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# CONTINUANCE INTENTION IN CROWDSOURCING PROCESSES

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# CONTINUANCE INTENTION IN CROWDSOURCING PROCESSES

*Complete Research*

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## **Abstract**

*With the growing popularity of Crowdsourcing (CS), companies are developing different strategies to tap into the creativity of the crowd. Some of these strategies imply the long-term involvement of communities of external individuals. Since participation in CS is voluntary, it is important to understand the determinants of participation. Several studies exist that investigated the motivations of participants in CS initiatives. These studies, however, did not make distinction between people who participate only once and people who after the first experience intend to participate again. This research attempts to explore the determinants of repeated participation, critical for the success of long-term CS strategies. We investigate the impact of intrinsic and extrinsic motivations on the intention continue for participants in CS initiatives.*

*To address this objective, a survey involving individuals, who have participated at least once in CS initiatives, has been conducted. Hierarchical regression analysis has been used to test the hypotheses.*

*The findings demonstrate that intrinsic motivations impact on the intention to continue for participants in CS initiatives. The impact of extrinsic motivations (i.e. monetary rewards and reputation) was found to be not significant. As a consequence, companies willing to adopt long-term CS strategies need to leverage intrinsic motivations in order to involve communities of external individuals in their innovation processes.*

*Keywords: Crowdsourcing, Open Innovation, Motivation, Continuance Intention, Broadcast Search.*

## Introduction

The word Crowdsourcing (CS) (Howe, 2006), refers to an effort, generally enabled by web-based tools, to leverage the expertise of a global pool of individuals and organizations to develop and implement creative solutions to innovation challenges as quickly and cost-effectively as possible (Marjanovic et al., 2012).

CS includes a variety of practices very different from each other. This study focuses on "broadcast search", that is, an organization, called "the seeker", broadcasts predefined innovation challenges to unknown external actors, called "solvers" (Jeppesen and Lakhani, 2010). Any individual can participate in the challenge and try to solve the proposed innovation problem (Corvello and Iazzolino, 2013).

The popularity of the CS approach is steadily growing among both scholars and practitioners. This is proved, for example, by the success of platforms like Innocentive, one of the most popular intermediaries for innovative challenges: from 2005 to 2011 Innocentive has involved over 200.000 solvers in more than 200 countries (Marjanovic et al. 2012).

Organizations that want to exploit CS in any form or intensity may resort to specific organizational strategies that differ among themselves according to the duration of outsourced activities or, in any case, according to the duration of the relation between seeker and solver (Keinz et al. 2012). Understanding what motivates individuals to repeatedly participate in CS activities is essential for businesses that decide to adopt long-term strategies.

In the literature several studies exist that have investigated the motivations of individuals to participate in CS initiatives (Smith et al. 2013; Albors et al. 2008; Kazai et al. 2012; Brabham 2009; 2010; 2012; Mola and Carugati, 2012). However, the motivating factors associated with the intention to continue participating in CS initiatives can be different from the motivations for participating only once. Indeed, Keinz et al. (2012) observe that companies adopting short-term CS strategies make use of monetary rewards to motivate their solvers' participation. Companies that adopt long-term strategies try to facilitate the formation of solvers' communities, which are collaborative rather than competitive and based on relational rather than formal contracts (Lakhani and Wolf, 2005; Cricelli and Grimaldi, 2010).

The problem of what motivating factors affect solvers' intention to continue participating in CS initiatives has not been specifically addressed in the existing literature.

Hence, the aim of this study is to investigate the factors that positively influence the intention to continue participating in CS processes over time. In particular, this research investigates the effects of intrinsic and extrinsic motivational variables like enjoyment, reputation, monetary rewards, capacity development, trust. Knowing the motivation for continued participation is important in order to suggest to managers what are the variables on which to focus in order to successfully involve external individuals in long-term CS activities.

## 1 Literature review

The variables considered in the research model (see fig. 1) were identified through a review of the literature on motivation to participate in CS activities (Smith et al. 2013; Albors et al. 2008; Kazai et al. 2012; Brabham 2009; 2010; 2012) as well as in similar contexts like virtual communities (Abfalter et al. 2012; Hoon Kim et al. 2009; Hsiu-Fen Lin 2008; Corvello et al. 2014), open source initiatives (Lakhani and Wolf 2005; Belenzon and Schankerman, forthcoming) and in general in open innovation contexts (Antikainen et al. 2010; Antikainen and Väätäjä 2008; Battistella and Nonino 2011).

