

A Motivational Model for Continuous Participation in Crowdsourcing among Low Income Group

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Abstract

In ensuring the success of crowdsourcing implementation, a deeper understanding of motivational factors that drive people to participate in this crowdsourcing application is crucial. Although several studies have previously described motivational factors in crowdsourcing, very limited studies have examined intrinsic and extrinsic factors simultaneously in a single model. Identifying the motivational factors is crucial to improve the task design in crowdsourcing and the rewarding process in crowdsourcing platform. The objective of this paper is to provide an empirical motivational model for continuous intention to participate in crowdsourcing. The model is evaluated using 134 respondents using structural equation modeling method. Our findings indicate interesting intrinsic and extrinsic motivational factors influencing intention to participate in crowdsourcing. The implications of this study for system developers are carefully designed and accommodate tasks that are interesting and challenging at the same time. In terms of theory, a more dynamic motivational model that considers temporal aspect should be explored.

Keywords – *intrinsic, extrinsic, self-determination theory, job characteristic theory*

1. INTRODUCTION

One of Malaysia's national result key areas (NKRA) includes the enhancement of quality of life for people with low household income. In addressing this issue, Malaysian Digital Economy Corporation (MDEC) has launched a crowdsourcing platform. This platform provides opportunity for people to gain additional income by performing micro-tasks online. This crowdsourcing platform specially targeted the B40 group in which the household income is below than RM 4000 per month. In supporting the government's crowdsourcing initiative and

ensuring the success of its implementation, a deeper understanding on motivational factors that motivate people to participate in this crowdsourcing application is needed. Since active participation of crowd is the heart of crowdsourcing success, sustainable deployment of crowdsourcing depends on the critical mass that is willing to use the system (Surowiecki 2004; Leimester 2010). Additionally, since Malaysia is just starting to roll out this crowdsourcing initiative, examining the intricate relationships of motivational factors are important beginning steps towards sustaining the usage of this crowdsourcing platform. Although there have

been extensive works in literature on mass participation in open source, these findings cannot be directly adopted since the motive of participation in outsourcing versus crowdsourcing is not similar. Thus, it is of great importance to explore what motivates the crowd to participate in crowdsourcing (Zhao & Zhu, 2014). Addressing this research gap is highly important for Malaysia since crowdsourcing initiative under the Digital Malaysia has just started, but facing challenges.

In the current literature, the role motivational factors like extrinsic reward factor is still debatable since the findings of initial studies on the role of monetary rewards are conflicting (Lakhani et al. 2007; Brabham 2008). Moreover, these studies are largely descriptive studies based on structured surveys or experiments using college students (e.g., Moussawi & Koufaris, 2013; Rogstadius et al., 2011). Therefore, they do not sufficiently capture the work context from crowdworkers' perspective to provide a holistic understanding of this complex phenomenon. Additionally, B40 group may perceive motivational factors differently due to their limited computer or technology efficacies. This research will fill the gaps in the body of knowledge by proposing a motivational model that includes examination on factors influencing continuous use of crowdsourcing platform. This model is an integrated model based on Self Determination Theory and Job Characteristic Theory.

The paper is structured by providing an introduction on crowdsourcing and later follows by explanation of the theories used as basis for the proposed model. Next, an explanation on methodology and analysis is presented. Consequently, the findings are discussed.

2. LITERATURE REVIEW

2.1 Crowdsourcing

Crowdsourcing is defined as “the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call” (Howe, 2006). Crowdsourcing has four main components; crowd workers, crowdsourcing platform, crowdsourcing task and crowdsourcer or job provider (Hosseini et al., 2015). The crowdsourcing platform is an online platform for recruiting and pairing workers with job providers. The job providers use the crowdsourcing platform for advertising their tasks. The tasks typically involved translation, transcribing, data entry and validation, research and other micro tasks.

