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Kevin Cupido

Jacques Ophoff

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A Conceptual Model of Critical Success Factors for an e-Government Crowdsourcing Solution

Kevin Cupido, Jacques Ophoff

Dept. of Information Systems, University of Cape Town, Cape Town, South Africa

kevin.cupido@gmail.com

jacques.ophoff@uct.ac.za

Abstract: Most e-Government implementations have resulted in failures with many implementations being one-way (government-to-citizen) and mainly informational (Dada, 2006; Cloete, 2012). However, advances in technology provide governments with the opportunity to engage with citizens using new methods, such as crowdsourcing. Successful commercial and open source software implementations of crowdsourcing have sparked interest in its potential use in the public sector. Brabham (2009) advocated for the use of crowdsourcing in the public sector to increase public participation and for governments to access citizens as a source of ideas and solutions.

However, crowdsourcing lacks a theoretical and conceptual foundation (Geiger, et al., 2011; Pedersen, et al., 2013). Within e-Government there is also a lack of knowledge regarding the implementation of crowdsourcing platforms (Koch & Brunswicker, 2011). The main research questions is: How are crowdsourcing initiatives able to motivate citizen participation in e-Government?

A conceptual model of critical success factors for an e-Government crowdsourcing solution is presented, based on a comprehensive review of relevant literature. The model uses Self-Determination Theory as a basis to examine citizen motivation and the influence of incentives or rewards. The model also addresses system factors such as task clarity and types, management, and feedback. The model examines behavioural intention to use crowdsourcing through the Unified Theory of Acceptance and Use of Technology. In order to explore this model a sequential explanatory mixed-method approach will be adopted with a quantitative survey, followed by qualitative semi-structured interviews to add richness to the quantitative data. This research benefits future work by building a conceptual foundation for a potential e-Government crowdsourcing solution.

Keywords: Crowdsourcing, e-Government, critical success factors, conceptual model, Self-Determination Theory, citizen participation, democracy, mixed methods

1. Introduction

Involving all citizens in decision-making has eluded governments around the world (Brücher & Baumberger, 2003). For many citizens participation amounts to voting, with few partaking in government public participation initiatives, creating the general belief in citizen apathy. However, apathy is not the reason for low participation – rather citizen participation has changed in that citizens participate in different ways and on their own terms (Bang, 2009).

One of the ways is to leverage advances in web technologies such as Web 2.0, which allowed for greater user-generated content and, combined with the widespread availability of internet-enabled mobile technologies, have made it even easier for people to connect and collaborate. Realising this potential, businesses have used these technologies to tap into ‘crowds’ of people as a source of ideas, and for problem solving (Howe, 2006). Crowdsourcing using web technologies accesses the potential of a large network of people who respond to calls towards the completion of tasks, or offer ideas and solutions to problems posed (Geiger, et al., 2011). Different crowdsourcing systems use incentives as motivation, whereas others are driven by individual, social, or personal values and principles. The aim of this research is to determine what factors would influence public-sector crowdsourcing initiatives for citizen participation in government. This research will attempt to answer the question: What are the critical success factors for an e-Government crowdsourcing solution?

This paper proceeds with a discussion of e-Government and technology, before looking at crowdsourcing as a concept. It then examines various factors that could influence a crowdsourcing solution including motivation, rewards, tasks and management. Next the conceptual model is presented which draws the factors together. Finally some concluding remarks end the paper.

2. Citizen participation in government

Uncertainty of how to contend with the increased complexity in modern-day governing has led governments to exclude citizens from the deliberation process (Li & Marsh, 2008). The political scientist

Henrik Bang describes the emergence of two political identities, the 'expert citizens' and 'everyday makers' as a response to this exclusion. Expert citizens are involved and interested in politics and often speak on behalf of the everyday makers, many of whom are less privileged (Marsh, 2011). Williams (2006, p. 197) equates community participation to "spectator politics, where ordinary people have mostly become endorceses of pre-designed planning programmes". A possible way to address the above issues is the use of technology through e-Government.

