User Participation and the Success of Development of ICT4D project: A Critical Review

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ABSTRACT

"Involve target groups in project design and monitoring". This is the first of five points of lesson-learned from a detailed review commissioned by InfoDev of a cross-section of 17 of the more than 100 ICT4-for-Development (ICT4D) pilot projects it has funded in the past several years in preparation for the World Summit on Information Society (WSIS) in Geneva-2003 (InfoDev, 2003). Yet, since the publication of this report, there are still conflicting arguments among ICT4D practicioners and researchers regarding the positive impact of user participation on the success of development of ICT4D project. This paper reviews the existing ICT4D studies that discuss this issue and offer suggestions for the future research.

Keywords: User Participation, ICT for Development, Developing Countries

INTRODUCTION

The beginning of the 21st century marks the efforts by governments, donor agencies, and academics around the world to implement digital inclusion project or widely known as the ICT-for-Development (ICT4D) project with intention to realising benefits offered by ICT to the socio-economic development of the society (Avgerou & Walsham, 2000b; Unwin, 2009; Walsham, Robey, & Sahay, 2007; Warschauer, 2004). Such projects were intended to promote integration of Information and Communication Technologies (ICTs) into existing community

practices with aims on improving communication, learning processes, and information exchanges between the communities as well as with other inter-related stakeholders (i.e. Government, Universities, Non-Government Agencies, and Private sectors) in every areas of social-economic activities either locally, regionally, and worldwide (Avgerou, 2003; Harindranath & Sein, 2007; Heeks, 2002).

There is general consensus among researchers that ICT4D project requires participation from all groups within a particular community so that it can provides the technological innovations that can benefit all groups of communities (S. Bhatnagar, 2003; Colle, 2005; R. W. Harris, Kumar, & Balaji, 2003; Oestmann & Dymond, 2001; Roman & Colle, 2002). A digital inclusion project needs to provide relevant content and services, which can support social and economic activities of the community where it serves. Yet, relevant content and services will need input from relevant individuals within the community. Colle (2005) argues that participation is important because "it conveys the sense of community ownership…it helps reflect community values and will help us identify information needs (p. 9). Benefits of user participation in the development of ICT4D project according these studies are including: Better understanding of community needs and requirements, foster learning, knowledge sharing and innovation, faster technology diffusion, overcome social inclusion, and increase the likelihood of the sustainability of the project (Damodaran & Olphert, 2006).

Yet, there are others who caution that such predicted impacts are often superficial (Bailur, 2008; Heeks, 1999; Ramirez, 2008). It is argued that the term participation or engagement was often used only to satisfy requirement of donor agency. This paper is set to clarify this on-going debate by critically review how the relationship between participation and its impact on the success of ICT4D project has been studied in ICT4D research. The remaining of the paper is organised as follows. It begins by briefly describe overview of IS and HCI research in addressing the issue of user participation Information Systems Development (ISD). It then discusses how the issue has been discussed in ICT4D research as the sub-field of IS and HCI, by first explaining *two different discourses* taken by ICT4D researchers with regards to applying theories, knowledge, and best practices from general IS and HCI. The combination of research areas and discourses in theory building offers four distinct types of studies in investigating the link between user participation and the success of development of ICT4D project. Each of the distinct type of studies is then discussed. The review points out to several suggestions for future research.

RESEARCH ON USER PARTICIPATION

Research in information systems (IS) has shown that higher level of user participation in Information Systems Development (ISD) leads to a higher chance of system success (Cavaye, 1995; He & King, 2008; Hwang & Thorn, 1999; Ives & Olson, 1984). It is therefore important to improve user participation in ISD. The similar issue is now faced in the development of ICT4D projects (Heeks, 1999; Ho, Smyth, Kam, & Dearden, 2009). Participation from target users in development of such project is not only important to project-related success but also to the individual/attitudinal outcomes with regards to the ICT and Development (Avgerou, 2008; Ho, et al., 2009).

