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## **MOTIVES FOR PARTICIPATION IN ON-LINE OPEN INNOVATION PLATFORMS**

**TUBA BAKICI**

ESADE Business School  
Information Systems  
tuba.bakici@esade.edu

**Esteve Almirall**

esteve.almirall@esade.edu

**Jonathan Wareham**

jonathan.wareham@esade.edu

### **Abstract**

The increasing need to compete on innovation, together with the prevalence of IT in our social and economic interactions has led to a globalization in the sourcing of innovation. One of the best examples of this process is the raise of on-line Open Innovation Intermediaries as both markets for innovation and a locus where innovative solutions are devised. Therefore, understanding what are the main motivations that drive the participation of people into these intermediaries is increasingly relevant. This is why this paper aims to develop an understanding on this matter with a modified version of Theory of planned behavior (TPB).

# **MOTIVES FOR PARTICIPATION IN ON-LINE OPEN INNOVATION PLATFORMS**

## **ABSTRACT**

The increasing need to compete on innovation, together with the prevalence of IT in our social and economic interactions has led to a globalization in the sourcing of innovation. One of the best examples of this process is the raise of on-line Open Innovation Intermediaries as both markets for innovation and a locus where innovative solutions are devised. Therefore, understanding what are the main motivations that drive the participation of people into these intermediaries is increasingly relevant. This is why this paper aims to develop an understanding on this matter with a modified version of Theory of planned behavior (TPB).

### **Keywords:**

Online open innovation platforms, Open innovation, Motivations, Theory of planned behavior.

# **MOTIVES FOR PARTICIPATION IN ON-LINE OPEN INNOVATION PLATFORMS**

## **INTRODUCTION**

The idea of Open innovation intermediaries has gained more and more attention recently. Especially after the application of the U.S. Government, Challenge.gov, to find innovative ideas, products and processes for the federal problems, the focus on these intermediaries has been augmented. Apart from the attention of the governments and practitioner, academia has lately focused on the open innovation intermediaries.

Intermediaries can be private organizations, individuals, experts or advisors in the form of retailers, distributors, wholesalers, platforms, media companies, agencies and financial institutions (Howells, 2006; Aoki, 2001). Among these various intermediary types, innovation intermediaries have received great attention with the rise of open innovation concept (Chesbrough, 2006; Lakhani et al. 2007). These intermediaries are used to exploit open innovation through providing an access to a loosely-knit community of innovators.

Even though research on innovation intermediaries has been developed since the 1990s, still most of the studies solely focused on the role of the intermediaries and a few studies addressed on performance (Lichtenthaler, 2005; Howells, 2006; Lichtenthaler and Ernst, 2008). There is however a gap in linking the type of participation common in on-line innovation Platforms, a mix of result oriented driven with concrete objectives together with a more open form of collaboration, with established theories. Yet still the current literature has not explored this field at an individual level or in TPB context. The objective of the present study was to cover this link by applying the explanatory power of the Theory of Planned Behavior (Fishbein and Aizen, 1975; Aizen and Fishbein, 1980) to Open Innovation Intermediaries and explore the motivation

of people who participate in these intermediaries. The data were collected through a survey that was completed by the members of Atizo community, an open innovation intermediary.

In addition to academical interests, a better understanding of motivational processes within an intermediary might help to assess the heterogeneity of the needs and decide how to react and increase user commitment. Thus the design of the intermediaries can be improved. Thus a better understanding of user motivations is crucial for its continuous success.

In the following sections, we will first present the existing literature on motivation especially focusing on intrinsic and extrinsic in relevant literatures and theories for predicting human behavior. Then, we will describe the research site and methodologies that have been for the explanation of persons' involvement in open innovation intermediaries. A web-based questionnaire was developed based on theory of planned behavior and completed by members of Atizo community. After describing this questionnaire and its results, we will discuss the implications of the results for our understanding of the motivational processes in open innovation intermediaries.

## **LITERATURE REVIEW**

One common challenge for any online community is to explore how people can be motivated to participate. This is why a vast number of studies focus on the context of people's motivations for participating in such communities. Overall the literature on human motivations, especially psychological theory, distinguished two types of motivations; intrinsic (fun, self-determination, competence, curiosity, interest, task involvement) and extrinsic (evaluation, recognition, money

or other monetary incentives) in order to explain the underlying motives of people to participate (Amabile, 1993; Ryan and Deci, 2000).

Intrinsic motivation refers to the do something for its inherent satisfactions rather than for some separable consequences. Thus individuals with intrinsic motivation cognitively desire to have a feel of competence and self-determination and affectively desire to have interest and enjoyment (Ryan and Deci, 2000; Amabile, 1993; Deci and Ryan, 1985; Reeve et al., 1986). Altruism and community identification are also two modes of intrinsic motivation where altruism is when someone seeks to increase the welfare of others and community identification refers to the need for belonging (Zeityln, 2003; Kollock, 1999).

Intrinsic motives such as fun (von Hippel and von Krogh, 2003; Torvalds and Diamond, 2001) recognition (Jeppesen and Frederiksen, 2006; Lerner and Tirole, 2002) and reputation (Bagozzi and Dholakia, 2002; Hargadon and Bechky, 2006; Lakhani and Wolf, 2005) were found to be the main motives for participators rather than monetary rewards.

Extrinsic motivations have been analyzed mainly by economists in order to define the economic model of human behavior (Frey, 1997). Individuals with extrinsic motivation engage with an activity in order to achieve extrinsic rewards. These extrinsic rewards include direct or indirect monetary compensation such as evaluation, money and recognition (Ryan & Deci, 2000; Amabile, 1993). Both Antikainen and Väättäjä (2008) and Wasko and Faraj (2000) emphasized on the monetary rewards as the main motivation factor. Similarly online community research field also observed that users are motivated by monetary rewards and/or nonmonetary rewards.

