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# A Critical Review of the Role of User Participation in IS Success

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**ABSTRACT**

Despite the widely held view that systems are more likely to be successful if users contribute during systems design and development, the exact nature of the relationship between user participation and system outcomes remains unclear. By conducting a systematic review of the related literature, we synthesized the findings of 46 empirical studies, explained the mixed results, and identified issues for future research.

**Keywords**

User participation, system development, system success.

## 1. INTRODUCTION

The changing trend in the use of the World Wide Web has led to the development and evolution of online communities where users generate and distribute content (Preece, 2001). Specifically, the emergence of the Web 2.0 technologies has led to the development of social network sites geared towards user participation rather than technology. It is also increasingly evident that the information systems development context is changing and its dependence on user participation showing a dramatic increase in the form of Open Source Software development (Tsang, 1999). The OSS model has defied traditional software development practices by following unconventional principles such as the distribution of free source code and massive user participation. In addition, more organizations practice the inclusion of users' during software development process. Hence, these emergent trends, along with the most often observed organizational practices of including users in system development gives credence to putting more effort into understanding user participation and its effect on system success.

While the relationship between participation and traditional information systems development has been explored and studied extensively, findings from these studies are inconsistent. By conducting a systematic review of the related literature, we synthesized the findings of 46 empirical studies and provided suggestions for future research. The remainder of the article is organized as follows: after an introduction of the methods used for article selection and the conceptualization of user participation and system success, research findings are discussed in detail. The paper ends with suggestions for future researches.

## 2. METHODS FOR ARTICLE SELECTION

The research articles on user participation were selected from the following databases: ACM Digital Library, Business Source Premier, Compendex, INSPEC, MathSciNet, National Technical Information and Web of Knowledge.

The search generated a total of 69 articles and among these, 46 were chosen based on their relevance. The research articles were published between 1977 and 2008; mostly after 2000 (see Figure 1 and Appendix A).

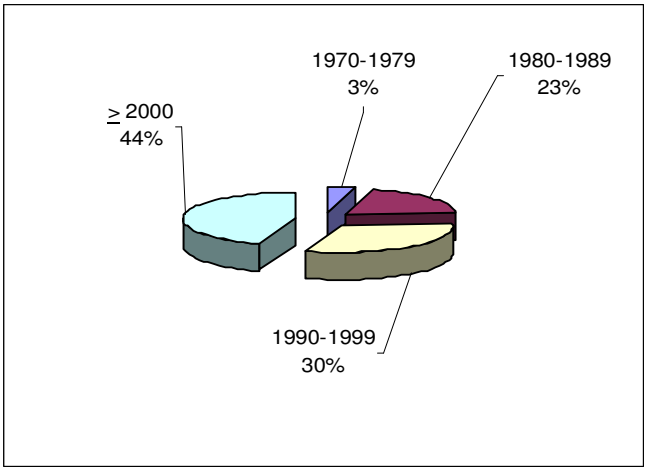


**Figure 1. Publication year distribution of reviewed articles**

## 3. THE CONCEPTUALIZATIONS OF USER PARTICIPATION, SYSTEM SUCCESS AND THEIR MEASUREMENT CONSTRUCTS

### 3.1 User participation

#### *3.1.1 Definitions and Related Concepts*

While this research work will focus on user participation and its relation to system success, it has proven prudent to define other related terms including user involvement and engagement.

Barki and Hartwick (1991) suggest using *user participation* when "referring to the various design related behaviors and activities that the target users or their representatives perform during the system development process" and *user involvement* when referring to a "subjective psychological state of the individual". An additional term coined by Kappelman and McLean (1991) is *user engagement*, and it includes both participation (the behavior) and involvement (the attitude) and refers to the total set of user relationships towards IS and its development.

#### *3.1.2 Measurement Constructs*

Some of the most commonly used dimensions of user participation as defined by Cavaye (1995) are listed in Table 1.

| Attributes | Possible Values |
|---|---|
| Type | All users, representatives of users |
| Degree | Advisory capacity, sign-off responsibility, part or team, full responsibility |
| Content | Technical design, social and technical design |
| Extent | Project, requirements definition, building, testing |
| Formality | Formal, informal |
| Influence | Input ignored, contribution considered, input taken seriously |

**Table 1. User Participation Attributes (Cavaye, 1995)**

These participation attributes recognize that user participation is not a definite, harmonized concept and in reality, may take many forms and can occur at many levels.

