selected based on their number of completed challenges. Atizo is a Swiss-based, third-party-hosted crowdsourcing platform on which companies present

their challenges and creative people offer their ideas and solutions. It proposes a diverse set of challenge topics on products, services, names, and event ideas to more than 200 companies (e.g., P&G, Migros, PostFinance, BMW, and Nestle) and has over 25,000 platform members. Nokia, a Finnish multinational telecommunications and information technology company, built its own platform—IdeasProject—for their brand enthusiasts (i.e., their consumers and developers). Similar to Atizo, IdeasProject facilitates participants' idea generation for applications for mobile platforms. Similar to any other brand community, IdeasProject is not geographically bound and is based on a structured set of social relationships among admirers of the brand (Muniz & O'Guinn, 2001). Nokia has attracted more than 23,000 members, and with this community, it aims to find the best ideas for future Nokia applications on various subjects (e.g., health, games, and infotainment) and develop them into real applications.

Both platforms allow participants to submit their ideas in a similar structure and to collaborate with other participants through comments; they also offer monetary rewards for the best ideas. However, unlike IdeasProject's participants, who are expected to be mostly Nokia mobile phone users, most Atizo participants do not have a strong relationship with the more than 200 brands that post a challenge.

#### **4.2 Data collection**

To test our model, the platform managers were requested to randomly distribute a web-based questionnaire to their platform members. By the time the survey was closed, a total of 113 responses (87% males; mean age = 41) had been received from Atizo, representing a good response rate (18%). These participants were mainly from Germany, Austria, and Switzerland, and most were full-time employees or freelancers; the rest were students. The Nokia survey generated 209 responses (98% males; mean age = 25) with the same response rate (18%). These respondents were mainly from India, the United States, and Finland. As expected, most of the participants (91%) were Nokia mobile phone users.

All constructs were measured using multiple-item scales that were adapted from previous studies and modified for use on the crowdsourcing platforms. All items were measured using a five-point Likert-type scale (1 = strongly disagree; 5 = strongly agree). The measurement of the TPB constructs, including attitude, subjective norm, perceived behavioral control, and intention, were based on scales developed by Ajzen and Fishbein (1980). The scales to measure enjoyment and reward were adapted from Amabile, Hill, Hennessey, and Tighe (1994); reputation was adapted from Wasko and Faraj (2005); networking was adapted from Wu (2009); and intellectual stimulation was adapted from Pedroni, Bay, Oriol, and Pedroni (2007). The set of constructs and their corresponding items are described in Table 1 in the Appendix.

The survey was conducted anonymously; therefore, factual participation data could not be collected. However, online and anonymous settings of the survey minimized the case of social desirability. Additionally, no significant differences were found between the early and late respondents, suggesting that nonresponse bias was not present. To further strengthen the validity of self-reported responses, short direct questions were asked and avoided statements that could lead to acquiescence. A pre-test was conducted, and unrelated questions were randomized to avoid a question-order bias. Questions for participation were also rephrased and posed in three questions as a means to increase respondents' question response accuracy.

### **4.3 Research method**

Once the data were collected online, the hypotheses were tested by the partial least squares (PLS) structural equation analysis. As a structural equation modeling (SEM) technique, PLS estimates the direct, indirect, and interaction relationships among these constructs (Wood, 1982). The PLS algorithm has been increasingly accepted and is widely used in motivation research and information systems (IS) research with the TPB and TRA models (Urbach & Ahlemann, 2010). The statistical program SmartPLS (Chin, 1998; Ringle, Sarstedt, & Mooi, 2010) was used to perform the structural modeling analysis. Many studies of the TPB have validated the use of SEM, making the use of SmartPLS in our analysis highly appropriate (Ringle et al., 2010). A test of mediation (Baron & Kenny, 1986) was also conducted using bootstrapping in SmartPLS.

## **5 Results**

### **5.1 Measurement validation**

To assess the validity of our measurement model, content validity, discriminant validity, and internal consistency were assessed using the square root of the average variance extracted (AVE), AVEs, loadings, Cronbach's alpha, and composite reliability, which presented greater value than the benchmarks. (See Tables 2 and 3 in the Appendix.) Content validity was established between the items and the existing literature by our interviews and a pre-test. The square roots of all AVEs were above .78, which were much larger than all the cross-correlations (See Table 2 in the Appendix). AVEs were also above 0.61, which are well above the acceptability value of .50 (See Table 3 in the Appendix). Composite reliability values were greater than .80, ranging from 0.84 to 0.93 (Fornell & Larcker, 1981). Cronbach's alpha values were also checked for the internal consistency of the instruments' values. Internal consistencies of all variables represented an acceptable reliability, ranging from .63 to .93. All items loaded well for their respective factors and had much higher values than all the cross-loadings for the reflective latent variables. The loadings of the respective constructs reflect the adequacy of the measures and are presented in Table 1 in the Appendix. Therefore, the convergent validity, discriminant validity, and reliability requirements were met. With reliable and valid instruments and an acceptable level of multicollinearity, the proposed hypotheses were tested.