The term participation generally means a process by which enabling people to realize their right access information relating to and involve in the decision-making processes which affect their lives (Paul, 1987). Information systems literature defines user participation as "the behaviours and activities performed by the target users or their representatives during ISD process (Barki & Hartwick, 1989, p. 59). The term, however, also have several attributes (Cavaye, 1995). Participation has different *degrees,* including information, consultation, and joint decision-making. It can also occurs during different stage of project implementation (*extent*), for example during project planning/design phase, building phase, implementation phase, or evaluation/review phase. The *type* of participation may include all users, or only the representatives of users. And the *content* of participation may include technical, social, or both.

Participation from the target users in ISD has been the core topic of Information Systems and Human Computer Interaction (HCI) research since 1960s (Swanson, 1974). In IS research, the studies have been greatly influenced by organisation behaviour research, particularly Participative Decision Making (PDM) research (Ives & Olson, 1984) as IS research generally considers user participation as "a special case of PDM in which system developer and users substituted for superiors and subordinates" (Ives & Olson, 1984, p. 587). On the other hand, the studies on user participation in HCI research come from two key streams of literature: Participatory Design (PD) and User-Centric Design. Although both IS and HCI research offer a fundamental understanding of user participation issue they are not easily integrated as they are not 'commensurate on goals, philosophical perspectives, methods and findings' (Mao & Markus,

2004, p. 202). The IS research acknowledge the issue and offers "what" needs to be made in light of changing technological and managerial conditions. At the same time, the HCI research also acknowledges the same issue and but instead offers "how" (or better ways) to conduct participation process.

Table 1   Different focus on user participation study

IS Research	HCI Research	
	Participatory Design (PD)	*User-Centric Design (UCD)*
Originally motivated by the organisational factors	Originally motivated by the political factors	Originally motivated by the economical factors
Based on organisation behaviour studies, particularly PDM	Based on the Scandinavian approach in systems development and the UK socio-technical approach	Based on the North America approach in system (software/hardware) development
Focus on the explaining the impact of user participation to IS success in organisation	Mainly contribute to influence participation practices by proposing participatory system development methodologies.	Mainly contribute to influence participation practices by proposing participatory system development methodologies.
	Literature provides philosophy and principles but little procedural guidance	Little in academic literature but provide procedural guidance

As shown in Table 1, studies in IS research have been greatly influenced by organisation behaviour research, particularly PDM (Ives & Olson, 1984). It primarily motivated by organisational factors as organisation behaviour research argued that involving employees in the decision making process will increase the acceptance and commitment to the decision making results including decision about technical innovations (e.g. (Locke & Schweiger, 1979; Vroom & Yetton, 1973)).

In HCI research, two streams of literature have emerged to discuss the user participation issue: Participatory Design (PD) and User-Centric Design. The former is originated from Scandinavian approach in systems development at workplace setting, especially in highly unionised workplace context, which was designed to encourage democracy at the workplace setting (Muller, Haslwamter, & Dayton, 1997; Schuler & Namioka, 1993). The approach later adopted into the socio-technical approach of systems development which was popular in the UK (Land & Hirschheim, 1983; Mumford, 1983). This stream of studies has been primarily aim to influence participation practices. Notably some of the popular participatory system development methodologies have been proposed, which can be used to apply participatory principles for a

particular stage or for whole stages of system development cycle such as ETHICS (Effective Technical and Human Design of Computer-Based Systems) (Mumford, 1983), Multiview (Avison, Wood-Harper, Vidgen, & Wood, 1998), or Joint application design (JAD) (Carmel, Whitaker, & George, 1993; Davidson, 1999). For a complete list of systems development methodologies, see for example (Muller, et al., 1997).

User-Centric Design (UCD) in HCI research is also aimed primarily to influence participation practice. It originated from the North American approach of software development. It is however originally motivated by the desire to find effective and efficient way to design a highly quality of hardware and software. It is argued that the users are the best source of the design knowledge than the designers ever could. In recent years, UCD principles have been incorporated into ISO13407 documents who advocates user involvement and iterative design and evaluation (ISO, 1999).