Figure 2 presents the distribution of participation attributes identified during the review process. 57% of the reviewed articles measured participation in terms of users' activities and a single study used formality measures. Type and content measurements were not shown in` these studies. In other words, sample representation, respondents' contribution and the environment in which participation took place were not accounted for. Representing these factors could be especially difficult if the research work was done after system implementation, which holds true for 87.5% of the reviewed articles.

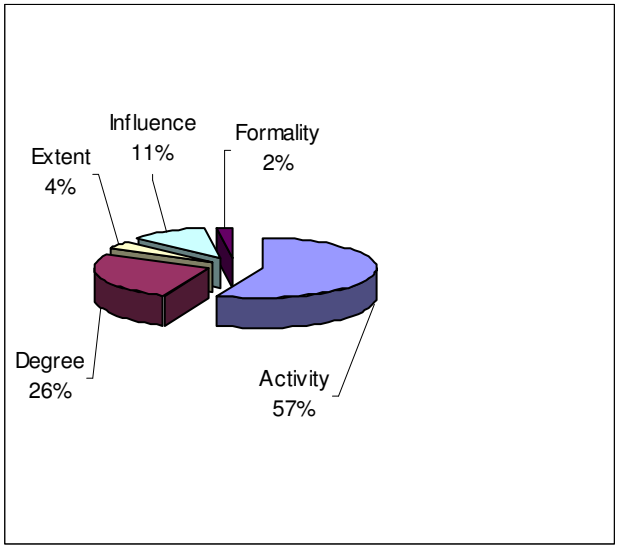


**Figure 2. Opertionalizations of user participation**

### 3.2 System Success

#### *3.2.1 Conceptualizations*

In an ideal world, explaining information system success in terms of realized economic terms would be the most uncomplicated measurement of success. However, economic justification and evaluation is difficult especially since benefits of IS are hard to identify. As a result, the IS community relies on surrogates (McKeen and Guimaraes, 1997).

#### *3.2.2 Measures*

DeLone and McLean (1992) developed a model that classifies success measures into six dimensions – system use, user satisfaction, system quality, information quality, individual and organizational impact.

Similar to the participation construct, most researchers used a single measure, user satisfaction as shown in Fig. 3.

## 4. THE IMPACTS OF USER PARTICIPATION ON SYSTEM SUCCESS

User participation is expected to have positive impacts on system success. This view is confirmed empirically from the following aspects:

- User satisfaction and acceptance (McKeen and Guimaraes, 1997)
- Accurate picture of user requirement (Rees, 1993)
- Facilitated communication and conflict resolution (McGill and Klobas, 2008)
- Increased system quality (Medina and Caparro, 2007)
- Individual and organizational impact (Standing and Terry, 2004)
- Decreased implementation time (Jiang, Klein and Chen, 2006)

Despite the above widely held view, the relationship between user participation and system success was not consistency supported and even found to be negative at times. For example, it can lead to a group dysfunctions (Kim and Peterson, 2003) and increased project costs (He and King, 2008).

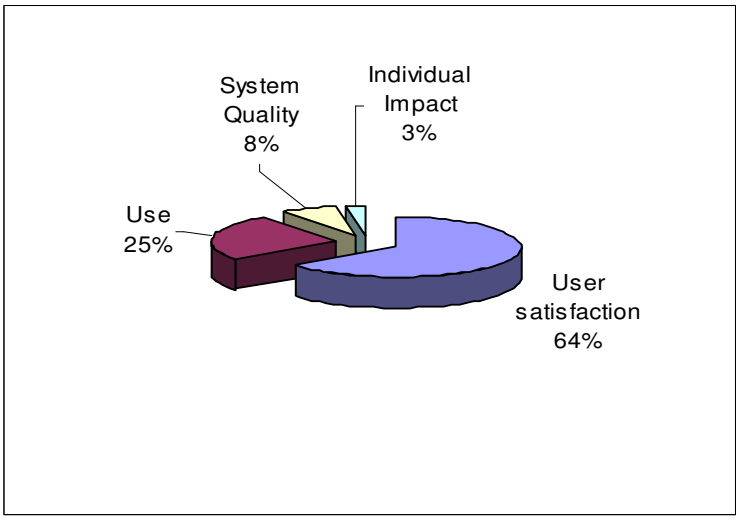


**Figure 3. Opertionalization of system success**

## 5. ALTERNATIVE VIEWS ON THE RELATIONSHIP

Empirical findings on individual factors associated with participation and their link to success have been mixed (Wagner and Gooding, 1987). One major reason is that the participation-success relationship is more complicated than was traditionally assumed.