With the expansion of online communities; people's motivations gained the interest of other literatures. Applied to the open-source context, developers' motivations to participate have been analyzed within a number of studies. Since open source software projects do not pay for participants' services, contributors' motivations do vary. A large number of studies in open source literature distinctively used two motives, intrinsic and extrinsic, for grouping the contributors' motivations (Hars and Ou, 2002; Bitzer et al. 2007; Lakhani and Wolf, 2005).

Following up this conjecture with empirical research Lakhani and Wolf (2005), Hars and Ou (2002) and Hertel et al., (2003) analyzed the characteristics of the OSS contributors and their motivations. Both Hertel et al. (2003) and Lakhani and Wolf (2005) find intrinsic motives as the most fundamental reasons for programmers to participate into OSS projects. For instance enjoyment-based intrinsic motivation is the strongest and most pervasive drivers than others (Lakhani and Wolf, 2001; Lakhani and Wolf, 2005)

The studies on contributors' motivations of open source software mainly focused on individual motives, impact of firms' and community participation on individual, relationship between motives and technical design (Von Krogh and Von Hippel, 2006).

Open-source programmers mainly participate for a personal need for a certain kind of software, for their own self-interest (Hars and Ou, 2002). There are future indirect rewards such as peer recognition, self-marketability, and the potential for selling its related services or products and to improve their personal skills, capabilities, and knowledge base or by selling related products and services and career advancement (Holmström, 1999; Hars and Ou, 2002).

Open-source programmers may also be motivated by external factors. Social motives and norms found to be relate to individual levels of contribution in open source software projects (Bergquist

and Ljungberg, 2001; Osterloh et al., 2004). Therefore, a vast number of studies focus on motivations in open source projects.

Applied to the open innovation intermediaries' context, there are only a few studies. Antikainen, Mäkipää and Ahonen (2010) resulted that intrinsic rewards are as decisive as monetary rewards. Similarly Antikainen and Väättäjä (2010) resulted that open innovation intermediaries both use monetary and non-monetary rewards. Similar to the Open source, in the case of open innovation intermediaries it is also reasonable to assume that users can have various types of motivations. However this is why a social psychological model is required to explore these motivations and their relations on the intention to participate. Thus with this research we aim to contribute to both open innovation and TPB literatures.

## **THEORY OF PLANNED BEHAVIOR**

Psychology has various theories for predicting human behavior but among those the theory of reasoned action (Ajzen and Fishbein, 1980) and its extension, theory of planned behavior models (Ajzen, 1991) are one of the most commonly used in several research fields (Chang, 1998; Sheppard et al., 1984; Madden et al., 1992).

Both theories assume that people are systematically use information and act rationally. The main proposition is that an individual's behavior is determined by the individual's *behavioral intention* (BI) provides the most accurate prediction of behavior (Fishbein and Ajzen, 1975). In TPB behavioral intention is a function of three factors: *Attitude (A)*, *Subjective Norm* (SN) and *Perceived behavioral control* (PBC). The difference between these two theories is that the theory

of planned behavior has perceived behavioral control as another factor of behavioral intention (Ajzen, 1991).

Attitude towards the behavior refers to the degree to which a person is favorable or unfavorable for that behavior. Subjective Norm is defined as the degree to which an individual perceives a behavior as a norm among the people who are important to him or her (Ajzen and Fishbein, 1980). Finally perceived behavioral control refers as the degree of difficulty or ease of performing a behavior (Ajzen, 1991). Thus the theory of planned behavior attempts to establish the relationships between attitudes, subjective norm, perceived behavioral control, and behavioral intention using confirmatory modeling techniques.

TRA model has two problems as Sheppard et al. (1988) pointed out; one is that the prediction of behavior from intention is problematic and second there is no conditions in the model for considering either the probability of failing to perform one's behavior or the outcomes of such failure in deciding one's intentions. Due to these problems, Ajzen (1985) extended the model into TPB which resolves these issues.

Although theory of planned behavior is an extension of theory of reasoned action, it fit better for the online open innovation intermediary context. This is due to perceived behavioral control's explanation power in predicting behavioral intention. Therefore, it is reasonable to believe that theory of planned behavior will provide a very good foundation for us to investigate the motivations of participators to open innovation intermediaries.



Figure 1 depicts our research model. Note that the model deviates in two major ways from standard TPB formulation in recognizing that attitude inherently involves intrinsic and extrinsic rewards and perceived behavioral control is posited to directly influence intention to participate.

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Insert Figure 1 about here  
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Even though quite a few studies focused on users' motivations in various literatures, still research on motivations in online open innovation intermediaries is lacking. Therefore, our study focusing on the motivations for users to participate in online open innovation platforms context is a novel and essential opening towards holistic understanding and dissemination of open innovation.

In this following section we come up with certain hypotheses based the TPB model.

*Hypothesis 1. The greater the anticipated networking, the more favorable the attitude towards participating in Crowdsourcing/Open Innovation contests.*

Crowdsourcing and Open Innovation contests focus on the prize as the main motivator. However, the value of networking in an open dynamic market such as the one of innovation has been largely stressed while social networks with the aim of increasing the connections between professionals have largely increased.

*Hypothesis 2. Intrinsic motivations dominate over extrinsic motivations in conforming individual attitude towards Crowdsourcing/Open Innovation contests.*

There is a large gap in this territory between what we know and what is commonly applied. While results derived from experimentation reveal that if tasks are complex requiring more than a mechanical performance, then intrinsic motivators perform better than extrinsic ones (Amabile, 1993). There is little doubt that the creation of new ideas, product or services qualifies as a creative non-mechanical task, however Open Innovation intermediaries and Crowdsourcing platforms insist in the use of extrinsic motivators.

*Hypothesis 3. The more favorable the social and network valuation towards participating in Crowdsourcing / Open Innovation contests is, the greater the participation in these exercises will be.*

Cultural factors both social and organizational have largely been described as critical drivers for knowledge sharing (Constant et al., 1996; Huber, 2001; Olikowski, 1993; Buckman, 1998). Therefore we could consider that they also have a positive influence in conforming the subjective norm that moderates the intention to participate in Crowdsourcing / Open Innovation contests.