2.1 e-Government and technology

E-Government refers to the use of technology to deliver information and services and enable digital interactions between government and other parties, such as citizens. Unfortunately many e-Government implementations have been total or partial failures, either abandoned or not achieving their intended goals. Many implementations are still one-way, government-to-citizen (G2C) in nature and mainly informational (Cloete, 2012).

According to Dada (2006, p. 4) there is a need for the public sector to "change and reengineer" its processes to the new technology and culture of e-Government system functions; one reason for e-Government failure is a "mismatch between the current reality and the design of the future e-Government system". Brabham (2009) also viewed the web as a means to reduce the constraints placed on citizen participation in democracies. Citizens have embraced the 'democratised' web offered by Web 2.0, which allowed for user-generated content, where consumers also became producers and publishers.

Citizens are already utilising technology to engage in 'alternative' ways through blogs, forums and on social networks (Bang, 2009). Some extreme uses of technology has led to the unseating of the Egyptian president, through extensive use of Facebook and Twitter for citizen reporting and the coordination of efforts (Cloete, 2012). Similarly, citizens have used the short message service (SMS) to organise demonstrations in the Philippines and Syria, and Blackberry messaging (BBM) has been used to coordinate riots in the United Kingdom. During the 2008 Obama election drive in the United States of America (USA) citizens interacted via social networks including the raising of election funds. What these examples illustrate is that technologies have allowed for a vast number of people to be mobilised.

As technology is a facilitator between government and citizens it is expected that advances in information and communication technologies (ICT) would increase the potential of crowdsourcing initiatives. The successful use of crowdsourcing concepts to engage large groups of people has ignited interest in its potential to mobilise citizens, and Brabham (2009) has advocated the use of crowdsourcing concepts in the public sector to not only increase public participation, but also for governments to access citizens as a source of ideas and solutions.

2.2 Crowdsourcing

As a concept crowdsourcing is not new – the term was coined by Howe (2006) and described as a means to outsource a function, previously performed by someone internal to an organisation, to a larger network of people in the form of an 'open call'. The primary components of crowdsourcing are that of the organisation, the crowd itself, and a platform to "link the two together and to provide a host for the activity throughout its lifecycle" (Zhao & Zhu, 2012, as in Seltzer & Mahmoudi, 2012, p. 194). The organisation component in this context is government, the crowd component refers to citizens as part of an online community, and the platform is the technology which plays a vital role as facilitator.

Estellés-Arolas & González-Ladrón-de-Guevara (2012) list forty different definitions, and even the word 'crowdsourcing' itself is sometimes used in the same breath as many others such as 'co-creation', 'open innovation', and 'citizen-sourcing'. One definition that is a good fit for the use of crowdsourcing in a public participation context is that, "It involves an organisation-user relationship whereby an organisation executes a top-down, managed process that seeks the bottom-up, open, creative input of users in an online community", and it is this management that makes it "productive and full of potential to do good" (Brabham, 2013, p. 127). Charalabidis et al. (2012) and Bani (2012) mention the use of an unstructured approach, such as the use of social networking tools by citizens in Iceland to craft their constitution. However, the use of social networking can generate unanticipated outcomes and serve to disrupt participation by others, as well as a loss of control over the process (Cobo, 2012). This definition then distinguishes a government-based crowdsourcing as being a more deliberate process, and may have greater appeal to governments, being bureaucratic and more process-driven.

Crowdsourcing types range from *crowd rating* (a simple voting system) akin to a poll or Facebook Like, and *crowd processing* (micro tasks motivated by a financial reward), to the more complex types of *crowd solving* and *crowd creation* which require idea generation and collaborative problem-solving. Depending on the application the four types often appear in various combinations. The options within a government context would range from gauging sentiment through a simple opinion poll (crowd rating), distributed task processing (crowd processing), to knowledge gathering and creation (crowd solving and crowd creation), or combinations thereof. A process of idea generation through crowd solving followed by crowd rating would accommodate different 'levels' of citizens, but more importantly by being inclusive it would also assist in gaining buy-in and legitimacy. However, current government implementations of crowdsourcing just give a "semblance of participation but does not promote collaboration" (Warner, 2011).