After a careful review of the literature, we have identified alternate views that question a direct link between participation and success and instead provide new perspectives by encouraging the identification of various contextual factors that may govern and ultimately decide the outcome of the relationship.

Bostrom and Heinen (1977) identified three system and behavioral issues that need to be addressed during the introduction of an information system: - 1) human or behavioral problems, 2) causes for these behavioral problems and, 3) how to overcome them. Researchers have spent a great deal of effort on the #1, with some futile attempts on #2. However, the concern seems to have switched to #3 without a complete understanding of #2. Consequently, this has resulted in the development of techniques that appear to solve some of these behavioral problems.

Concentrating on the interplay between three groups during the IS development including Developers, Business managers, and End-users, Fakun, Richard & Greenough (2003) concluded that contextual conflict in the participatory design needs to be understood and resolved before participation can contribute towards a successful system.

A finding by Nandhakuman (1997) proposes that participation research should take a different angle from the traditional research which is aimed at formulating a set of generalized guidelines for improving user participation. Instead, contextual factors affecting developers' resourcefulness in traversing physical, social and individual constraints and their ability for improvisation needs to be considered. Another view presented by Gefen, Ragowsky and Ridings (2008) states that we can achieve system success without users' actual participation, but through what is known as "passive participation", which essentially involves the manipulation of different contextual variables.

The constructs involved in the participation and success relationship has been challenged. For example, participation was found to have more influence on attitudinal/behavioral outcomes rather than system outcomes (He and King, 2008). Also, participation in itself was found to be unrelated to system success (Kappelman and McLean, 1991). Instead, the combination of user participation and involvement, named user engagement, was found to be more important in understanding information system success. This behavioral-attitudinal theory (participation + involvement) was found to be superior to the behavioral theory (participation) and closely related to system success. It has also been suggested that user participation should not be evaluated against IS success, but against system features (Fakun and Greenough, 2004). In addition, perceived usefulness, not

user participation was found to have a major influence on behavioral intention to use, and as such, "developers should concentrate on features that increase the user's job performance" (Fakun and Greenough, 2004).

In summary, alternate views that were identified in existing literature question the existence of a direct link between user participation and success, and instead focus on identifying contextual variables that could have a decisive power in the outcome of the relationship.

### 5.1 Alternates with contingencies

One of the many possible reasons for the ambiguity and contradiction in the findings of the participation-success construct is the omission of important factors surrounding the development of information system, also known as the contingency approach (McKeen and Guimaraes, 1997). The contingency approach has been widely utilized in identifying factors that may alter the consequence of the participation-success process.

In order to make a meaningful contribution to the effect of participation on system success, contingent variables need to be identified and categorized (Jamshidian and Rahnama, 2004). Therefore, we grouped contingent variables identified from the extant literature into three categories: Technical, Managerial and User behavioral attributes (see Table 2). These groupings were found to be appropriate since the three main characters during the participation-system development process are the organizational management groups, technical team and the user participants. Technical attributes were perceived to be concerned with the technical aspect of the system and variables that would directly affect the system's outcome including system and task complexity, development methodology and project management strength. Managerial attributes are focused on the organizational management bodies and their decision variables including management style and backing, resource constraints, system impact and developmental stages participants contribute to. User behavioral attributes focus on participants' attitudes and the way they perceive the system. These variables include perceived usefulness, ease of use and meaningfulness of the system along with user attitude. Grouping this variable in such a coherent manner is expected to make their identification easier and meaningful.