*Hypothesis 4. The greater the subjective norm to participate in Crowdsourcing / Open Innovation contests, the more favorable the attitude towards participation will be.*

The subjective norm construct, defined as the perceived social pressure to perform or not perform a behavior (Ajzen, 1991) has received considerable support as an antecedent to the construct Intention to Participate (Matheison 1991; Taylor and Todd 1995; Thompson et al., 1991) therefore the formulation of this hypothesis looks well aligned to existing literature.

*Hypothesis 5. Attitude dominates over Subjective norm in conforming intention to participate in Crowdsourcing/Open Innovation contests.*

## **RESEARCH SITE AND METHODOLOGY**

The aim of this research here is to explore the main motivations of users to participate in platforms of open innovation intermediaries. Given the novelty of the research problem, an explanatory study has been chosen as the research method. Following a study on Atizo, we have chosen a quantitative study to achieve an in-depth understanding of the underlying motives of users to participate in open innovation intermediaries.

### **Research Site**

Like the other online open innovation intermediaries, Atizo has a web-based platform where it intermediates companies' challenges with ideas & solutions of creative people. Christian Hirsig, the CEO of Atizo, delineates their business model as a media company so their customer companies are paying for publication of their need as a challenge on the platform. The members of the community then submit their ideas online in where other users can also see and make comments so that the initial idea eventually develops collaboratively. After this online brainstorming phase users filter the ideas by voting and finally companies pick the best ideas among them and divide the award. This mechanism what makes Atizo distinctive from the most of the innovation platforms that have a system more like an idea box where users individually drop their ideas without any collaboration.

### **Data Collection**

Here the intention by conducting this research is to identify the main motives of users to participate in online innovation intermediaries. To achieve these, a variety of data was collected

through structured in-depth interview with Christian Hirsig, CEO of Atizo, non-participant observations in their internet platform and log files.

To test the Theory of Planned Behavior (TPB) model in open innovation intermediary context, we conducted a Web-based survey on Atizo community. The initial version of the survey instruments was refined through a pre-test with MBA students of ESADE Business School, 2009-2010. Then we sent personalized e-mails to member of Atizo, inviting him or her to participate in the survey. The survey generated 113 responses (15 females, 98 males; mean age = 41 years) for a response rate of 18.3% and mainly from Germany, Austria and Switzerland. Most of the participants were full-time employees or freelancers and the rest were students. Users received 6.5 rewards on average for their submitted ideas. Then we examined our hypotheses by applying the partial least squares (PLS) method to the collected data.

We developed the items in the questionnaire by adapting the measures that had been validated by prior researches. TPB measures include items that assess attitude, subjective norm, and perceived behavioral control of intention to participate in open innovation intermediaries. Items that measure perceived pressures were added in the TPB measure section. Measures for intention, attitude, subjective norm, and perceived behavioral control were adopted and modified from Ajzen (1991) and Bock et al. (2001).

In this study, intention is referred as an individual's willingness to participate in an open innovation intermediaries. Thus stronger the intention is the more likely it will be to participate.

Attitude as an antecedent of intention is defined as the degree of an individual's favorableness of participating in an open innovation intermediary (Ajzen & Fishbein, 1980). As a significant predictor of intentions, subjective norm indicates the degree to which an individual perceives

participating in an open innovation intermediary. It is also a function of a person's motivation to comply the behavior and normative belief to perform the behavior (Ajzen and Fishbein, 1980).

As another antecedent of intention, perceived behavioral control is an individual's control over his/her participation in an intermediary (Ajzen, 1991; 1985). We created two items; external influence and interpersonal influence to measure subjective norm. Specifically extrinsic rewards and intrinsic rewards items were developed based on the study of Amabile (1994) on intrinsic and extrinsic motivations. Items of TPB measures were measured by using 5 and 11-point Likert scales.

## **Research Method**

The method of data analysis used in this study was structural equation modeling (SEM) with latent variables. The statistical program SmartPLS (Chin 1998; Ringle et al. 2010) was used to perform the structural modeling analysis. A large number of studies on the theory of Planned behavior validated the use of SEM. Compared to alternative SEM techniques SmartPLS program has minimal demands in terms of sample size to validate a model. Thus we found highly appropriate to use SEM with SmartPLS Version 2.0.M3 program in our analysis (Ringle et al. 2010).

To assess the validity of our measurement model, we checked for content validity and internal consistency. Content validity between the items and the existing literature was determined by the interview with CEO of Atizo and with a pre-test of the model. Additionally, backward translation was used to ensure consistency between the original English version of the instrument and the German version. We checked the internal consistency of the instruments with Cronbach's alpha

values. Cronbach's alpha values ranged from 0.41 to 0.80. For the discriminant validity, correlation of constructs was checked to show that each construct shares larger variance with its own measures than with other measures as in Table 1 and 2.

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Insert Table 1&2 about here  
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### **CFA results**

To assess the adequacy of the measurement models, we further performed a confirmatory factor analysis. It was observed that Small Participation model fits the data well with high loading and low standard errors. The  $\chi^2$  measure of model fit is 71.87 (df=32), which is too small to reject the null of a good fit (p=0.00). Additionally the Comparative Fit Index (CFI= 0.89) and Incremental Fit Index (IFI=0.89) are low which is due to the sample size but still they can be marginally acceptable. Using a cut-off rule of .05, the RMSEA is acceptable to indicate a good fit.

TPB model fits the data well with the  $\chi^2$  measure of model fit is 364.40 (df=155), which is too small to reject the null of a good fit (p=0.00). Even though CFI (0.90) and RMSEA (0.09) are slightly low still they can be marginally acceptable. In this model, Incremental Fit Index (IFI=0.90) which is based on the comparison of the fit of a substantive model to that of a null model is at acceptable parameters. Accordingly each model provides a good fit and slightly low but acceptable IFI and CFI are due to the sample size.