While crowdsourcing has emerged as a low effort and low cost way of eliciting ideas from a vast number of people (Leimeister, et al., 2009), the initial problem is how to 'kick-start' the crowd as well as how to grow a vibrant community (Brabham, 2009). Understanding the motivations for participation in crowdsourcing systems is key to the development of "best practices for governments and non-profits hoping to take the genius of crowdsourcing further into the service of the public good" (Brabham, 2010). However, there is a lack of knowledge as to the implementation of a government crowdsourcing platform and the motivation for individual participation (Koch & Brunswicker, 2011).

3. Self-determination theory and motivation

Ryan & Deci (2000, p. 54) state that "to be motivated means to be moved to do something", or moved into 'action'. Self-Determination Theory (SDT), defines different types of motivation (see Figure 1). It ranges from unwillingness manifested in amotivation, extrinsic motivation which is related to passive compliance, and personal commitment in the form of intrinsic motivation. The continuum is also an indication of levels of internalisation increasing from left to right, which is the process of adopting a value or regulation, and the degree to which this has been integrated to be a part of the self (Ryan & Deci, 2000).

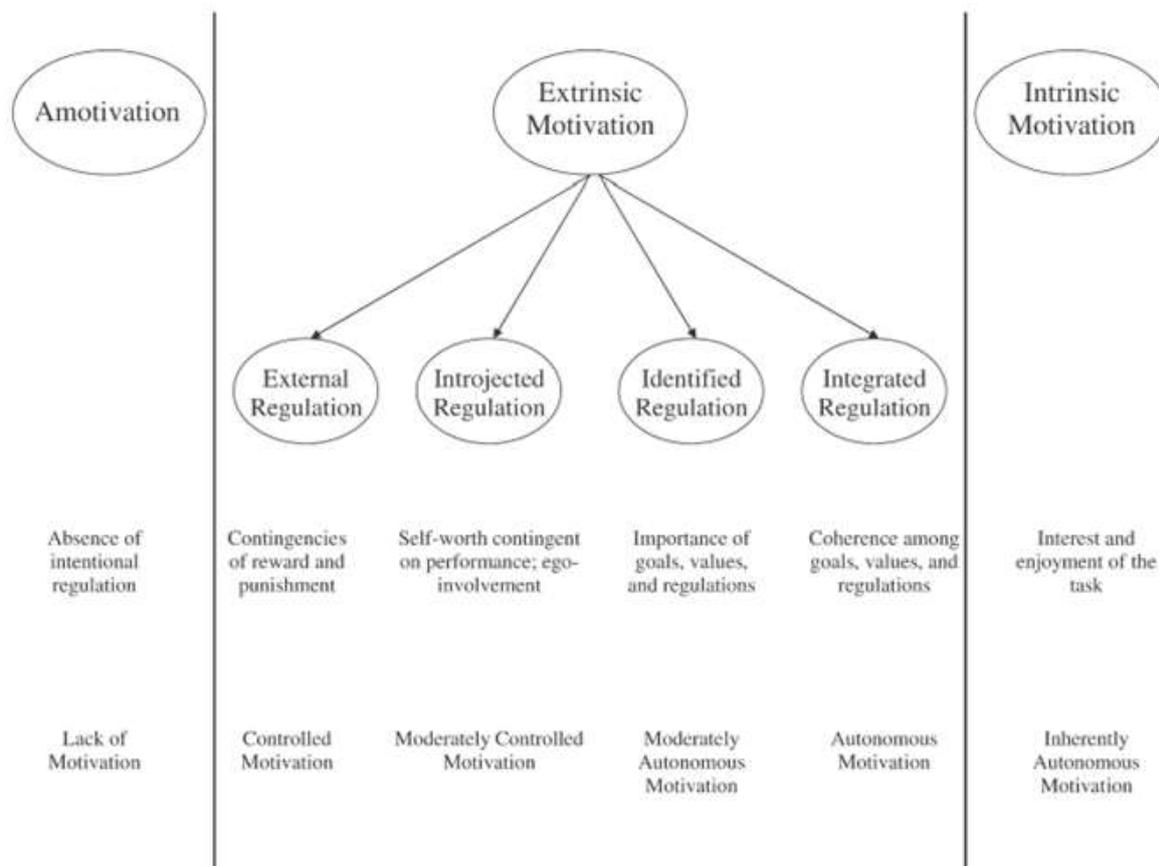


Figure 1: Self-determination continuum (Gagne & Deci, 2005)

Amotivation is the least self-determined, and is associated with a lack of intention to act. This comes about as a result of not valuing an activity, not feeling competent to do it, or not believing it would amount to anything (Ryan & Deci, 2000). On the other end of the scale, intrinsic motivation refers to being driven internally or from the 'inside', where autonomy and internalisation are at their peak and relates to an individual drive to do something because of enjoyment or satisfaction. For an individual, autonomy denotes choice and therefore being in control.

Extrinsic motivation is divided into types of behaviour regulation, being that of external, introjected, identified, and integrated. An example of external regulation would be the need for incentives or reward as 'encouragement' to perform a task (Kauffmann & Schulze, 2011). Internalisation of behaviour regulation occurs when external regulation of behaviours and their associated values no longer require the external stimulus. Introjected regulation is, "internalised extrinsic motivation" (Gagne & Deci, 2005, p. 334), where a behaviour regulation is taken in but is not accepted as one's own (Ryan & Deci, 