2.2 Motivational Theory – Self Determination Theory

In order to understand better the motivational factors influencing crowdsourcing participation, we draw literature from Self Determination Theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000). SDT motivation can be broadly divided to intrinsic and extrinsic motivation. Intrinsic motivation implies that people perform an activity because they find it interesting and derive pleasure from the activity itself (Gagné and Deci, 2005). Some personal intrinsic factors shown to influence crowdsourcing are self – Self-affirmation (Zhong et al., 2011) and Killing Pastime (Ipeirotis, 2010; Kaufman et al., 2011). Extrinsic motivation includes economic reward and recognition of competencies by colleague experts.

2.4 Job Characteristics Theory

Besides Self Determination Theory (SDT), job characteristic theory (JCT) has also provided explanation on task related factors that influence people performing work (Hackman and Oldham, 1976). JCT suggested that five work characteristics can influence workers' satisfaction: “autonomy” (i.e., the freedom an individual has in carrying out work),” skill variety (i.e., the extent to which an individual must employ various skills

to perform task)", "task identity (i.e., the extent to which an individual can complete a whole piece of work)", "task significance (i.e., the extent to which a job impacts others' lives)", and "feedback from the job (i.e., the extent to which a job provide information about an individual's performance)". These work characteristics were expected to increase positive behavioral (e.g., job performance) and attitudinal (e.g., job satisfaction) outcomes.

3. MODEL DEVELOPMENT

Based on the results of exploratory study in Ahmad et al., (2017) and with reference to SDT and JD-T theories, a Motivational Model for continuous intention to use crowdsourcing platform among B40 was proposed:

3.1 Fun and Continuous Intention to Participate in Crowdsourcing

Perceived enjoyment or fun is defined as the "extent to which the activity of using a system is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated". Generally, perceived enjoyment, fun, and playfulness have demonstrated to be strong determinants for acceptance to use technology (Davis et al., 1992). In crowdsourcing, several studies demonstrated fun as a significant intrinsic motivation for participation in various crowdsourcing platforms such as creative works/user-generated contents, open innovation, (Brabham, 2012) and also microtask crowdsourcing (Pilz&Gewald, 2013).

H1: Fun is positively related with the continuous intention to participate in crowdsourcing.

3.2 Challenge and Continuous Intention to Participate in Crowdsourcing

Challenge refers to an "individual's wish to improve skills, to enhance knowledge, or to do something intellectually stimulating"

(Spindeldreher&Schlagwein, 2016). In open source literature, intellectual stimulation derived from writing code is one of the strongest predictors to join open source community (Lakhani & Wolf, 2003). There is early evidence showing 'challenge' as an influencing motivation to participate in open innovation crowdsourcing community (Soliman&Tuunainen, 2015). Participants were motivated by tasks that require them to be creative and require unique ideas or solutions to problems (Füller, 2006; Hippel and Krogh, 2003; Morgeson and Humphrey, 2006). In addition to the previous justification, our initial exploratory study (Ahmad et al., 2017) demonstrates that as the workers feel the tasks are not trivial, the higher their continuous intention to participate in crowdsourcing platform. Thus:

H2: Challenging mind is positively related with the continuous intention to participate in crowdsourcing.

3.3 Task Identity and Continuous Intention to Participate in Crowdsourcing

Task identity refers to "the degree to which the job requires the completion of a "whole" and identifiable piece of work - that is, doing a job from beginning to end with a visible outcome" (Hackman & Oldham, 1975). This occurs when a worker performs a task because he/she knows that his work will be used (Kaufmann, Schulze, & Viet, 2011). In finishing the work, the more tangible the result of his/her work is, the higher his/her motivation will be (Kaufmann, Schulze, & Viet, 2011). This study argues that crowdsourcing workers who are fully involved in the tasks will be able to see the output of the task, hence, perceive high task identity. This associate identity with the task will arguably influence the continuous intention to participate in the crowdsourcing:

H3: Task Identity is positively related with the continuous intention to participate in crowdsourcing.

3.4 Task Autonomy and Continuous Intention to Participate in Crowdsourcing

Task autonomy means “the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out” (Oldham & Hackman, 1981). Task of higher autonomy is seen as more meaningful by workers and induce greater feelings of responsibility (Oldham & Hackman, 1981). Previous research has found a positive relationship between task autonomy and intention of participation in the workplace (Morgeson & Humphrey, 2006). In technology adoption literature, task autonomy is one of the task characteristics influencing CRM adoption (I-L Wu & K-W Wu, 2007). Relating with crowdsourcing, as the worker has more control in completing the task, the worker will perceive a higher level of task autonomy leading to higher continuous intention to participate in crowdsourcing platform:

H4: Task Autonomy is positively related with the continuous intention to participate in crowdsourcing.