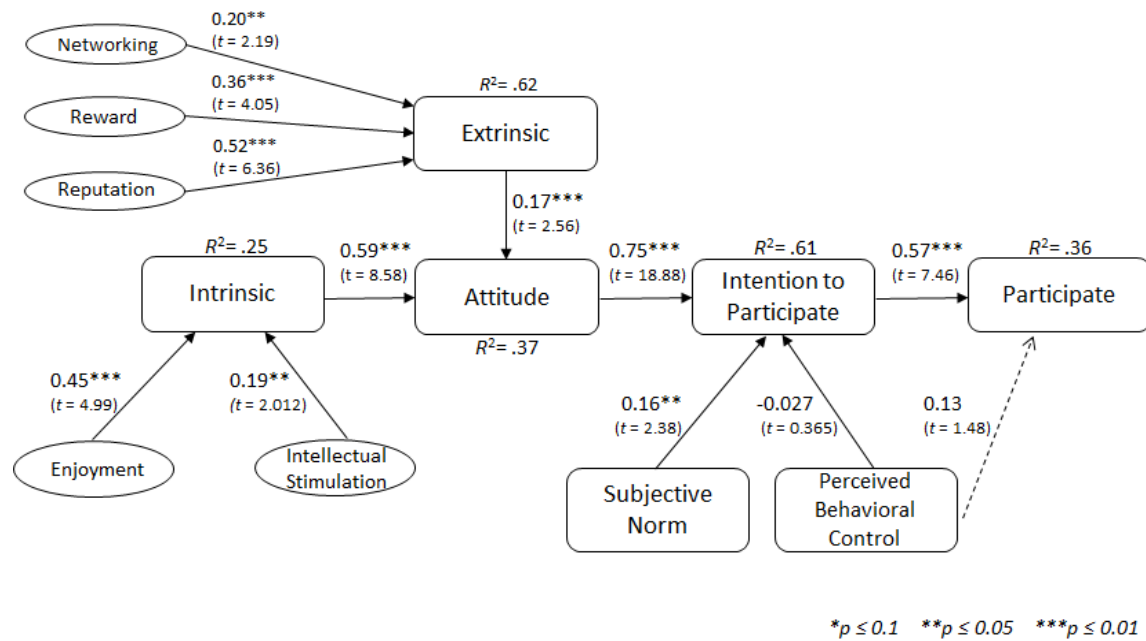
### **5.2 Structural model**

The objective of this study was to broaden the literature on crowdsourcing platforms' participation by focusing on utilitarian, hedonic, and social motives and social factors. This research's main strength is its exploration of two common crowdsourcing communities with different types of hosts at an individual level. Thus, it provides a high degree of external validity to the findings compared to prior research.

The results of this research demonstrate that cognition models can enhance understanding the factors that determine an individual's intention to participate in crowdsourcing communities. The additional intrinsic and extrinsic predictor variables each amplified the prediction of individual's intention to participate in crowdsourcing communities. Quality indicators for Atizo and Nokia models represent a well-explained model ( $R^2$  of Atizo = .36;  $R^2$  of Nokia = .22). Likewise, the paths for motives in Atizo and Nokia models are highly significant. Thus, the findings strongly support the appropriateness of using an augmented TPB model in this novel context and confirm the predictive validity of