The motivational factors are distinguished in intrinsic motivations and extrinsic motivations (Lakhani & Wolf, 2005; Von Hippel, 2001). Many times the two categories of motivators interact so that the extrinsic motivations affect the intrinsic ones and vice versa (Deci et al. 1999).

In this research the motivational factors are considered independent variables while the intention to continue is the dependent variable.

## 1.1 Intrinsic motivations

*Enjoyment* (Brabham 2012, 2010, 2008; Antikainen and Vääätäjä 2008; Kazai et al. 2012; Antikainen et al. 2010) is the pleasure and personal enjoyment that comes from doing what is pleasing. It is often associated with the possibility to express creativity and/or artistic talent (Battistella and Nonino, 2011). The creativity of individuals is often unexpressed in the daily context of work. Participation in web-based activities, such as CS, allows exploiting the latent creative talent (Howe, 2008). We formulate the following hypothesis:

H1: the enjoyment of participation in CS initiatives significantly and positively affects solvers' intention to continue participating.

*Capacity development* is the opportunity to improve an individual's skills and abilities through participation in CS initiatives. In open communities the motivating power of the capacity development factor is considered especially relevant (Brabham, 2010). Participants have the opportunity to improve their skills through ongoing interaction with colleagues and continuous feedback from peers (Moody 2001; Raymond 1999; Wayner 2000). This interactive process improves both the quality of the results and the skills of the participants (Lakhani e Wolf, 2005). An individual that expects to learn from his/her participation in CS initiatives is expected to be motivated to repeat his/her participation. As a consequence we formulate the following hypothesis:

H2: perceived capacity development through participation in CS initiatives significantly and positively affects solvers' intention to continue participating.

Individuals invest time, talent and, in some cases, monetary resources in the resolution of a challenge. It is therefore necessary that the promoter of the CS activities proves to be reliable and it is immediately clear what its policies regarding the rights of the solver are. If this information is not clear a climate of distrust among the participants can arise. In this case the motivation to continue can be weakened. For this reason, the variable *trust* is of crucial importance in CS initiatives (Hoon Kim et al. 2009, Brabham, 2012).

H3: trust in the promoter of CS initiatives significantly and positively affects solvers' intention to continue participating.

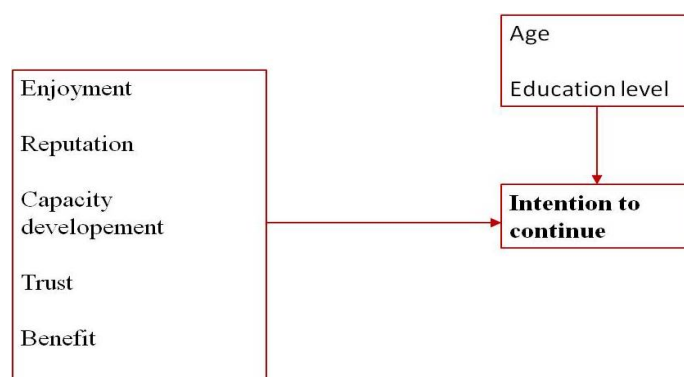


Figure 1. Research model

## 1.2 Extrinsic motivations

The desire to improve one's own *reputation* (Brabham 2012; Antikainen and Vääätäjä 2008; Kazai et al. 2012) is considered a professional extrinsic motivation. The enhancement of the reputation of contributors in open and collaborative innovation activities helps to improve the perception of the value of their work and skills in their colleagues' opinion (Battistella and Nonino, 2011). Reputation is a strong motivational factor because people want their contribution to be recognized; it represents the opportunity to be known by others as a person who possesses distinctive competences, for which to be respected and appreciated (Antikainen et al., 2010).

H4: the expectation to improve reputation significantly and positively affects solvers' intention to continue participating.