2000). This would lead someone to take action because of internal pressure based on ego or the desire to increase self-worth. Identified regulation is when more autonomy is perceived even though an activity may not be intrinsically motivating. This is a sense that the activity resonates with internal values and goals, an understanding and attached importance to performing an activity. With integrated regulation this association with values and goals goes deeper, beyond just awareness and importance of the behaviour to it being perceived as a reflection of the self, or 'who you are'. Extrinsic motivation reduces autonomy, but as extrinsically motivated behaviours are internalised, they become more self-determined, and being more self-determined equates to a feeling of being 'in control', and greater feelings of autonomy (Ryan & Deci, 2000). Internalisation also increases with feelings of competence, or the ability to perform, and relatedness which is the individual association with a group or community.

Within a crowdsourcing system, some tasks may be both intrinsically and extrinsically motivated. Different crowdsourcing systems use incentives as motivation, whereas others are driven by individual, social, or personal values and principles.

4. Rewards

Batson, Ahmed & Tsang (2002) presents a 'rewards' perspective divided into *self, social, or material*. This would include upholding of self-esteem, recognition, status, praise and payment or prizes. Batson et al. (2002) notes that these are not exclusive categorisations as even though individuals may be driven by self-interest, the result of their actions could also have some 'unintended' benefits for the group or community.

4.1 Self

Some individuals are driven by self-interest, whether that is for pure enjoyment, recognition or financial gain. Batson et al. (2002) argue that individuals exhibit other motives such as altruism, collectivism and principlism, with principlism relating to aspects such as justice. Altruism is described as the motivation to assist others more broadly, on an individual level, whereas collectivism is characterised by a greater preference for a particular in-group. However, altruism is seen a means to gain an internal rather than external reward, by feeling good about oneself, or to avoid negative feelings such as guilt. Vassileva (2003) mentions that the use of emotions such as guilt, a sense of belonging and relatedness, or owing, could help to kindle feelings of altruism which can drive an individual to action. However, the intentions for altruism are not always clear and as such can encompass both self and social rewards.