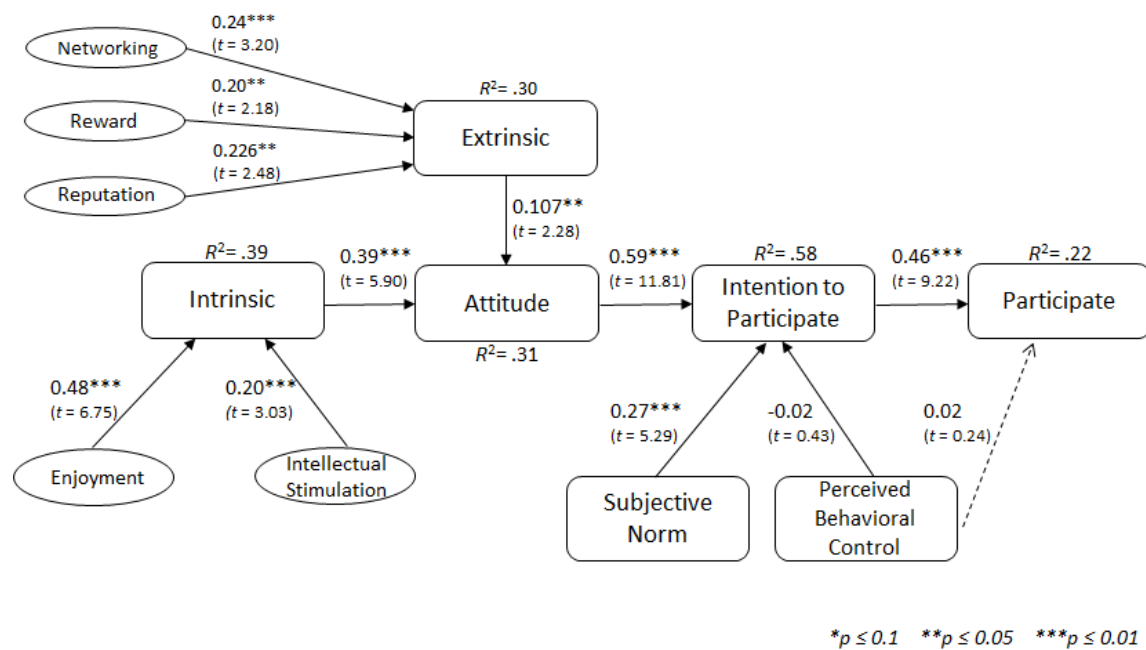
intentions to understand the determinants of participation in crowdsourcing communities for their sustainability.

The results of the structural equation modeling of the models presenting the interrelations among constructs are depicted in Figure 2 (Atizo) and Figure 3 (Nokia) and detail the factor loadings and  $R^2$ s as a PLS result directly in the path models.



**Figure 2.** Analysis results for participating in a third-party innovation intermediary (Atizo)





**Figure 3.** Analysis results for participating in a brand-initiated crowdsourcing platform (Nokia)

The results of the models (shown in Figures 2 and 3) show both intrinsic and extrinsic motives have a positive correlation with attitude toward behavior, but intrinsic motives (0.59 for Atizo; 0.39 for IdeasProject) dominate extrinsic factors (0.17 for Atizo; 0.11 for IdeasProject). Further, for testing significant differences for the coefficients of intrinsic and extrinsic paths, a z-test was conducted. This resulted in significant differences: z-scores of 2.58 (cumulative  $p$  value = .995, significant at  $p < .01$ ) for Atizo and 2.75 (cumulative  $p$  value = .997, significant at  $p < .01$ ) for Nokia. The substantial effect of the practical relevance of the variable in explaining the target construct was also checked by f-square effect sizes of intrinsic and extrinsic variables on attitude. Respectively, the intrinsic variable had a larger effect of 0.54 for Atizo and 0.24 for Nokia on attitude than the extrinsic variable, which had an effect of 0.20 for Atizo and 0.21 for Nokia (Cohen, 2013). These results suggest that in the crowdsourcing platform context, favorable individual attitudes toward participation are influenced by hedonic motives, rather than by expectations of extrinsic motives. Even though H1c and H2b were supported for both Atizo and IdeasProject because attitude is more favorable with respect to the greater intrinsic and extrinsic motives, H3 was rejected due to the finding that intrinsic motives will have a greater positive impact than extrinsic motives on the participation intention of community members. This finding contrasts sharply with the established incentives in most presently available platforms. Thus, this study provides new insights for motivational perspectives.

A positive relationship of reputation and rewards with extrinsic motives was found, and that supported H1a and H1b. Among the anticipated extrinsic motives, clear differences were noticed between the two communities. For instance, for the third-party community (Atizo), reputation and reward are the two leading motives, having path coefficients of 0.52 and 0.36, which are higher than the networking (0.20) motive. However, in the case

of the brand-initiated community (Nokia) model, networking (0.24) is the leading motive, followed by reputation (0.23) and reward (0.20).