USER PARTICIPATION IN THE DEVELOPMENT OF ICT4D PROJECT

The issue of user participation in development of technological innovation for the purpose of social-economic development began to gain attention among ICT4D researchers since the beginning of the 21st century. Much of these works was published in the proceedings of the series of conferences on ICT4D organized by the *International Federation for Information Processing (IFIP) Working Group 9.4* (Avgerou & Walsham, 2000a; S. C. Bhatnagar & Bjorn-Andersen, 1990; S. C. Bhatnagar & Odedra, 1992; Byrne, Nicholson, & Salem, 2010; Krishna & Madon, 2003; Odedra-Straub, 1996; Roche & Blaine, 1994; Sahay & Avgerou, 2002), ICT4D journals including: *The journals Information Technology for Development (ITD), Information Technologies and International Development (ITID), and the Electronic Journal of Information Systems in Developing Countries (EJISDC).* In addition, several general IS journals and conference increasingly acknowledge this sub-field by having special tracks and producing special issue in this area (Sahay & Avgerou, 2002; Walsham & Sahay, 2006). In HCI research, there has been increasing interest towards research on Human-Computer Interaction for Development (HCI4D) in the last ten years (Toyama, 2010). Started in 2003 with publication of a special issue of ACM *interactions on HCI* on developing world (Dray, Siegel, & Kotze, 2003).

This was followed by a series of workshops at major international conferences (e.g., INTERACT '07/'09, CHI '07/'08/'09, HCI '07, DIS '08, PCF5) over the decade.

Theory building in ICT4D research on user participation in ISD follows two different "discourses". Here the term *discourses* refers to "the research approaches stemming from different assumptions on the fundamental nature and consequences of IS innovation" with regards to the relevancy between general IS and HCI research knowledge and good practice models (methods, analytical methods, frameworks, or theories) for the context of ICT4D research (Avgerou & Walsham, 2000a). The realization of the context sensitivity in ICT4D research in establishing its relevancy as as a sub-field of IS and HCI research give rise to two important discourses: (1) *Transfer and Diffusion* and (2) *Social Embeddedness* (Avgerou, 2008, 2010).

The *transfer and diffusion discourse* assumes that the techniques, knowledge, and good practice models that comprises general IS and HCI technologies and associated organizational practices are adequately independent from social circumstances where such entities was raised. Consequently, this perspective assumes that subject to suitable *adaptation* such entities can be transferable into context of ICT4D research. The adaptation tries to capture the difference between the context such as economic conditions, technology competences, culture, people's attitudes to IT and so on (Bada, 2002; Walsham, 2000).

In contrast, the *social embeddedness discourse* challenges the assumption of the *transfer and diffusion perspectives* and find it oversimplifying. Instead, the discourse views that technological development and usage in ICT4D context is about constructing new knowledge and practices based on the local social context. Through more *inductive approach,* this discourse attempts to construct cognitive, emotional, and political practices that individual nurtured in their *in situ* environment when dealing with any technological innovation attempts (Miscione, 2007).

FOUR-TYPES OF STUDIES

Combination between two area of studies and two discourses in theory building within ICT4D project yield four distinct types of studies that investigate the participation and success link. Table 2 summarises these four types of studies along with example of studies for each type derived from existing literature. Also, it is important to mention that, In research on user

participation within ICT4D research that inspired by HCI research, this paper will focus only on studies from IS research and participatory design research. As argued, the UCD in HCI research mainly focus to offer strategies for eliciting feedback and secures participation from the target users for design of particular hardware/software. However, as mentioned before, there are vast literature in this stream of research, for example see the special issue on HCI-for-Development (HCI4D) in Journal of Information Technologies and International Development (ITID) (Ho, et al., 2009)

Table 2 Four distict types of study in investigating the link between participation and success of ICT4D project

Area of research	Transfer and Diffusion Discourse Example of studies:	Social Embeddedness Discourse Example of studies:
Information Systems	(Bailur, 2007b; Puri & Sahay, 2007)	(Bailey & Ngwenyama, 2011; Bailur, 2007a; Kanungo, 2004; Puri & Sahay, 2003a, 2003b; Van Belle & Trusler, 2005)
HCI (PD)	(Byrne & Sahay, 2007; Merkel et al., 2007; Puri, Sahay, & Lewis, 2009)	(Braa, Hanseth, Heywood, Mohammed, & Shaw, 2007; Braa & Hedberg, 2002; Braa, Monteiro, & Sahay, 2004; Byrne & Alexander, 2006; Miscione, 2007)).