3.5 Monetary Reward and Continuous Intention to Participate in Crowdsourcing

Payment or monetary reward is one of the factors that motivate members to participate in open source studies (Pilz & Gewald, 2013). Similarly, initial studies in crowdsourcing, demonstrates that the opportunity to gain income is the most dominant motivation to join crowdsourcing platform (Brabham, 2008; 2010). Although reward is associated to high volume of work, but the induced reward does not necessarily correlated with high quality (Mason & Watts, 2009). In this study, monetary reward is expected to significantly influence continuous participation

since the crowdsourcing initiative in Malaysia is targeting the low income group.

H5: Monetary reward will have a positive effect on the continuous intention to participate in crowdsourcing.

4. METHODOLOGY

The population taken for this study is participants of eRezeki Centre who are Malaysian citizens with household income RM 3050/monthly (B40) and participated in E-Rezeki platform. The lowest sample needed for this study is 60 according to guideline by Sideridis et al (2014). A survey link is advertised by the manager of crowdsourcing centers. 134 participants had completed the survey. For items in the survey, constructs are measured using 5-point Likert scale based from literature; Fun (Antin & Shaw, 2012), Challenge (Hackman & Oldham, 1980), Task identity (Hackman & Oldham, 1980), Task Autonomy (Hackman & Oldham, 1980), Monetary (Yin, Chen & Sun, 2014) and Continuous Intention to Participate (Zheng, Li & Hou, 2011).

5. ANALYSIS

The respondents consist of 51 males and 83 females. 38 respondents are between the age of 20 and 25 years old and thirty-six respondents aged between 19 and 21 years old. Monthly income of respondents mostly was around RM 1000 and below. Sixty-six respondents have Bachelor Degree and most categorized themselves as intermediate users.

The model was analyzed using Smart-PLS 3.0. Outer loadings for all reflective constructs met the minimum threshold value of 0.708 (Hair et al., 2014). Table 5.1 displayed the composite reliability and the average variance extracted (AVE) for all measures exceeded the recommended threshold of 0.7 and 0.5 for composite reliability respectively (Fornell and Larcker (1981).

Table 5.1: Composite Reliability (CR) and Average Variance Extracted (AVE)

	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
CHLG_	0.912	0.917	0.934	0.739
FUN_	0.835	0.841	0.901	0.752
CITP_	0.941	0.944	0.955	0.811
MONEY_	0.878	0.889	0.925	0.803
SOCIAL_	0.883	0.893	0.927	0.81
TA_	0.843	0.848	0.896	0.685
TI_	0.854	0.863	0.911	0.773

Subsequently, the discriminant validity of the model was accessed. Table 5.2 indicated that all constructs exhibited sufficient or satisfactory of the discriminant validity using Heterotrait-Monotrait ratio of correlations (HTMT).

Table 5.2: Discriminant Validity Heterotrait-Monotrait ratio of correlations (HTMT)

	CHLG_	FUN_	CITP_	MONEY_	SOCIAL_	TA_	TI_
CHLG_	0.739						
FUN_	0.685	0.752					
CITP_	0.729	0.779	0.811				
MONEY_	0.756	0.682	0.741	0.803			
SOCIAL_	0.533	0.57	0.589	0.619	0.81		
TA_	0.672	0.757	0.675	0.718	0.592	0.685	
TI_	0.741	0.666	0.673	0.727	0.713	0.778	0.773

Note: Diagonals(bolded) represent the square root of the AVE while the off-diagonals represent the correlations

Table 5.3 indicates R^2 of CITP_ (0.637) was above the 0.26 value as suggested by Cohen (1988) which indicated a moderate model.