In hypothesis H2a, this study proposed that individuals may naturally participate more with the increased levels of enjoyment through the act of participation. Despite the utility maximization perspective, H2a is still supported. Moreover, findings show social motives of both intellectual stimulation and networking are important determinants of corresponding motives in both types of communities. Thus, H2c and H1d are supported. Unlike findings in prior studies (e.g., Wasko & Faraj, 2000), this study found individuals actually use such platforms to build networks; therefore, it seems the potential social aspects of these platforms have been underestimated.

Regarding the TPB constructs, the results of the models demonstrate attitude dominates subjective norms, and subjective norms and attitude increase participants' intentions. Comparing the impact of attitude versus subjective norms showed attitude's marginal influence (0.75 for Atizo; 0.59 for IdeasProject) on the intention to participate is higher than the marginal influence of subjective norms (0.16 for Atizo; 0.27 for IdeasProject).

Further, the difference between the coefficients of attitude and subjective norms was also tested and resulted in z-scores of 3.82 (cumulative  $p$  value = .999; significant at  $p < .01$ ) for Atizo and ( $p$  value = .985; significant at  $p < .05$ ) for Nokia. Likewise, the f-square effect sizes of attitude and subjective norm variables on intention were assessed. Respectively, attitude had a larger effect on participation in both models: 1.40 for Atizo and 0.61 for Nokia; however, subjective norm had a smaller effect of 0.18 for Atizo and 0.27 for Nokia (Cohen, 2013). Thus, these results support H4, H5, and H6 for both cases. In the case of perceived behavioral control, the finding was insignificant for both communities (H7). Despite the criticisms of the intention-behavior gap, our study resulted in a high predictive validity of intentions with a positive influence on behavior; this supported H8 for both cases, despite the former contradictory results.

The results of the mediating effect show the indirect effects of attitude and subjective norms on behavior via intention are positive and significant ( $p < .01$ ). Thus, the results of our test validate that intention to participate mediates the impact of attitude and subjective norm for both models (omitted for PBC). Moreover, the TPB posits that the effects of behavioral, normative, and control beliefs on intention and behavior are hypothesized to be mediated through a higher order of attitude, subjective norm, and PBC factors, respectively. Testing for this in both models presented support for the partially mediating role of attitude for both intrinsic and extrinsic values on intentions, which accords with the mediating role of attitude specified in the TPB. Only enjoyment and intellectual stimulation have a significant indirect effect on attitude in the case of Atizo (the third-party innovation intermediary) model. However, the results for Nokia (the brand-initiated crowdsourcing model) validated that intrinsic value mediates the impact of enjoyment, and intellectual stimulation and extrinsic value mediate the impact of all extrinsic motives on attitude (omitted for reputation).

## **6 Discussion**

### ***6.1 Summary of findings***

The results of this research demonstrate that although motives' impact on attitude varies depending on the type of community, the impact of the rest of the factors, such as norms and attitude, are alike for the individual's intention to participate in these platforms. This

serves one of the aims that differentiate the two communities in terms of personal factors. However, there are a number of commonalities in brand-initiated crowdsourcing and third-party-initiated crowdsourcing communities. For instance, despite the two platforms' differences, networking is prioritized as a social motive rather than intellectual stimulation in both platforms. This can be due to the activity type—ideation—which has a less challenging nature compared to open source software's character. The results also suggest that enjoyment has a positive correlation with attitude in both community types, despite the utility maximization perspective. This confirms the findings of previous studies of open source software and social psychology literature that have acknowledged the importance of perceived enjoyment in representing intrinsic motivation (Amin, Baba, & Muhammad, 2007; Venkatesh, 1999).

However, when comparing intrinsic and extrinsic motivations, prior studies have reported contradictory results. Some found support for the superiority of extrinsic motives over intrinsic motives (e.g., Antikainen & Vääätäjä, 2008; Wasko & Faraj, 2005), and others have presented conflicting results (e.g., Schulz & Wagner, 2008; Zheng et al., 2011). In our crowdsourcing context, intrinsic and extrinsic motives were significant antecedents of attitudes that hold both cognitive and affective factors, but the superiority of extrinsic motives was not found as present as expected. Our empirical findings clearly suggest an individual's attitude toward participation is largely driven by anticipated intrinsic motives in both third-party-initiated and brand-initiated crowdsourcing contexts, thus confirming self-determination theory. Yet, this contradicts some prior studies (e.g., Verhagen et al., 2012) and could be explained by the nature of the task types. Ideation tasks can be perceived as intrinsically challenging and enjoyable compared to other types of tasks, such as micro-tasks (e.g., translation or transcription). These tasks would enhance creativity and intellectually stimulate individuals. Additionally, insufficient monetary rewards provided for such tasks instill rather small extrinsic motivation. Such small rewards lower the impact and competitive nature of these platforms, especially considering tasks on brand-hosted platforms, which often improve products and services aimed at meeting customers' needs. Likewise, on brand-hosted platforms, reputation might not be as important as in open source communities because the tasks do not require high skill sets. Thus, people might choose to participate in a less extrinsically motivating task in order to receive intrinsic benefits, which could tend to override the effect of the task's extrinsic motivations.