In addressing the issue participation in development of technological innovations in ICT4D context, researchers have taken both discourses. Within ICT4D research that follows IS tradition, studies have focused on identifying the factors the may moderate the impact of participation towards the success of ICT4D project. Studies that adopt *transfer and diffusion perspectives* endeavour to show the relevance of theories for other research areas to ICT4D research. For example Bailur (2007b) shows the practicality of stakeholder analysis to determine important stakeholders in ICT4D project. Analysis of the actors that are participating in the implementation of ICT4D project is critical to determine the influence they might have on the success or failure of the project. Others utilise the theoretical concepts from development study and IS literature in order to determine ways to realise potential of user participation in development ICT4D on the success of implementation of ICT4D project. Issues such as degree of participation, the capabilities of the target users, the role of governmental and community institutions has been posited to moderate the impact of participation towards the success of ICT4D project (Puri & Sahay, 2007).

The role of governmental and community institutions has also been emphasised by studies who adopted social embeddedness discourse. Such studies have adopted inductive approach in theory building by utilising various social theories in order to interpret phenomenon of participation in each of their local context. For example, Puri and Sahay (2003b) make use of Habermas's ideal speech to show important role of local community institution called *Gram Sabhas* to facilitate participation in the development of Geographical Information Systems in India. Similarly, Kanungo (2004) shows the role of women group during implementation of telecentre project in India. Others for example Van Belle (2005) use Actor-Network Theory to show the important role of project manager as individual that can encourage participation from target community in the telecentre project in South Africa. Bailur (2007a) points out the issue with user capabilities to participate including skills, resources, and time in the study using grounded theory of ICT4D project in India.

Within the studies that inspired by HCI research, Participatory Design studies that adopt *transfer and diffusion discourse* tries to developing best-practice for participatory process in ICT4D context. It utilizes the well-established participatory systems development methodologies (Muller, et al., 1997; Schuler & Namioka, 1993) and adapted to the context of ICT4D by considering contextual factors such as "particular personal and organizational factors, ethnic culture, administrative culture, social factors e.g. political history, economic factors, e.g. poverty vs affluence; geography and climate" (Korpela, Soriyan, Olufokunbi, & Mursu, 2000, p. 138). In contrast, those studies that adopts *social embeddedness discourse* focuses on developing conceptual analytical capacity to guide-context specific sense-making and practices of specific countries for the participatory process including i.e. standard that sensitivity to political environment (Braa, et al., 2007; Braa & Hedberg, 2002; Braa, et al., 2004), ethical consideration (Byrne & Alexander, 2006) and culture (Miscione, 2007).

SUMMARY AND DISCUSSION

To sum up, there has been on-going debate on the link between user participation and the success of ICT4D project. Several studies have pointed out their promising link (Colle, 2005; Roman & Colle, 2002; Whyte, 2000), but recently others have argued such simplistic assumption and warned that the causal link might be more complex than assumed (Bailur, 2008; Heeks, 1999;

Ramirez, 2008). This review has shown that indeed the link between the participation-success construct is indeed considerably more complicated than the direct relationship traditionally assumed. However, there are still many issues that need to be addressed and further suggestion can be made, include:

IS research

The IS research acknowledge the issue and offers "what" needs to be made in light of changing technological and managerial conditions. It captures the institutional and development-related contexts that shape and influence the processes of user participation and the management of change. Studies that follow IS research tradition have argued that the positive impact of user participation on the success of ICT4D project are moderated by the contextual factors surrounding the context of system development. This argument is actually inline with general IS studies (see for example, (Cavaye, 1995)). Furthermore, studies within transfer discourse have adopted several instutional factors from other research areas and tested it in the context of ICT4D project. In addition, studies within social embeddedness discourse have enriched our knowledge regarding specific contextual factors in different countries. Several suggestions can be made to

First, further study may further investigate and expand the existing factors that moderate relationship between user participation and success of ICT4D project by adopting other theoretical framework from general IS studies. For example, the contingency theory that has offered various conditional factors that moderate the impact of participation on the success of information systems development (Ives & Olson, 1984; McKeen, Guimaraes, & Wetherbe, 1994; Tait & Vessey, 1988). This framework can be adopted and tested in the context of development of ICT4D project. There are some technical factors such as technology availability and degree of task complexity that may also be applicable in the context of development of ICT4D project.