Table 5.4: Assess the level of R^2 (Coefficient of determination)

	R Square	R Square Adjusted
CITP_	0.637	0.619

In validating the hypotheses, the results of bootstrapping demonstrates only two intrinsic factors challenging mind and fun positively correlates with continuous intention to participate $\beta= 0.23$, $t=2.23$ and $\beta= 0.31$, $t=3.93$. The extrinsic factor, money significantly correlates with continuous intention to participate with $\beta= 0.23$, $t=2.02$.

6. DISCUSSION

Several interesting findings were discovered in this study. In terms of intrinsic motivation, besides fun, challenging mind surprisingly emerged as a significant motivational factor in predicting the intention to participate. The significant role of challenging mind is aligned with a meta analytic review by Spindeldreher & Schlagwein (2016). The challenging element of tasks as drivers for performing tasks can be explained in reference to job design literature. According to job design literature, a boring and monotonous job reduces motivation to perform well while a challenging job increases the motivation of workers. However, our finding must be interpreted with caution. Because our sample is largely dominated by people who have degree/bachelor qualifications, the challenging task may be appealing for them to join the crowdsourcing platform. Additionally, in terms of Internet efficiency, almost all of them are between intermediate and expert users. Hence, they can be considered as tech-savvy people who may look forward to mind challenging tasks. This speculation is also supported by Oldham and Hackman (2010) who realized that not everyone is motivated by challenging jobs. According to them, people who have the knowledge and skill needed to perform the job well and who value opportunities for growth and learning may perceive challenging tasks as motivators for performing the tasks.

The other factor that was found significant both in the meta-analytic review and our study is the monetary reward (extrinsic factor). Similarly, in our study, monetary reward is significant in influencing intention to participate. This finding is not surprising given that the targeted participants for this crowdsourcing platform are the low-income earners. Majority of the participants (40.15%) in this study have monthly income RM 1000 (USD 250) and below. Gaining additional income through crowdsourcing can be seen as one of the strongest predictors for people to join the crowdsourcing platform. Monetary reward has

been cited in several studies as a motivational factor for driving participation in crowdsourcing platform (Brabham, 2010).

Unlike a few of other studies, two intrinsic motivation related to task characteristics are not significant due to some plausible reasons. After re-analyzing the literature, there are some plausible reasons that can explain this finding which are related to the types of crowdsourcing studied and the dynamism of motivational role. Regarding the types of crowdsourcing, except for studies by Kaufman et al., (2011) and Moussawi & Koufaris(2013); the significant role of Task Autonomy and Identity are more apparent in volunteer based crowdsourcing type. We argued that in comparison with payment based crowdsourcing platform, in volunteerism or contest based crowdsourcing, participants are motivated because of their personal altruism and the meaningfulness of the task itself to them. Hence job characteristic factors like Task Autonomy and Task Identity will be more pertinent in influencing their participation (Alam & John Campbell, 2012; Zheng et al., 2011).

Another plausible reason of the insignificant role of job characteristics is related to the dynamics of motivational factors. Dynamism in motivation is demonstrated in volunteers based citizen science crowdsourcing projects (e.g., see Rotman et al, 2012). In another study by Jackson et al., (2015) demonstrate the dynamism of motivational factors. According to them, only in later stages of participation in the crowdsourcing project Task Autonomy emerge as one of the factors that influence sustained participation. There were three stages of involvement; initial, active and sustained. As for the initial stage, personal interest based intrinsic factors like altruism strongly influence their participation. In the second stage reputational extrinsic factors like achievement and ranking are more pertinent as factors influencing participation. In the third stage, a balance of both intrinsic and extrinsic motivations facilitated their sustained participation

over time. Thus the dynamic changes in motivational factors over time were critical in this crowdsourcing project.

7. CONCLUSION

In conclusion, this study provides empirical evidence on the role of intrinsic and extrinsic motivational factors influencing continuous use of crowdsourcing platform. Future research may want to examine the temporal dynamics of the motivational factors and their importance in influencing continuous use. Additionally, moderating factors may be included to provide better explanation such as the Internet efficacy, gender, goal orientation and other related contextual factors. As for the extrinsic, reward emerge as the sole extrinsic motivational factor for the context of this study.

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