## RESULTS

Initially we started with a simple model that solely focused on the affects of intrinsic and extrinsic motivations on participation. The results based on the structural equation modeling for the first model were depicted in Figure 2. Here this figure displays the factor loadings and R-Squares as a PLS result directly in the path model. Appendix A also shows the loadings, quality criteria (AVE, Composite reliability, R-Square, Cronbachs Alpha, Communality and Redundancy), path coefficients and bootstrapping results (t-statistics).

Quality indicators for this structural equation model represent a well explained model with an R2 of 0.420 and the path is highly significant with t-values 3.059 and 6.049.

Generally it is expected that the extent of effect of extrinsic motivations on participation is to dominate over intrinsic motivations. However in this model we observed that in terms of participation that this belief does not hold as much as it is expected to be.

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Insert Figure 2 about here  
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Afterwards TPB model was implemented as in Figure 3. However the model modified in two ways from standard TPB formulation, one is the inclusion of intrinsic and extrinsic motivations and the other one, networking as a component of Subjective norm to evaluate their impact on participation.

The figure 3 illustrates the results of the modified TPB model, factor loadings and R-Squares based on the structural equation modeling. The outer loadings, quality criteria (AVE, Composite reliability, R-Square, Cronbachs Alpha, Communality and Redundancy), path coefficients and bootstrapping results (t-statistics) were presented in Appendix B.

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Insert Figure 3 about here  
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The preceding piece has presented an analysis of the factors affecting the intention to participate in open innovation intermediaries. Through this Atizo case, the main motives for participation in online open innovation intermediaries were revealed and could be further used to improve the participation rate. Thus this study provides an evolutionary perspective on users' participation into online open innovation intermediaries. Table 3 summarizes the results of hypotheses testing.

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Insert Table 3 about here  
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For the H1, in the model we can observe that the anticipated returns in terms of networking (loading factors 0,495) is one of the main extrinsic motives, likewise monetary rewards (loading factors 0,88), showing that in conforming attitude both have a similar level of importance. This supports that the value of networking in open innovation intermediaries is a crucial factor for attitude to participate.



Results for H2 shows that intrinsic motivator with loading factors of 0.792 is one of the main component on attitude. However the extrinsic motivator is found insignificant with loading factors 0.072.

As the H3 suggests, both social and organizational factors have a positive influence in conforming the subjective norm. This is indeed the case, with an average loading factor of 0.578 and 0.696; they positively contribute to the formation of the subjective norm. Thus both factors are critical drivers for knowledge sharing and so participating.

With a loading factor of 0.229, it pales compared to attitude (0.608), probably reflecting the more individualistic choice that the participation in this type of contest is, without having been established a clear social norm to this respect as this also supports H4 and H5. Thus even though subjective norms are less crucial in conforming intention to participate in Open Innovation contests, still they favor the attitude.

## **DISCUSSION**

Based on the preliminary model we explored that intrinsic motives especially personal development and fun are as crucial as extrinsic ones. Among intrinsic motivations, fun (with a loading 0.915) and enjoyment (with a loading 0.663) is one of the main motives for people to participate. Whereas belonging to a community (with a loading 0.393) is not a major intrinsic motivator for participating. It is also found that money (0.880) is the strongest extrinsic motivator but reputation (0.399) does not work as an extrinsic motivator.

Here we also modified the TPB model and used real participation data instead of the survey results for intention to participate, in other words assessed participation. As figure 3 and 4 shows, a significant decrease from 0.4 to 0.1 in the R-square of intention to participate is observed. Compared to the assessed participation model with real participation, social factors gain more importance compared to organizational factors. The loadings, quality criteria and t-statistics were presented in Appendix C.

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Insert Figure 4 about here  
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Based on our conclusions, we propose the following propositions to those who lead knowledge-management within online intermediary platforms. First, acknowledge that extrinsic rewards are not necessarily the primary motive for participation. Second, emphasize the fun and enjoyment that people will receive through participating in open innovation contests. For instance, they can provide interesting and enjoyable contests/challenges. Finally, actively support the collaboration and networking among members during contests in online platforms. In particular, allow them to be able to provide feedback each others' ideas.

## **CONCLUSIONS**

Neoclassical economics portrays individuals as utility maximizers in a given set of preferences (Smelser and Swedberg 1994). However, the importance of the behavioral aspects and social network effects has been largely stressed recently. In this research we aim to precisely look at this

behavioral aspect when elucidating the motives and intentions for participating in Crowdsourcing/Open Innovation contests.

Two main constructs in our model aim to capture these aspects, the attitude and the subjective norm. There, extrinsic rewards are a mere component in the model and not precisely the most important one. We can observe how intrinsic rewards and networking affect the construct Intention to participate in a more pronounced way than monetary rewards. This contrasts sharply with the established motivations in the actual platforms and the lack of elements allowing the expression and development of what, according to the model, constitute the main motivators.