4.2 Social

Henn et al. (2007) suggest that a strong positive relationship exists between social capital and civic attitudes. Strong or weak ties between individuals create trust networks, described using social capital (Putnam, 2000). Stronger ties are bonding relationships between homogenous groups, typically between family or close friends, characterised by frequent contact and high levels of trust. Bridging relationships on the other hand are between heterogeneous groups where there is less contact and consequently lower trust. Power relationships or linking social capital are vertical connections such as those between different socio-economic groups, or a link from citizens to government. The motivation to participate is greater if 'significant others' highlight the importance of an activity. Hence participants seek approval and in addition it promotes a 'sense of belonging', or 'sense of relatedness' in SDT terms and facilitates internalisation (Ryan & Deci, 2000). These significant others are those with whom there are close relationships and would include family members, friends, or other close members within the online community (Leimeister et al., 2009; Vassileva, 2003).

It should be noted that self and social motivations are not mutually exclusive as, “the decision to participate in politics may be motivated by both a desire to make things better for everyone (altruism) and a desire to specifically acquire as many benefits as possible for an ingroup (social identification)” (Fowler & Kam, 2007, p. 816).

4.3 Material

A common crowdsourcing process would be to put out a call for ideas or solutions to a stated problem with the motivation to participate being a bounty or prize. “The crowd-sourcing model is faced with a question that has long concerned economists, psychologists, and management theorists; that is, whether and how financial incentives can be used to motivate workplace performance” (Mason & Watts, 2010, p. 100). Leimeister et al. (2009) mention that motivation to participate comes about with the right mix of incentives. Bayus (2013) notes that in the case of financial incentives one large prize would attract those who were prepared to put in the most effort, which typically turns out to be those who were more skilled. On the other hand those who were less-skilled put in more effort when there were several smaller prizes. Yet, the creativity of submissions was not affected by the size of the prize at all, and despite a large number of entries, a single large prize resulted in fewer creative ideas.

Lakhani & Wolf (2005) note that both intrinsic and extrinsic motivations appear to be balanced within OSS projects. Pedersen (2013) also reports a study in which a purely intrinsic-driven crowdsourcing initiative resulted in only 35% of tasks being completed, concluding that some form of extrinsic motivation (external regulation) may still be required. Whereas the other ‘internalised’ extrinsic motivators besides external regulation may be more desirable, financial rewards cannot be ruled out as a mechanism to drive participation.

5. Task purpose and type

As indicated in SDT, a goal is only internalised when it is both understood and the person has the necessary ability or competence in order to achieve it (Ryan & Deci, 2000). According to Brabham (2008) and Pedersen et al. (2013), the success of crowdsourcing solutions are dependent on the clarity of tasks or activities, and even extrinsic motivations would fail to drive participation if tasks or activities were poorly designed (Skinner, 2009). Leimeister et al. (2009) indicate that design plays an important part in the successful implementation of a crowdsourcing competition or challenge. Pedersen et al. (2013, p. 7) mention that “a positive user experience is a strong predictor of continued involvement” for participants in a crowdsourcing system.

Design refers to aesthetics as well as the design of the challenge or campaign and of external incentives which can have an effect on motivation (Kauffmann & Schulze, 2011). Design considerations that would support this include planned processes with clear descriptions of purpose and tasks. A process consists of steps that have to be taken in order to arrive at a certain outcome or result (Pedersen et al., 2013). These can range from simple tasks such as idea gathering to more complex collaborative activities. Failure to implement clearly defined processes can lead to confusion or a perception that the system is not useful and could lead to amotivation. Citizens also need tasks that they feel comfortable and competent at performing, otherwise it could also result in amotivation (Elliot & Dweck, 2005).

Poetz & Schreier (2012) distinguish between needs-based and solutions-based enquiry. Needs-based would be in the form of a request for a list of problems or issues which may not have been addressed. A crowd-rating stage may follow, to identify the most pressing or popular items, and the solution itself may then still be left up to government. Conversely, tasks or challenges that request solutions may require a citizen with a different level of knowledge. Some commercial crowdsourcing solutions restrict the more collaborative types such as crowd-creation to ‘expert’ citizen, who are believed to have specific domain knowledge. This may be sensitive within a public participation context as it could be seen to mirror the kind of exclusion that exists in real-world participation alluded to by Bang (2009).