| Contingencies | Articles | Grouping Attributes |
|---|---|---|
| Development methodologies | [29] | Technical |
| Project management strength | [19] | |
| Task/System complexities | [3], [17], [22], [29], [42] | |
| Development stages | [22] | Managerial |
| Management backing | [19] | |
| Management style | [23] | |
| Resource constraints | [17] | |
| System impact | [17], [29] | |
| Task meaningfulness | [8] | User |
| Perceived usefulness | [28] | |
| Perceived ease of use | [28] | |
| User attitudes | [17] | |

**Table 2. Contingency Groups and Variables**

Among the three groups of variables, managerial contingent attributes were identified most frequently to have an effect on the participation-success. A study by Tait and Vessey (1988) was able to identify a representative variable from all three groups. Whenever possible, contingent variables that focus on organizational management, user behaviors and the technical attributes should be identified and included in order to understand their overall effect on outcome of participation.

### 5.2 Alternates with Mediators

Mediators were identified as variables that intervene between the participation-success construct. Lists of mediators identified during the review are presented in Table 3.

| Mediators | Articles | Grouping Attributes |
|---|---|---|
| Information quality | [44] | Technical |
| IS effectiveness | [36] | |
| MIS growth stages | [3] | |
| System quality | [3], [39], [44] | |
| System type | [27] | |
| Development stages | [27] | Managerial |
| Participant influence | [13] | User |
| Participation frequency | [13] | |
| Participant understanding | [3] | |
| User acceptance | [3] | |
| Ease of use | [33] | |
| User training | [36] | |
| Perceived usefulness | [33] | |
| Perception of use | [33] | |
| Perceived participation | [39] | |
| Perceived ownership | [39] | |
| Intention to use | [39] | |

**Table 3. Mediating Groups and Variables**

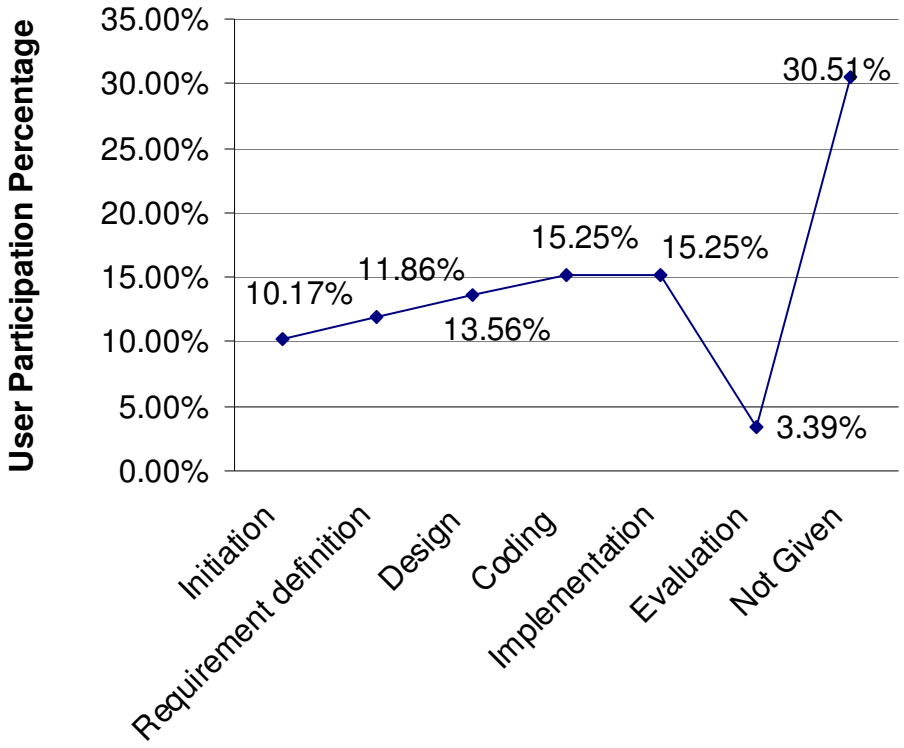


**Figure 4. IS developmental stages that involve user participation**

Similar to the contingent variables, mediators were also classified as technical, managerial and user behavioral attributes and accordingly the same definitions given earlier in section 5.1 were found to be applicable. Among the three groups of variables, user related moderators were studied most frequently and managerial attributes were the least mentioned.