Second, Studies with social embededdness offers local perspective to the theoretical framework regarding these contextual factors. Such studies can be used to further clarified the best practice framework in the specific context. So far, many of these studies were conducted in ICT4D project in India and Africa. Further studies in other countries would definitely enhance our understanding of the conditional factors by offering differences or similarities between different contexts.

Third, the modelling of the link between participation-moderating factors-success should be further investigate and refined in order to avoid confusion about the benefits of participation. As explained in the beginning of this paper, participation construct has different attributes, including degree, type, extent, and content. Similarly, success construct has also different measures. Inconsistent operationalization of measurements used for user participation and system success may attribute to the mixed findings.

One of the starting points is to further refine and categorised the conditional factors based on the attributes of participation employed in ICT4D project. For example, the degree of participation. Different ICT4D project employs different degree of participation (informing, consultation, joint-action). Doll and Torkzadeh (1989) posited that in order to have positive impact, the degree of user participation should be roughly corresponds to the conditional factors surrounding the context of system development. Such condition is called *equilibrium or moderate deprivation* (Doll and Torkzadeh 1989, p. 1160). They found that under such condition, the participation, whether low or high, has positive effects on all three physiological measures (i.e. value attainment, cognitive, and motivational). As predicted, outside this condition the user participation is having negative or no impact on the success of ISD. This finding actually mirrors that of Locke and Schweiger (1979).

Most development of ICT4D projects assumes that higher degree of participation is desirable for the success of ICT4D project. However, this is not necessarily so, and it may have a detrimental effect (Bailur, 2008; Heeks, 1999). Doll and Torkadez' hypothesis was also backed up by King and Lee (1991), who conclude that the higher degree of participation in IS development may well contribute less towards satisfaction than ensuring that conditional factors such as such user willingness to participate are present.

This view means that the success of development of ICT4D project can be achieved by employing any degree of participation as long as the conditional factors that facilitate each degree exist. Harris and Weistroffer (2009) used the term *optimal level of participation* to describe such condition. Their review of major studies from the year 1996 to 2009, that investigated the relationship between user participation and system success conclude that participation that pass optimal level of participation does not add any value and rather may be perceived as waste of resources. Further studies in ICT4D research can make use of above

findings and further enhance our understanding regarding the conditional factors that moderate the participation-success link.

HCI research

At the same time, the HCI research also acknowledges the same issue and but instead offers "how" (or better ways) to conduct participation process. It seeks to explain where and how user participation should occur and find strategies based on the results for the most appropriate involvement for users during system development.

Doll and Torkadezh's (1989) argument obviously challenges the other point of view that stems from the Participatory Design (PD) research, where it argues that higher level of user participation is critical for user participation not only to encourage democratic principles into workplace but also enhances psychological buy in towards the system (Muller, et al., 1997; Mumford, 1983; Schuler & Namioka, 1993). Most of the participatory design methodology proposed in ICT4D literature covers higher degree of participation. Hence, further studies might also proposed methodology for different degree of participation.

In relation with attributes of participation, Literature in PD research also gives hint regarding possible research areas. For example, it is also possible to develop different methodology for different stages of project development (see for example (Muller, et al., 1997). Studies within transfer discourse can adopt these methodologies into the context of ICT4D project. At the same time, studies within social embeddedness discourse can enrich these understanding by bringing specific issues that need to be consider when implementing particular participatory method within a particular local context.

In conclusion, since the report published by InfoDev (2003) which call for participation from target users in the development of ICT4D project, the are still many unanswered questions with regards to positive impact of participation on the success of ICT4D project. The importance of user participation will continue to grow as various ICT4D projects continue to be established. Therefore, How to improve system success via effective user participation will remain central to ICT4D research.

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