For some citizens participation would mean being part of a collaborative process. Some may be content with posting ideas while for others participation would be the means by which they can cast their vote on issues. A crowdsourcing system therefore needs to cater for different levels, or grading, of tasks so that it is as inclusive as possible, empowering a wide spectrum of citizens in the process.

6. Management and feedback

Although excessive control is not desirable, a lack of governance can make the system uncontrollable. Jain (2010) advises that appropriate mechanisms be put in place to ‘steer’ the crowd, helping to

maintain focus towards the completion of tasks. In this regard, some lessons can be learned from Communities of Practice (COP), which are voluntary associations between individuals with a common interest. In COP individuals feel that they could derive some value from association with others and therefore share learning. For an organisation COP are to be supported as it helps individuals perform better. However, as it is not a formal structure it is better facilitated than managed or controlled, otherwise “they lose their unique identity and cease to function as self-organising COP” (Grant, Hackney & Edgar, 2010, p. 227). As with the experience of COP, a balance is needed that allows for freedom of expression while maintaining a certain level of control. Agreed rules and policies also facilitate trust between participants as well as in the system (Leimeister et al., 2009; Preece & Shneiderman, 2009). Failure to implement these would “destabilize an online community and interfere with the problem solving abilities of the crowd” (Brahman, 2009, p. 257). Effective stewardship would allow the crowdsourcing initiative to proceed with a purpose so as to achieve the desired outcomes.

Continued future participation has been related to the feedback provided to participant contributions and motivation is driven by the desire for recognition and status (Halavais, 2011). Wanting recognition is an important motivator for individuals (Lampel & Bhalla, 2007). Other motivators would include community visibility of contributions and recognition for the quality and quantity of individual contributions (Preece & Shneiderman, 2009). This underlines the importance of system features and mechanisms that allow for feedback and recognition. An effective mechanism would not only facilitate individual self-esteem and confidence but also social visibility. Besides direct individual feedback the motivation to continue in a public participation crowdsourcing initiative would be negatively affected if results or benefits were not reflected in the real-world (Warner, 2011; Lampel & Bhalla, 2007).