The reinforcement theory of motivation holds that an individual's behavior, such as work performance, or motivation is based on the consequences of direct extrinsic factors, such as payment (Skinner, 1969). Despite the contradictory results of prior studies, this study concluded that monetary rewards do increase participation. This is consistent with economic theories suggesting that if a behavior is rewarded, more of that behavior is shown (Frey, 1992). Studies on crowdsourcing contests in this field have also shown that with increased reward size, participation increases (e.g., DiPalantino & Vojnovic, 2009; Terwiesch & Xu, 2008) and participants' engagement upsurges (e.g., Difallah, Catasta, Demartini, Ipeirotis, & Cudré-Mauroux, 2015). Still, in both communities, results showed the monetary reward amounts to be rather inferior, especially considering the amounts were characterized as "pocket money." Therefore, insufficient monetary rewards could be one underlying reason. This supports Yang, Chen, and Pavlou (2009), who suggested by increasing the size of the reward, platforms can restore the effectiveness of monetary rewards.

In terms of cognitive determinants of participation, the subjective norm construct is found to be a significant variable in the development of people's intentions, with loadings of 0.16 (Atizo) and 0.27 (Nokia), despite the prior contradictory results (e.g., D. Lee et al., 2011; Zhou, 2011). The survey results on both platforms also indicated attitude has a greater effect than subjective norms on intention. This result is in accordance with prior research on information systems (Ajzen, 1991). There could be several reasons for the lower influence of subjective norms on intentions compared to attitude's influence. First, this influence may be due to the absence of previous experience with shared norms in online environments. Second, geographical dispersion can be expected to lead to differences in norms. Because the Internet community comprises diverse users, lack of prior knowledge among participants may reduce the impact of these norms. Finally, people do not necessarily conform to the same social norms in the real and virtual worlds, and the impact of social norms may also have different manifestations in virtual worlds. These factors may explain why attitude dominates subjective norms in the crowdsourcing communities.

The investigation of two crowdsourcing platforms with different host types for ideation challenges has also revealed the major differences in determinants of participation. Differences in types of motives emerged as a critical factor in explaining why the same type of participation is triggered differently in brand-hosted crowdsourcing and third-party hosted crowdsourcing communities. First, even though an individually driven intrinsic motive (enjoyment) has more influence than a socially driven intrinsic motive (intellectual stimulation) for both communities, the weight of intrinsic motives alters other motives comparatively in the two communities. For instance, although enjoyment is the most important intrinsic motive for brand-hosted communities, this is not the case for the third-party hosted communities, even if it was expected to be in the prior literature. Second, intellectual stimulation is the contradictory motive between the two communities, possibly owing to the specific knowledge and focus required (i.e., mobile technology) in a brand-hosted platform. Nokia challenges its participants within the mobile technology domain, but Atizo has a broader subject coverage that involves various industries and expertise. This does not necessarily improve personal development or require expertise on a specific matter that might lead to greater intellectual stimulation.

The order of importance of the anticipated extrinsic motives also varies within the two types of communities. For instance, networking is one of the most important motives in the brand community (Nokia), but members of the intermediary group (Atizo) prioritize reputation. In the brand-hosted community, members are mainly concerned about their visibility in network building, not only to other members but also to the company itself. For instance, Nokia's employees are also members of the community; so, increased networking on such platforms can improve their visibility as an employee (e.g., lead to promotion), or it can increase potential future employment for others who are not brand employees. Likewise, reputation is a superior motive for third-party hosted community members who seek to build expertise and foster the professional aspect of membership. Thus, for third-party-hosted community members, community is more important than the platform owner is; however, for brand-initiated community members, the host company takes priority for potential future returns.

The comparison also suggests brand-hosted crowdsourcing communities prioritize social motives more than third-party-hosted intermediary communities. This can be related to activities based on host-type that generate social capital for the community, which prior

studies (e.g., J. Kim et al., 2015) have found. For instance, participants of IdeasProject can easily associate the outcomes of their actions with updated products and services because most of them are also brand customers.