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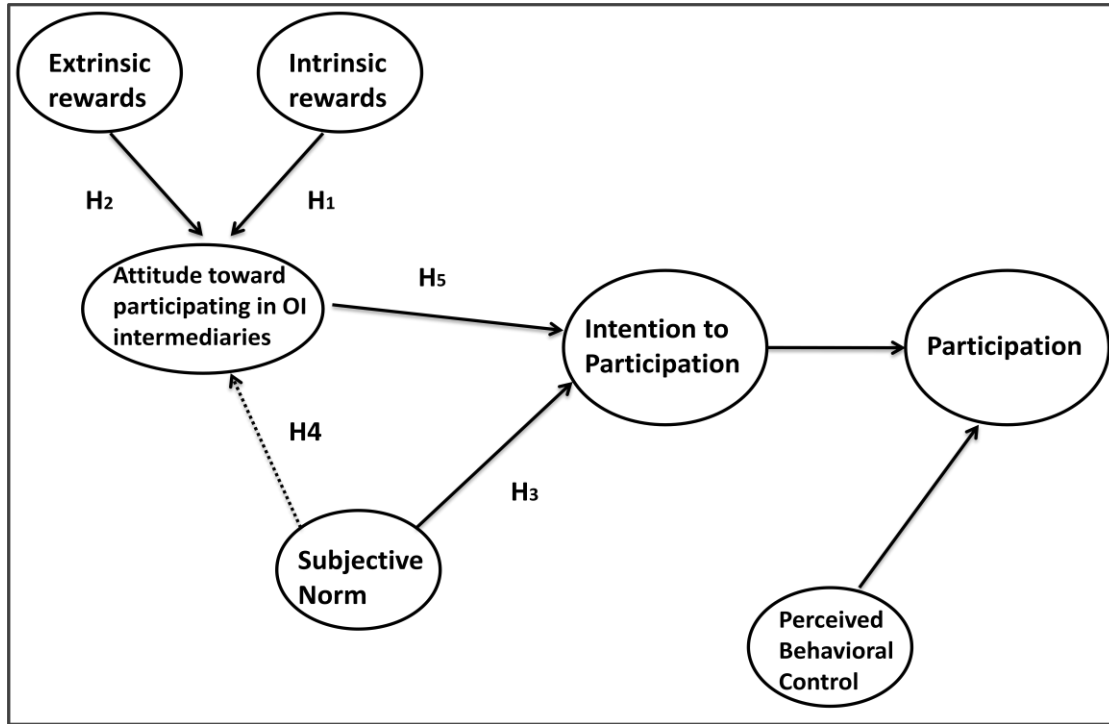
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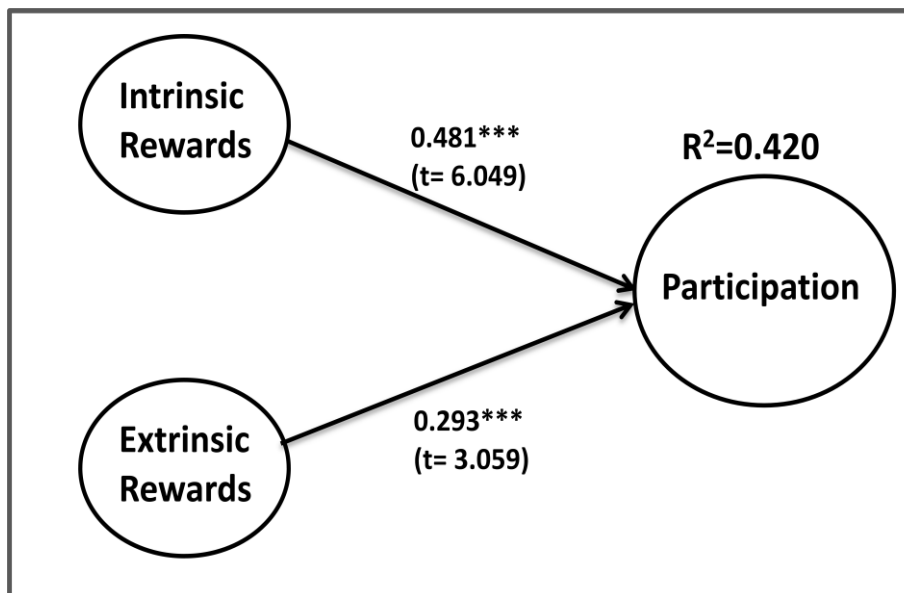
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**FIGURE 1**  
**Research Model**