7. Conceptual model

The topics discussed above are combined in a conceptual model, presented in

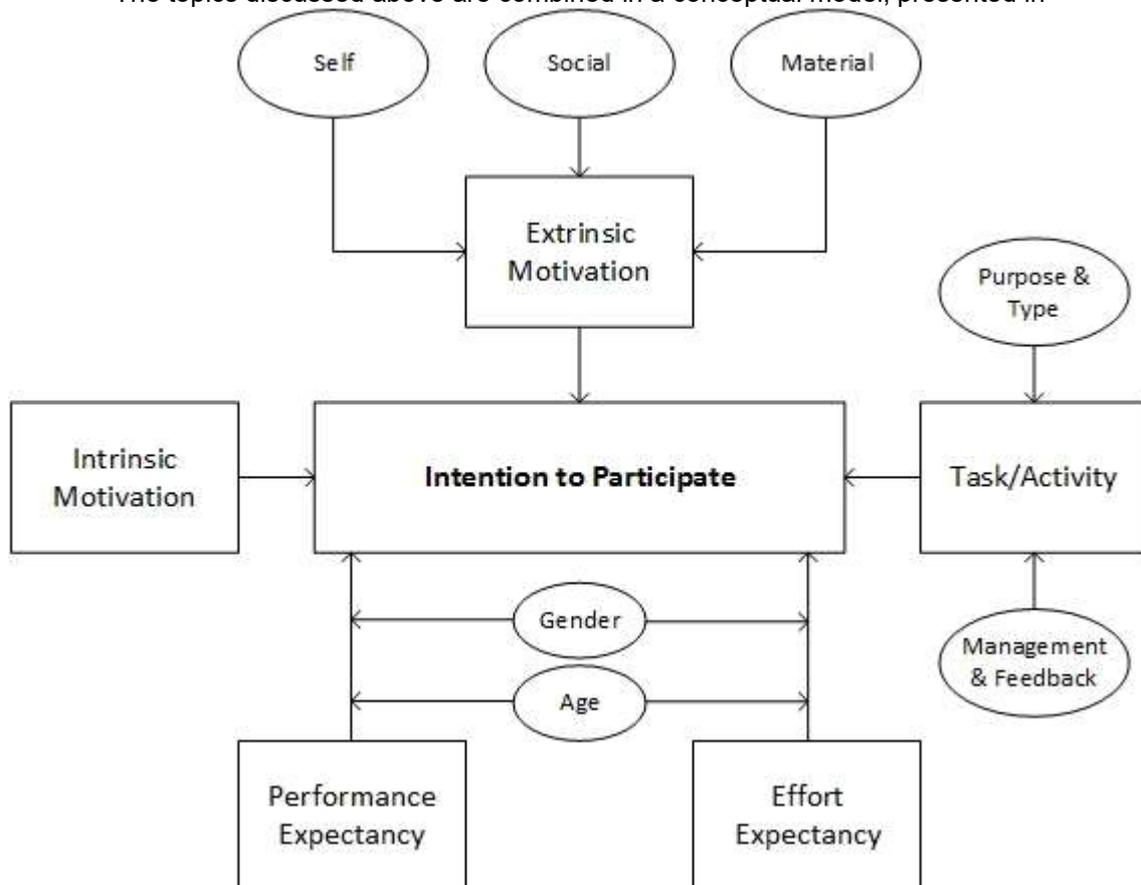


Figure 2. The model presents the critical success factors for an e-Government crowdsourcing solution and shows the relationship between factors. The factors of intrinsic motivation, extrinsic motivation, and task were derived from the reviewed literature.