## ***6.2 Theoretical contributions***

The present findings have especially important theoretical implications. Unlike prior studies of online communities that have analyzed participation intentions independently from either a motivational perspective (e.g., Krishnamurthy, 2006) or a social-psychological viewpoint (A. J. Kim, 2000), this study focused on crowdsourcing community participation from the combined perspective of motives and cognitive determinants. Using an augmented theory of planned behavior model that embraces internal factors, this study also had the opportunity to analyze users' behaviors from a motivational perspective. Apart from providing an additional scope for research on the TPB with hedonic and utilitarian motives, the analysis of the social motives presented another measurement benefit. Therefore, the first contribution of this study is the combination of a social cognition model with hedonic, social, and utilitarian motives that is empirically applicable in this context.

The second theoretical contribution is the insight that can be drawn from a comparative study. Most prior research on participation behavior has focused on a single type of community; therefore, it lacked an ability to make comparisons. Although some research has found consistent results for some relationships in the constructs, a comparative analysis allowed us to reveal the effects of community host types, domain differences, and diverse mechanisms related to participation behavior in crowdsourcing communities. The present findings suggest prior findings from the crowdsourcing community literature should not be taken for granted.

## ***6.3 Implications for practice***

Owners of crowdsourcing platforms are interested in attracting members and retaining participants in their crowdsourcing communities, not only to sustain their platforms but also to attract more organizations within a larger community. Thus, the findings of this study provide important insights for platform owners and system developers to further improve participation rates.

This research emphasizes that extrinsic rewards, such as money, are not necessarily primary motives for participation. Depending on the host type, to promote participation in their crowdsourcing communities, platform owners may need to develop mechanisms to support other motives. For instance, perceived enjoyment is an important motive for brand-hosted crowdsourcing communities, by knowing this, hosts can enhance an individual's experience not only by question type or degree of difficulty but also through visual quality (i.e., graphic design), platform structure, and ease of participation process, which typically enhances the platform's usability.

Platform owners and system developers can also design and control the nature of the relations among users through building the platform's structure accordingly. For example, brand-hosted communities prioritize social motives; therefore, owners and developers can implement various communication channels in the platform to enable interactions, collaborations, and networking among members for relationship building. Some crowdsourcing communities allow participants to add other users as "friends," similar to Facebook, to enhance its social aspects and encourage networking and collaboration.

Being able to view individual's connections can influence the development of social capital. Specifically, the content that participants share and exchange through comments and messages promote relationships. Connecting participants through private messaging or comment tools can enable networking and encourage them to collaborate. These tools can also establish online norms and foster coordination for a common goal—to influence the development of social capital (R. Chen et al., 2016). Thus, the more interactive the participation process is through comments, ratings, and notifications, the more likely participants will communicate and augment the social benefits.

Hosts can determine the type of content, tools, communication structure, and task process embedded in the communities by providing either related features or publicly visible signals (Kane, Alavi, Labianca, & Borgatti, 2014). Because reputation is an important determinant of participation in third-party-initiated crowdsourcing communities, certain features can be implemented to build and augment reputations on the digital profile itself. This could include publicly announcing winners and updating their profiles with this information; allowing content contributions to others' profiles, such as recommendations on LinkedIn; or sharing the number of contributions members have made. Similarly, digital profiles that reflect one's online community identity can be used to associate participated content with a participant's profile and can present the participant's subject matter expertise and role as a topic moderator. Eventually, this influences interactions with others and also their perceptions.

Likewise, spotlighting winners within platform forums, in newsletters, or through online ratings (extending the view of Dellarocas, 2005, in our setting) can build reputations. Through ratings (e.g., thumbs-up/-down rating system), ideas can become popular and draw attention to and, eventually, enhance the reputation of the participant. With such visible signals, individuals can build their credibility, and this also assists companies in the idea selection and filtering process.

#### ***6.4 Limitations and future research directions***

Despite efforts to increase its rigor, this study is subject to certain limitations. First, it was conducted on two types of web-based platforms; so, to some extent, this may limit its level of generalizability. Even though these two platforms might have unique features that make them different from other crowdsourcing platforms, their platform design features and challenges resemble the majority of other large well-known platforms, such as InnoCentive. Therefore, the findings' interpretations should be cautiously generalized to other web-based platforms.

Second, randomly selected participants may possess some characteristics that are not representative of the overall population. The respondents were mainly from Germany, Austria, Switzerland, India, the United States, and Finland; therefore, generalizability to other countries might be limited due to cultural differences in members' behaviors on such platforms. Thus, future studies may extend this research by studying different type of platforms, particularly larger and international ones, to enhance the robustness of the findings. Another key future research direction is to investigate how brand-related factors such as brand loyalty, external pressure level changes, and participants' situational factors (e.g., moods [Zhuang & Gadiraju, 2019]) at any given time can affect intentions.