*Monetary benefits* are among the strongest extrinsic motivations to participate in CS initiatives (Brabham 2012; Antikainen et al. 2010; Kazai et al. 2012; Lakhani and Wolf, 2005). Monetary rewards also affect other motivational factors like enjoyment and interest in innovation (Antikainen and Vääätäjä 2008).

H5: perceived importance of monetary rewards significantly and positively affects solvers' intention to continue participating.

## 2 Research method

To test the proposed model we conducted a survey among individuals, which have participated in CS initiatives. A list of potential respondents was created using the names of participants made publicly available on popular CS platforms (including InnoCentive, IdeaConnection, Atizo and Open idea). The questionnaire was sent by email to 600 randomly selected individuals between October and November 2013. Sixty-four replies were obtained with a response rate of 10,67% but eight replies were rejected because incomplete or unreliable. The final sample included 56 complete questionnaires.

The characteristics of the sample are shown in table 1.

The questionnaire was developed on the basis of a review of the literature. Four researchers and two individuals with experience in CS reviewed the obtained questionnaire with regard to its clarity and the appropriateness of its measures. Only minor modifications were necessary.

The final questionnaire was structured in three sections: Personal information; Education, Employment & Professional Experience; Participation in CS initiatives. The main section for the purpose of this research is the section related to participation in CS, in which the variables considered in the research model were measured using a Likert scale with scores ranging from 1 to 5 (1= strongly disagree, 2= somewhat disagree, 3= neither agree nor disagree, 4= somewhat agree, 5= strongly agree). Consistent with prior studies (Antikainen, 2010; Zhao et al., 2013; Abfalter et al., 2012; Lin, 2008) we relied on respondents' perceptions of the measured variables.

To evaluate constructs reliability we used Cronbach's Alpha (Chronbach, 1951). After analyzing the data one of the items used to measure "monetary rewards" was dropped. The final values are shown in Table 2. All the variables have a value of Alpha above the threshold of 0.7.

The complete list of items and variables is shown in table 2.

The research model was tested using hierarchical multiple regression. Data analysis was conducted with the support of the statistical software SPSS (Bühl, 2012).

<b>Demographic characteristics</b>		<b>Frequency</b>	<b>%</b>
<i>Age</i>	20-30	9	<b>14%</b>
	31-40	18	<b>28%</b>
	41-50	20	<b>31%</b>
	51-60	7	<b>11%</b>
	61-70	20	<b>16%</b>
<i>Gender</i>	Male	54	<b>84%</b>
	Female	10	<b>16%</b>
<i>Education level</i>	Secondary School or lower	1	<b>1%</b>
	High School Diploma	5	<b>8%</b>
	University BA or equivalent	14	<b>22%</b>
	University Master or equivalent	23	<b>36%</b>
	University PhD or equivalent	21	<b>33%</b>
<i>Role/Job</i>	Undergraduate student	5	<b>6%</b>
	Graduate student	4	<b>8%</b>
	Employed with a fixed-term contract	8	<b>13%</b>
	Employed with a permanent contract	20	<b>31%</b>
	Unemployed	4	<b>6%</b>
	Self-employed	22	<b>34%</b>
	Other	1	<b>2%</b>
<i>Type of organisation</i>	Large Firm	3	<b>5%</b>
	Medium firm	2	<b>3%</b>
	Small firm	15	<b>23%</b>
	Government Research Organisation	2	<b>3%</b>
	Hospital	1	<b>2%</b>
	University and education	18	<b>28%</b>
	Private Research Organisation or Foundation	7	<b>11%</b>
	Other Government	2	<b>3%</b>
	Other	14	<b>22%</b>
	<i>Frequency of participation</i>	Daily	1
Couple of times a week		12	<b>19%</b>
Weekly		1	<b>2%</b>
Couple of times a month		7	<b>11%</b>
Monthly		12	<b>19%</b>
Less than once a month		31	<b>48%</b>

Table 1. Sample characteristics.

### 3 Results

As shown in Table 1, the sample of solvers is composed primarily of males (84%). The largest age group is between 41 and 50 years old (31%). Most respondents have a master's degree (36%) or a PhD (33%) and work as a freelancer (34%) or have a permanent contract (31%). Almost one third work in a university or educational institution (31%). Most of them have participated between 2 and 5 times to a CS initiative (31%) and with a frequency of less than once per month (48%).