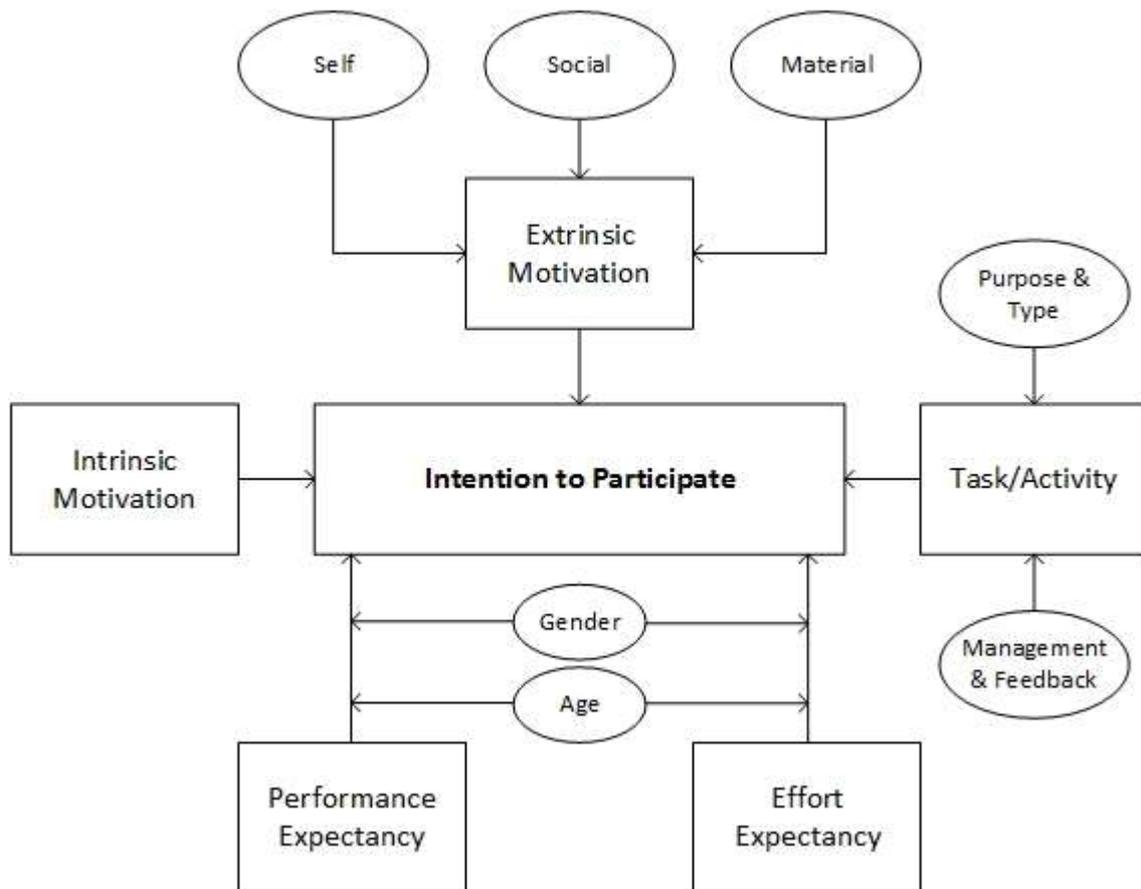


Figure 2: Conceptual model of critical success factors for an e-Government crowdsourcing solution

Two additional factors, performance expectancy and effort expectancy, are derived from the Universal Theory of Adoption and Use of technology (UTAUT). Performance expectancy refers broadly to perceived usefulness and the degree to which a person believes the system will be beneficial. In the UTAUT it is considered to be the strongest predictor of intention to use a technology (Venkatesh, et al., 2003). Effort expectancy is the “degree of ease associated with the use of the system” (Venkatesh, et al., 2003, p. 450).

It is noted that both performance expectancy and effort expectancy will be moderated by gender and age (Venkatesh, et al., 2003). Within the UTAUT these are both predicted drivers of behavioural intention, which is referred to as ‘Intention to Participate’ in the model.

8. Conclusion

Successful implementations of crowdsourcing within the non-government space has managed to mobilise large numbers of people and thus it offers the possibility of addressing citizen ‘apathy’ and tapping citizen ingenuity. Although there has been some experimentation, the lack of government use of crowdsourcing could in part be the result of a lack of management and skills to correctly implement e-Government initiatives. Another reason could be the lack of a suitable platforms either because they are inaccessible to the majority of citizens, or because they are not suitable for crowdsourcing initiatives. Although it may at first seem an obvious choice, social networking platforms such as Facebook, which is privately owned and unregulated, would have to address issues around control and privacy as well as other system-related issues such as workflow, tasks, management, and mechanisms for incentives and feedback (Cobo, 2012).

This research assimilates prior research on crowdsourcing-related issues into a conceptual model, proposing critical success factors for a potential e-Government crowdsourcing solution. While information systems are typically envisaged to support operations, provide structure, or manage processes, this research highlights the importance of including mechanisms to facilitate and increase motivation. A quantitative study would assist with a broad understanding, though it cannot answer

deeper 'why' questions. Brabham (2010, p. 1128) calls for more crowdsourcing cases to add "rich qualitative data... to the stable of research on the crowdsourcing model, all with the intent to develop best practices and core findings for use in government". A mixed-methods sequential explanatory design is suggested going forward.

A citizen shift from a 'once-off' election mind-set to one of 'on-going' participation would require changes in government employee mind-set and skills, as well as changes to existing structures and processes. This highlights a limitation of this research in that it is wholly focused on the mechanisms to increase citizen participation and does not explore the impact of crowdsourcing on government structures. Future research should address the government perspective, as it would require a shift from traditional bureaucratic processes and require government officials with different skillsets. A proposed model could assist by providing guidelines for conducting a crowdsourcing initiative implemented on existing platforms, or highlight system features required in a new system build.

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