Third, self-reporting bias is a common issue in behavioral research, even though the TPB model's explicatory power is high when using self-reported data. Future studies could use

actual participation data to eliminate this potential shortcoming. Gender bias in sampling could also be a limitation. However, considering the underrepresentation of women in online communities (Vasilescu, Capiluppi, & Serebrenik, 2013), it is not certain if the gender ratio is a misrepresentation of the population as a whole.

In addition, cluster analysis can be used to create homogenous groups and evaluate the differences in motivation of each cluster to achieve more accurate implications. Thus, further research is required to examine various groups' motives. Likewise, considering the interaction between the TPB constructs and between extrinsic and intrinsic motives could also be possible directions for future studies.

## 7 Conclusion

Neoclassical economic theory portrays individuals as utility maximizers with a given set of preferences (Smelser & Swedberg, 1994). However, recently, the added importance of behavioral aspects and social effects within online communities has been increasingly emphasized. This study has explored the behavioral aspects of hedonic, social, and utilitarian motives and intentions for participation in two types of crowdsourcing communities for ideation tasks. It also represents a novel contribution to the literature by providing an opening for a holistic understanding and dissemination of the competitive innovation concept. To do that, the augmented model that embraces both social-psychological factors and psychological theory of motivations was tested for two platforms with different host types. Findings showed that differences in motives, other than cognitive factors, emerged as critical elements in explaining why the same type of participation is triggered differently in two types of crowdsourcing communities.

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## Appendix

**Table 1.** *Scale Items with Factor Loadings*

Construct	Measurement items	Loadings	
		Atizo	Nokia
<b>Enjoyment</b> (Amabile et al., 1994)	EN1: For me, to participate in Atizo challenges /IdeasProject is pleasant.	0.85	0.86
	EN2: I expect that I will enjoy solving problems and generating new ideas in Atizo challenges/ IdeasProject.	0.91	0.84
<b>Intellectual Stimulation</b> (Pedroni et al., 2007)	IS1: I participate in Atizo challenges/IdeasProject for the intellectual challenge of solving problems.	0.89	0.90
	IS2: Topics of Atizo challenges/IdeasProject matches with my personal interests.	0.82	0.89
<b>Reward</b> (Amabile et al., 1994)	RE1: I expect to receive some money for my participation in Atizo challenges/IdeasProject.	0.80	0.82
	RE2: I will receive some rewards for my participation in Atizo challenges/IdeasProject.	0.82	0.84
	RE3: I expect to win an award through participating in challenges of Atizo challenges/IdeasProject.	0.79	0.81
<b>Networking</b> (Wu, 2009)	N1: I expect to get interesting contacts through participating in innovation contests.	0.85	0.94
	N2: My participation will increase my networking with other members who have common interests.	0.91	0.87
<b>Reputation</b> (Wasko & Faraj, 2005)	RP1: Participating in Atizo challenges/IdeasProject can increase my reputation.	0.93	0.90
	RP2: Participating in Atizo challenges/IdeasProject can strength[en] my position and visibility.	0.82	0.85



<b>Subjective Norm</b> (Ajzen & Fishbein, 1980)	SN1: Most people that I know participate in Atizo/IdeasProject.	0.75	0.75
	SN2: Most people value participation in Atizo/IdeasProject as an important issue.	0.87	0.84
	SN3: Most people whose opinion I value think that participating in Atizo/IdeasProject is important.	0.91	0.87
<b>Attitude</b> (Ajzen & Fishbein, 1980)	AT1: For me, to participate in Atizo/IdeasProject was good,	0.80	0.83
	AT2: For me, to participate in Atizo/IdeasProject was beneficial.	0.79	0.83
	AT3: I have a positive attitude towards participating in Atizo/IdeasProject.	0.77	0.79
<b>Perceived Behavioral Control</b> (Ajzen & Fishbein, 1980)	PBC: My organization allows me to participate in Atizo/IdeasProject.	1.00	1.00
<b>Participation</b>	PAR1: How often do you participate in Atizo/IdeasProject?	0.87	0.91
	PAR2: How often do you check/log in into Atizo/IdeasProject?	0.94	0.91
	PAR3: How often do you come up with a new idea in Atizo/IdeasProject?	0.91	0.89
<b>Intention</b> (Ajzen & Fishbein, 1980)	IP1: I intend to provide my ideas in Atizo/IdeasProject on a regular basis.	0.93	0.88
	IP2: I plan to participate more in Atizo/IdeasProject.	0.63	0.81
	IP3: I intend to participate more in Atizo/IdeasProject.	0.92	0.87