Table 2 shows means and standard deviations for each variable.

Item	Measure	Mean	SD	$\alpha$
<b>Enjoyment</b>		<b>3,97</b>	<b>.15</b>	<b>.682</b>
E/CO1	Participating is one of the enjoyable things I love to do	4,031		
E/CO2	It is extremely engaging to participate	3,95		
E/CO3	I really like using my creativity in Crowdsourcing initiatives	4,14		
E/CO4	Participate in a Crowdsourcing initiative gives me a chance to do the jobs I feel I do best	3,78		
<b>Reputation</b>		<b>2,92</b>	<b>.059</b>	<b>.881</b>
R1	Recognition from others is my greatest reward	3,222		
R2	Participation in a Crowdsourcing initiatives helps me to obtain respect from other users	2,867		
R3	The appreciation from other actors is very important for me	3,025		
<b>Capacity development</b>		<b>3,77</b>	<b>.182</b>	<b>.857</b>
CD1	I learn many new things by participating in Crowdsourcing initiatives	3,968		
CD2	Experience from participating in Crowdsourcing initiatives greatly improves my ability	3,734		
CD3	Participation in Crowdsourcing initiatives gives me the feeling of significantly strengthening my skills	3,609		
<b>Monetary rewards</b>		<b>4,226</b>	<b>.166</b>	<b>.805</b>
B1	I don't care about money*	4,109		
B2	I want to get a monetary reward for my ideas	4,344		
B3**	In one way or another, I will make money from my participation in the Crowdsourcing initiatives	3,511		
<b>Trust</b>		<b>4,422</b>	<b>.132</b>	<b>.747</b>
T1	It is extremely important for me that broker / company that offers the challenge works reliably	4,515		
T2	It is very important to me that is clear to me what the policy of the rights to ideas or innovations is	4,328		
<b>Intention to continue</b>		<b>3,875</b>	<b>.248</b>	<b>.805</b>
IC1	I consider continuing to participate in Crowdsourcing initiatives as a very important action for myself	3,594		
IC2	I would like to participate again in a Crowdsourcing initiative	3,968		
IC3	I have the intention to participate again in Crowdsourcing initiatives	4,062		

\*This item was reverse coded.

\*\* This item was removed after the reliability analysis.

Table2. Mean for each measurement construct.

	1	2	3	4	5	6	7
1. Enjoyment	1						
2. Reputation	.370**	1					
3. Capacity	.328**	.457**	1				
4. Benefit	.001	.141	.262*	1			
5. Trust	-.010	.019	.117	.292*	1		
6. Education	.114	-.050	.287*	.247*	.254	1	
7. Age	.027	-.129	.056	-.004	.134	.401	1

\*\* Correlation significant at .01 level (two-tailed).

\* Correlation significant at the .05 level (two-tailed).

Table 3. Correlation matrix

In general, both intrinsic and extrinsic motivations were considered important, with reputation slightly less important than the others. Respondents expressed on average a moderately high intention to continue to participate in CS initiatives.

Table 3 shows the intercorrelations between the variables of the study. The correlations between dependent and independent variables are consistent with our hypotheses.

The research model was tested using hierarchical multiple regression. First we included the control variables (Model 1). Then we introduced the independent variables (Model 2). Table 4 shows the summary data for the hierarchical regression analysis.

Variables	Model 1	Model2
Education	-.019	-.204
Age	-.042	-.060
Enjoyment		.418**
Reputation		-.226
Capacity development		.287*
Monetary rewards		-0,06
Trust		.266*
$\Delta F$	.084	4,667
$\Delta R^2$	.003	.293
Sign. F Change	.920	.001

\*  $p < 0,05$ ; \*\*  $p < 0,01$

Table 3. Results of hierarchical regression analysis (dependent variable: intention to continue)