Participants could contribute to different ISD stages and the timing and focus of participation is critical and has been found to be most beneficial at the following phases: - 1) Post implementation (Wagner and Newell, 2007), 2) Early stages of development (Schaik, 1999) and, 3) Analysis and design stages (Wu and Marakas, 2006). Within the revised articles, as shown in Figure 4(above), 30% did not reveal the specific ISD stages of user participation, and this could make the replication and application of these findings to real world system development scenarios difficult.

## 6. SUMMARIES AND SUGGESTIONS FOR FUTURE RESEARCH

The premise that user participation is vital to ISD has motivated many studies. The participation-success relationship has evolved over time. Most research works have identified the participation-success construct to be considerably more complicated than the direct bivariate relationship traditionally assumed, and a number of these variables have been identified. However, there are still many issues that need to be addressed.

- Inconsistent operationalization of measurements used for user participation and system success may attribute to the mixed findings. In an attempt to make the identification and grouping of participant attributes easier, dimensions given in Table 1 can be further defined according to their specific focus on participants' representation, responsibility, contribution, scope, environment and influence: representation focuses on the proportion of users' ranging from inclusion of all possible users to limited representative users, responsibility acknowledges that users may have different levels of responsibility, contribution considers the possibility that users may contribute towards different aspects of the system development process, scope is based on the assumption that participants input could be diverse and have different level of degrees, environment focuses on the nature of interaction between participants and designers and finally, influence focuses on whether participants input was taken seriously or not. Taking account of these participation attributes will make the interpretation of future findings easier and consistent. Both participation and success should be considered as interdependent dimensions rather than independent ones. These are multidimensional constructs and should be measured as such.
- There is a need to clarify related constructs and, particularly, to build validated research instruments. Only then can studies be replicated and a cumulative body of findings produced. Current metrics makes certain assumption about the user participation-success construct. For example, one of these assumptions is that participants will have a static role during the system development process and there is no means of accounting for changes in the participant's representation, responsibility, contribution, scope, environment and influence over the development process.
- There needs to be a clear distinction between user participation, involvement and engagement mostly since these seem to be used interchangeably. From the 46 research works reviewed, 61% did not make a distinction between these terms and the psychological, behavioral or combination of the two seems to be used indiscriminately. Also, we were not able to identify a valid measurement for involvement, although most researchers used the participation metrics for measuring involvement. Another important information that was scarce was the specific system developmental stage that users were involved in. In this case, even though the research works that didn't identify participation stages were still considerable (30.51%), more information was available on these in comparison to system type and developmental methodologies. The lack of information in these variables means that the research works can't be generalized or expanded upon.
- The presence of constraints in the participation-success construct has been largely overlooked. These variables will ultimately affect the human action and interaction. The only work that addressed these variables, albeit in a very constricted way, was that of Nandhakumar and Jones (1997) and it focused on the constraints between executive users and developers. Some of the constraints include physical constraints referring to limits arising from the physical constitution of individuals, social constraints originating in socially established conditions and place limits upon the range of options open to an actor in a given circumstance and individual constraints arising from the individual's sense of identity and personality, biographical experience, social skills, and perception of the social world. These constraints will not necessarily have a detrimental effect and could actually be considered as opportunities for enablement (Nandhakumar and Jones, 1997). However, they need to be incorporated into studies involved in understanding the effect of participation on system outcomes. In situations where constraints are deemed as disadvantageous, we need to understand how to identify, overcome and even transform them to our advantage.
- Studies of user participation have assumed a traditional data processing environment where users interact with computer resources indirectly, and ISD follows the routine stages of system development life cycle. However, with the advent of web 2.0, the role of the participant has evolved to where users generate and distribute content. This

calls for research that looks into how participation will affect system development and success in these evolving environments.