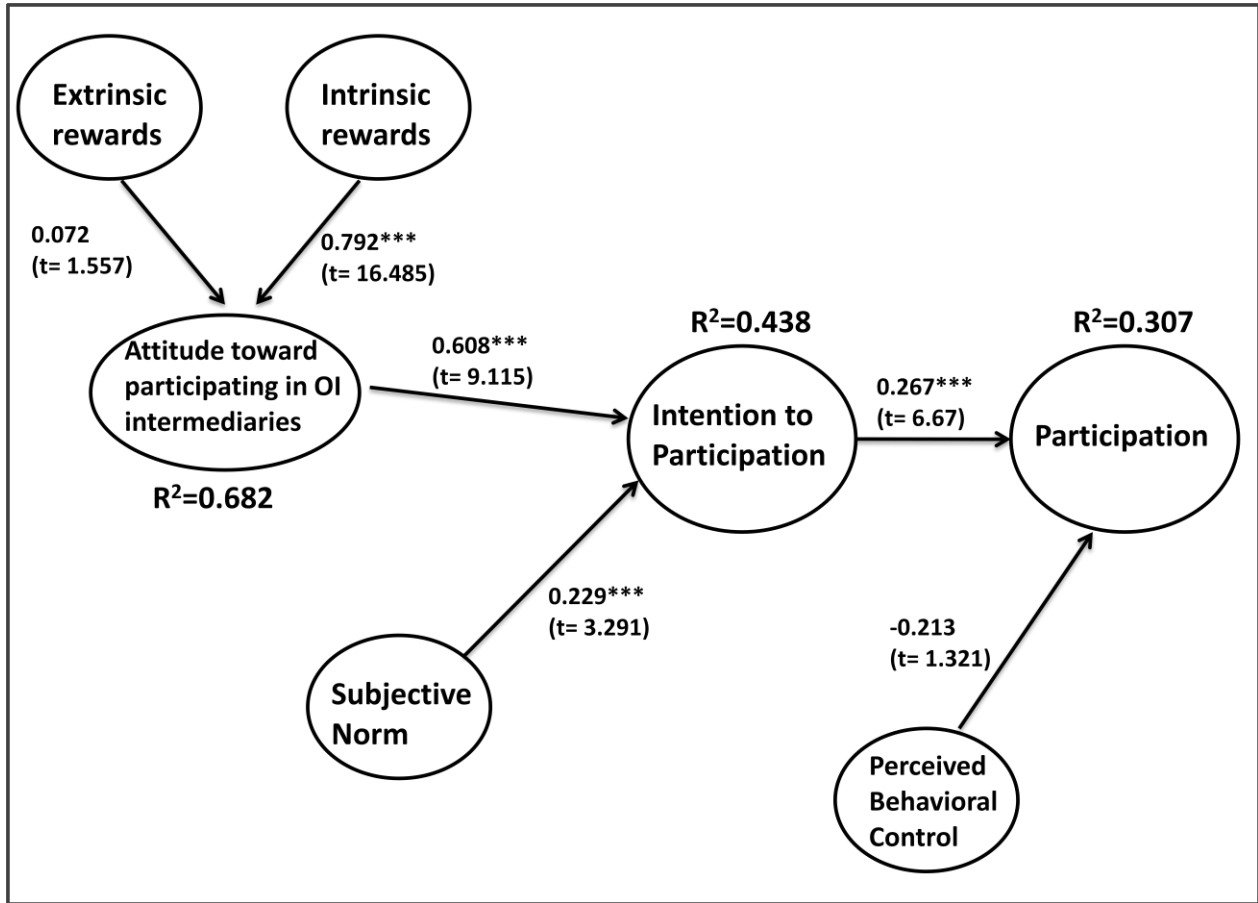


**FIGURE 2**  
**Results of initial PLS analysis**



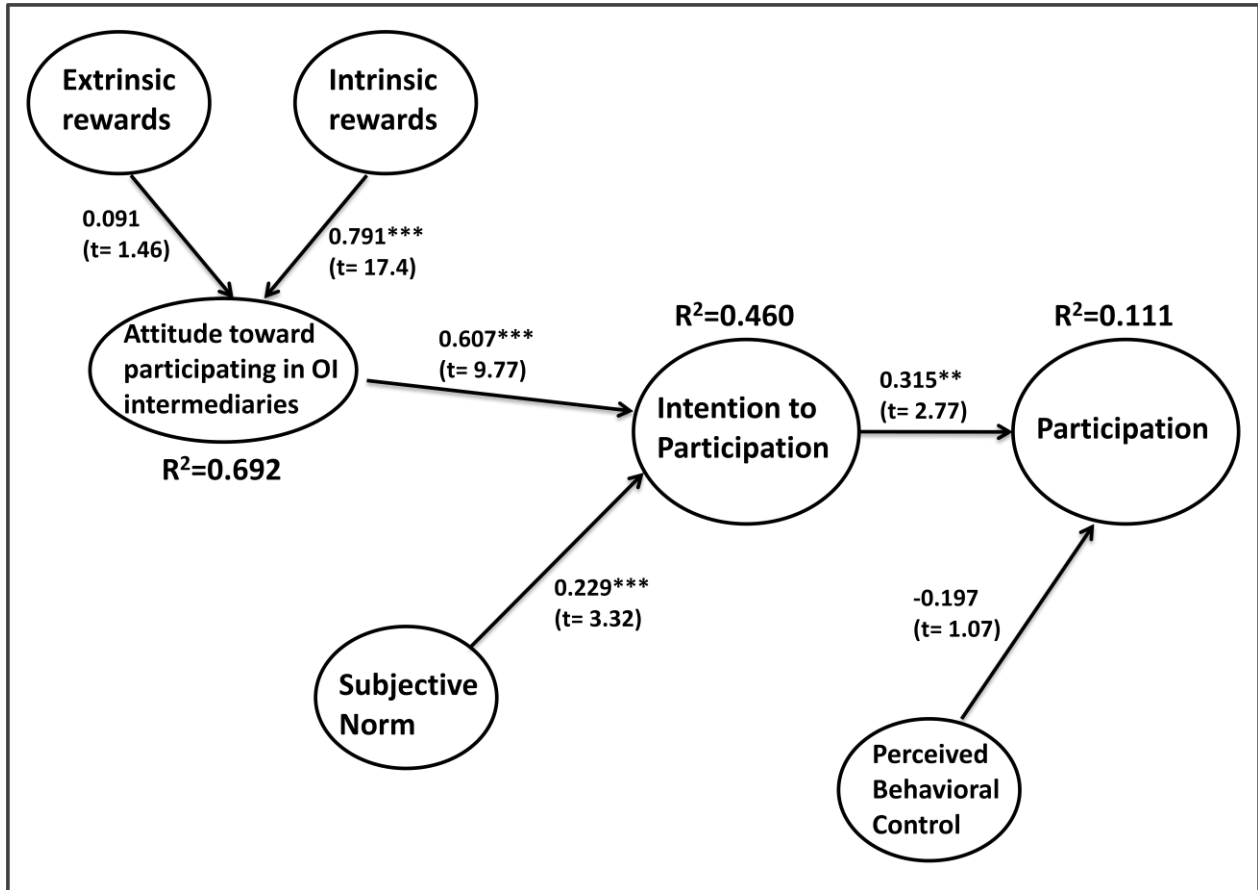
\* $p < 0.1$  \*\* $p < 0.05$  \*\*\* $p < 0.01$

**FIGURE 3**  
**Results of PLS analysis - Based on assessed participation**



\* $p < 0.1$  \*\* $p < 0.05$  \*\*\* $p < 0.01$

**FIGURE 4**  
**Results of PLS analysis – Based on real participation**



\* $p < 0.1$  \*\* $p < 0.05$  \*\*\* $p < 0.01$

**TABLE 1**  
**Correlations among the latent variables for Small Participation model**

	Extrinsic	Intrinsic	Participation
Extrinsic	1		
Intrinsic	0,3206	1	
Participation	0,477	0,6034	1

All correlations are significant at  $p = 0.05$ .

**TABLE 2**  
**Correlations among the latent variables for TPB assessed participation model**

	Attitude	Extrinsic	Intention to Participate	Intrinsic	PB Control	Participation	Subjective Norm
Attitude	1						
Extrinsic	0,3429	1					
Intention to Participate	0,6357	0,3807	1				
Intrinsic	0,8354	0,3363	0,7003	1			
PB Control	0,1095	0,2175	0,2025	0,1475	1		
Participation	0,4903	0,4595	0,5894	0,5383	0,222	1	
Subjective Norm	0,1042	0,1186	0,3177	0,1676	0,5131	0,1554	1

All correlations are significant at  $p = 0.05$ .