Model 1 could not explain the dependent variable effectively ( $R^2 = .003$ ;  $p > .05$ ). By introducing the independent variables we obtained a significant increase in the  $R^2$  ( $\Delta R^2 = .293$ ,  $p < .01$ ). Results for model 2 suggest that Enjoyment, Capacity development and Trust significantly and positively affect intention to continue. Hypotheses H1, H2 and H3 are supported by the data. The strongest effect was obtained for the variable Enjoyment ( $\beta = 0,418$ ;  $p < 0,01$ ). Relations of medium strength were found for Capacity development ( $\beta = .287$ ;  $p < .05$ ) and Trust ( $\beta = .266$ ;  $p < .05$ ). Surprisingly none of the considered extrinsic motivating factors was found to affect intention to continue significantly: neither monetary rewards ( $\beta = -.06$ ;  $p > .05$ ) nor reputation ( $\beta = -.226$ ;  $p > .05$ ) have a statistically significant impact on intention to continue.

## 4 Discussion and Conclusions

With the increasing popularity of crowdsourcing, firms are developing different strategies to exploit the advantages it provides. Some of these strategies imply the medium-to-long-term involvement of communities of solvers. It is important to understand what factors motivate individuals to repeat their participation in CS initiatives. This study considered the impact of both extrinsic (i.e. monetary rewards and reputation) and intrinsic (i.e. enjoyment, capacity acquisition, trust) motivations on the solver's intention to continue participating in CS initiatives.

The results of this study add to our theoretical understanding of CS by clarifying the role of different motivating factors on the intention to continue. Through the statistical analysis conducted it has been shown that intrinsic motivators are effective predictors of the intention to continue. Enjoyment seems to be the most relevant motivation: solvers that enjoy solving technical or creative challenges in a CS context have the intention to get involved in CS again in the future. Consistently with other studies on motivation in a CS context (Lakhani and Wolf, 2005; Antikainen and Väätäjä 2008 Antikainen et al. 2010; Brabham 2012, 2010, 2008), we can conclude that intrinsic motivations are important to explain both occasional and repeated participation.

Contrary to our hypotheses, extrinsic motivations were not found to significantly affect intention to continue. These variables, monetary rewards in particular, had been found to be important motivators for participating in CS initiatives (Lakhani and Wolf, 2005; Brabham, 2010; Corvello and Iazzolino, 2013). It seems that external motivating factors attract solvers but are not sufficient to generate a prolonged involvement in CS initiatives. In other words, monetary rewards and the opportunity to improve reputation are able to motivate individuals to participate in a specific challenge but are not able to get solvers interested in the CS practice itself.

This study has implication for management as well. In particular it is interesting for the managers of those firms, which intend to undertake long-term CS initiatives. These managers need to involve communities of individuals for long periods. During this time the solvers are expected to participate in several CS initiatives. Monetary rewards, which are the main motivator for participants in single challenges, are not sufficient in this case. Nor is sufficient to provide publicity to the participants, thus providing an opportunity to improve their reputation. Managers need to create trust-based relationships with the members of the CS community. Besides they need to make the challenges and the CS process interesting in itself. Since enjoyment and the opportunity to learn are the most important motivators, with regard to repeated participation, there is the need to pay attention to the design of the CS process. In these cases the management needs to give particular emphasis to the enjoyable and creative aspects of the challenge as well as to the opportunity for the solvers to measure their skills and learn from others.

This study has limitations that call for further research. The main limit is the size of the analyzed sample (64 individuals). A larger sample would be needed. Future developments will concern then first and foremost the extension of the studied sample.

The study does not consider the quality of the contribution made by the participants. To some extent, companies adopting long-term CS strategies are expected to make a selection among the participants. They will likely try to select talented solvers with the skills the company needs. Future studies should take into account the type and level of the capacities of the solvers in order to understand if different capacities are associated with different motivations.

To further evaluate the influence of the motivation variables on the intention to continue participating in CS initiatives, several moderator variables could be considered. For example the perceived technical quality of the system could reinforce the relation between motivating factors and dependent variable.

Differently from previous studies, this research did not focus on the motivations to participate in CS initiatives occasionally, but specifically considered the factors that impact on solvers' intention to continue participating. The main contribution of this study consists in having confirmed that intrinsic motivation impact on the intention to continue. Extrinsic motivations, which have been found to be significant predictors of the intention to participate in CS in previous studies, were found not significant. As a consequence different strategies are needed in companies willing to adopt long-term CS strategies in order to involve a community of solvers.

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