- Open Source Software (OSS) has not only attracted the interest of developers but is also becoming popular among less technical users. The popularity of OSS can be seen in the increasing variety of applications such as MYSQL, and LINUX, and in the recent trends of IT corporations to open parts of their code libraries. While there are many successful examples of high profile OSS, many projects that share a platform (e.g., Sourceforge) stop being active one year after their launch and over 80% of all projects remain inactive ( Stewart and Gosain, 2006). Such a failure may be due to their inability to get knowledge contributions which is a limited resource for OSS projects because of their dependence on voluntary contributions of users. Hence the participation constructs and its relation to OSS development needs to be explored.
- The confusion about the benefits of participation, we believe, has arisen largely due to the simplistic manner in modeling the participation-success relationship. Alternative views that take contextual variables into consideration, as discussed in section 5, should be further investigated and expanded upon.
- The participation-success relationship should be examined with regard to system type such as Decision Support Systems, E-Commerce, Collaborative and non-collaborative systems, and system development methodologies such as Traditional development method, OSS, and RAD. Also User participation can be characterized from multiple dimensions, including formal/informal, direct/indirect, active/ passive, alone/with others, and overall /at specific stages of the development process. These systems and dichotomies differ in the kind of information they require from users, the kind of participation they could accommodate and formality requirements and so on, and need to be studied within their contexts.
- The use of contingencies and mediators, although effective in clarifying the participation-success theory under certain conditions, has also been found to be fragmented in the literature. Also, in order to make meaningful contributions on this subject, both contingent and mediating variables need to be categorized in a meaningful manner. The grouping provided in section 5.2 and 5.3 could serve as a starting point for identifying these variables. Also, among the three groups of variables identified, managerial attributes were identified by more researchers to have an effect on the participation-success construct. Future work may identify more management attributes and other types of variables. More importantly, further research should be done in refining the grouping, since some of these attributes could have overlapping behaviors.
- The opportunity for users to participate in the design and development processes has expanded in recent years through such communication and information technologies as mailing lists, bug trackers, usage monitoring, rich interactions between users and service-center staff, remote usability testing, and so on. We need to understand how these information and communication technology can be integrated into system design and development processes to improve user participation.

The importance of user participation will continue to grow as the distributed web-based platform becomes widely adopted for system development. How to improve system success via effective user participation will remain central to information system development and user participation research.

Appendix A. Reviewed Articles

| Articles | Journals/ Conference Proceedings Name(*) |
|---|---|
| Bostrom(1977) | 16 |
| Alter (1978) | 16 |
| Robey(1982) | 15 |
| Ives(1984) | 15 |
| Kim(1985) | 2 |
| Hirschheim(1985) | 16 |
| Baroudi(1986) | 6 |
| Wagner(1987) | 1 |
| Baronas(1988) | 16 |
| Tait(1988) | 16 |
| Doll (1989) | 15 |
| Barki (1991) | 8 |
| Kappelman (1991) | 8 |
| Rees(1993) | 10 |
| Leitheiser (1994) | 13 |
| Cavaye(1995) | 11 |
| Saleem(1996) | 16 |
| McKeen (1997) | 16 |
| Lu (1997) | 11 |
| Hunton (1997) | 15, 16 |
| Nandhakuman (1997) | 8 |
| Butler (1997) | 8 |
| Choe(1998) | 11 |
| Hwanga (1999) | 11 |
| Schaik(1999) | 5 |
| Lin (2000) | 11 |
| Aladwani (2000) | 19 |
| Doll (2001) | 12 |
| Fakun (2003) | 18 |
| Howcroft (2003) | 17 |
| Standing (2004) | 14 |
| Lynch (2004) | 9 |
| Rondeau (2006) | 11 |
| Jiang (2006) | 3 |
| Sabherwal (2006) | 15 |
| Wu (2006) | 7 |
| Wagner (2007) | 3 |
| Wagner (2007) | 6 |
| Kwum (2007) | 6 |
| McLeod (2007) | 4 |
| Medina (2007) | 7 |
| Mattia (2008) | 8 |
| He (2008) | 16 |
| McGill (2008) | 5 |
| Gefen (2008) | 11 |

Journals/ Conference Proceedings Name (*)

1. Academy of Management Journal
2. Asia Pacific Journal of Management
3. Association for Information Systems
4. Australasian Journal of Information Systems
5. Behavior and Information Technology
6. Communication of the ACM
7. Computer Information System
8. Conference Proceedings
9. European Journal of Information Systems
10. Industrial Management & Data Systems
11. Information and Management
12. Information Resources Management
13. Information Technology Management
14. Informing Science
15. Management Science
16. MIS Quarterly
17. New Technology, Work and Employment
18. Requirements Engineering
19. SIGMIS Database

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