**TABLE 3**  
**Results of Hypotheses testing**

<b>Hypotheses</b>	<b>Results</b>
<b>H1.</b> The greater the anticipated networking, the more favorable the attitude towards participating in Crowdsourcing/Open Innovation contests.	Supported
<b>H2.</b> Intrinsic motivations dominate over extrinsic motivations in conforming individual attitude towards Crowdsourcing/Open Innovation contests.	Not Supported
<b>H3.</b> The more favorable the social and network valuation towards participating in Crowdsourcing / Open Innovation contests is, the greater the participation in these exercises will be.	Supported
<b>H4.</b> The greater the subjective norm to participate in Crowdsourcing / Open Innovation contests, the more favorable the attitude towards participation will be.	Supported
<b>H5.</b> Attitude dominates over Subjective norm in conforming intention to participate in Crowdsourcing/Open Innovation contests.	Supported

## APPENDIX A

**TABLE A1. Weights and Loadings of the Measures**

Construct	Item	Weight	Loading	Standard Error	t-value
Intrinsic Rewards	IN1-2	0,4472	0,7401	0,1081	6,8473
	IN2-11	0,4654	0,7541	0,1028	7,3336
	IN3-23	0,1681	0,4855	0,1375	3,5301
	IN4-38	0,3441	0,6872	0,1231	5,5832
Extrinsic Rewards	EX1-13	-0,1629	0,27	0,1805	1,4954
	EX2-17	0,4883	0,5678	0,1968	2,8846
	EX3-19	0,0078	0,2872	0,202	1,4219
	EX4-22	0,8482	0,9013	0,1178	7,6505
Participation	PAR1-1	0,2504	0,8278	0,0885	9,3577
	PAR2-39	0,2168	0,8663	0,0604	14,3315
	PAR3-41	0,6296	0,9608	0,0508	18,9259

\*Both standard errors and t-values are for loadings, not weights.

**TABLE A2. Quality Criteria:**

	AVE	Composite Reliability	R Square	Cronbachs Alpha	Communality	Redundancy
Extrinsic	0	0	0	0	0,3225	0
Intrinsic	0	0	0	0	0,4561	0
Participation	0	0	0,4202	0	0,7863	0,1484

**TABLE A4. Path Coefficients:**

	Extrinsic	Intrinsic	Participation
Extrinsic	0	0	0,2932
Intrinsic	0	0	0,4810
Participation	0	0	0

**TABLE A5. Bootstrapping results: (T - statistics)**

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics ( O/STERR )

Extrinsic -> Participation	0,2932	0,2927	0,0958	0,0958	3,0591
Intrinsic -> Participation	0,481	0,5047	0,0795	0,0795	6,0495

## APPENDIX B

**TABLE B1. Weights and Loadings of the Measures**

Constructs	Item	Weight	Loading	Standard Error	t-value
<b>Intrinsic Rewards</b>	IN1	0,742	0,9149	0,0366	25,0142
	IN2	0,0972	0,4576	0,0916	4,9949
	IN3	0,0942	0,3932	0,0872	4,5109
	IN4	0,3613	0,6633	0,0597	11,1081
<b>Extrinsic Rewards</b>	EX1	0,0926	0,3998	0,2021	1,9784
	EX2	-0,2856	0,2291	0,2044	1,1206
	EX3	0,5408	0,4945	0,1888	2,6184
	EX4	0,8645	0,8803	0,1308	6,7312
<b>Participation</b>	PAR1	0,2658	0,8446	0,0722	11,704
	PAR2	0,352	0,9072	0,072	12,601
	PAR3	0,4893	0,9323	0,0592	15,7382
<b>Attitude</b>	AT1	0,6533	0,8861	0,0191	46,4611
	AT2	0,5186	0,8119	0,0664	12,2183
<b>Perceived Behavioral Control</b>	PBC1	1	1	0	
<b>Subjective Norm</b>	SN1	0,4741	0,6155	0,2163	2,8453
	SN2	0,2819	0,5414	0,1966	2,7538
	SN3	0,3328	0,6613	0,2483	2,6638
	SN4	0,4586	0,7316	0,2355	3,1062
<b>Intention to Participate</b>	INTEN1	0,4092	0,6649	0,0525	12,6714
	INTEN2	0,4148	0,8733	0,0383	22,8259
	INTEN3	0,4104	0,8911	0,0291	30,6076

**TABLE B2. Quality Criteria Overview:**

	<b>AVE</b>	<b>Composite Reliability</b>	<b>R Square</b>	<b>Cronbachs Alpha</b>	<b>Communality</b>	<b>Redundancy</b>
<b>Attitude</b>	0,7222	0,8384	0,6818	0,6196	0,7222	0,0509
<b>Extrinsic</b>	0	0	0	0	0,3079	0
<b>Intention to Participate</b>	0,6663	0,855	0,4376	0,7375	0,6663	0,239
<b>Intrinsic</b>	0	0	0	0	0,4103	0
<b>PB Control</b>	1	1	0	1	1	0
<b>Participation</b>	0	0	0,3071	0	0,8018	0,234
<b>Subjective Norm</b>	0,4111	0,734	0	0,5243	0,4111	0

**TABLE B3. Path Coefficients:**

	<b>Attitude</b>	<b>Extrinsic</b>	<b>Intention to Participate</b>	<b>Intrinsic</b>	<b>PB Control</b>	<b>Participation</b>	<b>Subjective Norm</b>
<b>Attitude</b>	0	0	0,4997	0	0	0	0
<b>Extrinsic</b>	0,0533	0	0	0	0	0	0
<b>Intention to Participate</b>	0	0	0	0	0	1,6905	0
<b>Intrinsic</b>	0,5148	0	0	0	0	0	0
<b>PB Control</b>	0	0	0	0	0	0,1368	0
<b>Participation</b>	0	0	0	0	0	0	0
<b>Subjective Norm</b>	0	0	0,2176	0	0	0	0