**Table 2. Discriminant Validity**

<b>Platform Atizo</b>	<b>AT</b>	<b>EX</b>	<b>IP</b>	<b>IN</b>	<b>N</b>	<b>PBC</b>	<b>PAR</b>	<b>RE</b>	<b>SN</b>	<b>IS</b>	<b>EN</b>	<b>RP</b>
Attitude (AT)	0.79											
Extrinsic (EX)	0.21	1.00										
Intention (IP)	0.77	0.11	0.84									
Intrinsic (IN)	0.61	0.26	0.47	1.00								
Networking (N)	0.29	0.27	0.25	0.43	0.88							
Perceived Behavioral Control (PBC)	0.14	0.18	0.16	0.13	-0.05	1.00						
Participation (PAR)	0.55	0.10	0.59	0.41	0.17	0.22	0.91					
Reward (RE)	0.24	0.64	0.26	0.29	0.43	0.30	0.22	0.81				
Subjective Norm (SN)	0.12	0.11	0.23	0.17	-0.04	0.54	0.20	0.26	0.85			
Intellectual Stimulation (IS)	0.36	0.57	0.27	0.23	0.13	0.18	0.26	0.48	0.11	0.85		
Enjoyment (EN)	0.67	0.07	0.48	0.47	0.18	0.05	0.46	0.05	0.10	0.11	0.88	
Reputation (RP)	0.18	0.71	0.11	0.27	0.23	0.18	0.13	0.54	0.16	0.60	0.07	0.88
<b>Platform Nokia</b>	<b>AT</b>	<b>EX</b>	<b>IP</b>	<b>IN</b>	<b>N</b>	<b>PBC</b>	<b>PAR</b>	<b>RE</b>	<b>SN</b>	<b>IS</b>	<b>EN</b>	<b>RP</b>
Attitude (AT)	0.84											
Extrinsic (EX)	0.47	1.00										
Intention (IP)	0.73	0.47	0.86									
Intrinsic (IN)	0.51	0.36	0.54	1.00								
Networking (N)	0.44	0.43	0.49	0.49	0.90							
Perceived Behavioral Control (PBC)	0.14	0.11	0.13	0.04	0.16	1.00						
Participation (PAR)	0.46	0.30	0.46	0.35	0.34	0.07	0.90					
Reward (RE)	0.65	0.47	0.67	0.51	0.52	0.30	0.40	0.82				
Subjective Norm (SN)	0.52	0.30	0.57	0.34	0.41	0.25	0.37	0.58	0.81			
Intellectual Stimulation (IS)	0.70	0.37	0.65	0.49	0.43	0.20	0.43	0.79	0.52	0.90		
Enjoyment (EN)	0.69	0.51	0.68	0.60	0.57	0.13	0.43	0.57	0.43	0.60	0.85	
Reputation (RP)	0.76	0.46	0.68	0.50	0.43	0.27	0.38	0.72	0.56	0.67	0.64	0.88

Note: All correlations are significant at  $p = 0.05$ .

The diagonal rows are the square roots of the average variance extracted for the constructs.

**Table 3. Reliability and Convergent Validity**

	Atizo				Nokia			
	Composite Reliability	Cronbach's Alpha	AVE	rho_A	Composite Reliability	Cronbach's Alpha	AVE	rho_A
<b>Attitude</b>	.83	.70	.62	.71	.87	.78	.70	.79
<b>Extrinsic</b>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>Intention to Participate</b>	.87	.78	.70	.83	.89	.82	.73	.82
<b>Intrinsic</b>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>Participation</b>	.93	.89	.82	.91	.93	.89	.81	.90
<b>Subjective Norm</b>	.88	.81	.72	.88	.85	.74	.66	.74
<b>Reward</b>	.85	.73	.65	.74	.86	.76	.67	.76
<b>Reputation</b>	.87	.71	.77	.79	.87	.70	.77	.72
<b>Networking</b>	.87	.72	.78	.75	.90	.78	.81	.85
<b>PBC</b>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>Enjoyment</b>	.87	.71	.78	.74	.89	.75	.80	.75
<b>Intellectual Stimulation</b>	.84	.63	.73	.65	.84	.72	.65	.75