**TABLE B4. Bootstrapping results**

	<b>Original Sample (O)</b>	<b>Sample Mean (M)</b>	<b>Standard Deviation (STDEV)</b>	<b>Standard Error (STERR)</b>	<b>T Statistics ( O/STERR )</b>
<b>Attitude -&gt; Intention to Participate</b>	0,5922	0,5873	0,065	0,065	9,1156
<b>Attitude -&gt; Participation</b>	0,3052	0,3101	0,0605	0,0605	5,0415

Extrinsic -> Attitude	0,0997	0,1186	0,064	0,064	1,5572
Extrinsic -> Intention to Participate	0,059	0,0692	0,037	0,037	1,5957
Extrinsic -> Participation	0,0304	0,0362	0,0196	0,0196	1,5497
Intention to Participate -> Participation	0,5154	0,5268	0,0773	0,0773	6,6702
Intrinsic -> Attitude	0,7818	0,7791	0,0474	0,0474	16,4846
Intrinsic -> Intention to Participate	0,463	0,4587	0,0659	0,0659	7,0249
Intrinsic -> Participation	0,2386	0,2424	0,0533	0,0533	4,48
PB Control -> Participation	0,1247	0,1336	0,0944	0,0944	1,3206
Subjective Norm -> Intention to Participate	0,2332	0,2595	0,0709	0,0709	3,2912
Subjective Norm -> Participation	0,1202	0,1363	0,0419	0,0419	2,8716

## APPENDIX C

**TABLE C1. Weights and Loadings of the Measures**

Construct	Item	Weight	Loading	Standard Error	t-value
Intrinsic Rewards	IN1	0,7435	0,915	0,0364	25,1592
	IN2	0,1011	0,462	0,0937	4,9323
	IN3	0,0809	0,3938	0,0831	4,7365
	IN4	0,3632	0,6642	0,0604	10,9967
Extrinsic Rewards	EX1	0,103	0,4076	0,1935	2,1064
	EX2	-0,2603	0,2416	0,2016	1,1987



	EX3	0,4997	0,4749	0,1914	2,4811
	EX4	0,8757	0,8949	0,14	6,3909
<b>Participation</b>	Ideas	-1,0009	0,7496	0,1869	4,0113
	Projects	0,6172	0,7992	0,2085	3,8338
	Rewards	0,075	0,7074	0,2059	3,4357
	Comments	1,2658	0,8153	0,1547	5,2707
	Contribute	-0,0222	0,5214	0,2863	1,8213
	Ratings	0,2223	0,826	0,2371	3,4834
<b>Attitude</b>	AT1	0,6578	0,8838	0,0201	43,9467
	AT2	0,5196	0,8057	0,0686	11,744
<b>Perceived Behavioral Control</b>	PBC1	1	1	0	0
<b>Subjective Norm</b>	SN1	0,4773	0,6001	0,2116	2,8358
	SN2	0,2417	0,5238	0,2071	2,5291
	SN3	0,3513	0,681	0,2281	2,9861
	SN4	0,4629	0,7512	0,2155	3,485
<b>Intention to Participate</b>	INTEN1	0,4688	0,7147	0,0577	12,3829
	INTEN2	0,384	0,8461	0,0441	19,1942
	INTEN3	0,3912	0,8691	0,0325	26,7748

**TABLE C2. Quality Criteria Overview:**

	<b>AVE</b>	<b>Composite Reliability</b>	<b>R Square</b>	<b>Cronbachs Alpha</b>	<b>Communality</b>	<b>Redundancy</b>
<b>Attitude</b>	0,7151	0,8336	0,692	0,6061	0,7151	0,0473
<b>Extrinsic</b>	0	0	0	0	0,3127	0
<b>Intention to Participate</b>	0,6607	0,853	0,4597	0,7407	0,6607	0,2496
<b>Intrinsic</b>	0	0	0	0	0,4117	0
<b>PB Control</b>	1	1	0	1	1	0

<b>Participation</b>	0	0	0,1106	0	0,5533	0,0451
<b>Subjective Norm</b>	0,4156	0,7365	0	0,5335	0,4156	0

**TABLE C3. Path Coefficients:**

	<b>Attitude</b>	<b>Extrinsic</b>	<b>Intention to Participate</b>	<b>Intrinsic</b>	<b>PB Control</b>	<b>Participation</b>	<b>Subjective Norm</b>
<b>Attitude</b>	0	0	0,513	0	0	0	0
<b>Extrinsic</b>	0,0491	0	0	0	0	0	0
<b>Intention to Participate</b>	0	0	0	0	0	44,0154	0
<b>Intrinsic</b>	0,5184	0	0	0	0	0	0
<b>PB Control</b>	0	0	0	0	0	-18,6788	0
<b>Participation</b>	0	0	0	0	0	0	0
<b>Subjective Norm</b>	0	0	0,2141	0	0	0	0

**TABLE C4. Bootstrapping results**

	<b>Original Sample (O)</b>	<b>Sample Mean (M)</b>	<b>Standard Deviation (STDEV)</b>	<b>Standard Error (STERR)</b>	<b>T Statistics ( O/STERR )</b>
Attitude -> Intention to Participate	0,607	0,6019	0,0621	0,0621	9,7788
Attitude -> Participation	0,1915	0,1964	0,0719	0,0719	2,6646
Extrinsic -> Attitude	0,0913	0,1025	0,06	0,06	1,5219
Extrinsic -> Intention to Participate	0,0554	0,0612	0,0357	0,0357	1,5513
Extrinsic -> Participation	0,0175	0,0202	0,0145	0,0145	1,2044
Intention to Participate -> Participation	0,3155	0,3262	0,1139	0,1139	2,7708
Intrinsic -> Attitude	0,7911	0,7918	0,0454	0,0454	17,4085

Intrinsic -> Intention to Participate	0,4801	0,4774	0,0629	0,0629	7,6375
Intrinsic -> Participation	0,1515	0,1555	0,0579	0,0579	2,6147
PB Control -> Participation	-0,1968	-0,2228	0,1834	0,1834	1,0732
Subjective Norm -> Intention to Participate	0,2292	0,2421	0,0689	0,0689	3,3279
Subjective Norm -> Participation	0,0723	0,0783	0,0355	0,0355	2,0372