

Responsibility in User Participation in Information Systems Development

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ABSTRACT

Information systems (IS) are social in nature; they structure and use information technology within an organisation to fulfil its needs. If we are to fully understand IS development in an organisational context, those needs must come in great part from the users of the system. However, this is something that is not properly addressed by current IS research and practice. This article shows some of the reasons and consequences of this neglect. It also points at responsibilities that different actors (managers, users, developers, researchers) have on this issue.

1. INTRODUCTION

Information systems (IS) are social, rather than technical systems (Hirschheim, 1992). One of the crucial components of this social structure is the user of the IS. In principle, everybody agrees that information systems should not be developed and designed without an intense communication process with the user. Mumford has been one to acknowledge this, by saying that “people at any level in a company, if given the opportunity and some help, can successfully play a major role in designing their own work systems.” (Mumford, 2001, p. 56); sentiment echoed by Omland (1999) and Schultze (2001). Kettinger and Lee (2002) also argue that if users and the IS function in a company agree on the need and characteristics of a new information technology (IT) project before its adoption, it is likely that the satisfaction of the users will be higher.

Before continuing, it is important to clarify what is understood by information systems and why they are considered to be of social nature. Checkland and Holwell (1998) describe IS broadly as the organizational need to manage IT in relation to an organisation’s activities and intentions, and characterize it as a hybrid discipline, which draws from exact science, technology and social science. Land describes an information system as “a social system, which has embedded in it information technology” (Land, 1992, p. 12). IT, by the way, is defined as a collection of practices, techniques and devices concerned with collecting, storing, processing and distributing data or information (Checkland and Holwell, 1998). Thus, any inquiry regarding IS requires a grasp of both the structured and structuring influence of social action, particularly in those scenarios where technology, information and social action are inextricably intertwined (Schultze, 2001). In other words, as de Moor (2002) points out, the social and technical systems in an organization co-evolve by changing each other; methods to deal with this should focus on the interpretation of this complexity rather than its representation, preventing the generation of new specifications which do not involve the community (and are thus artificial, obsolete and alien to the group). Furthermore (*ibid.*), many specification methods assume that the initiating, coordinating and integrating roles are played by external analysts and designers, while users are assumed to have only tacit knowledge and insight.

The next section presents some background of the treatment of user participation in existing literature. Section three discusses some of the reasons why user participation is neglected in IS development, followed by some of the negative consequences of this neglect. Section four presents a list of the main actors of IS development (from the researchers to the managers) and what their responsibility or role is or might be in improving user participation. Section five presents some final remarks and suggestions.

2. BACKGROUND

User participation in IS development is by no means a new or ignored subject. At least since the early 70s it has been addressed as cooperative design, partici-

patory design, user-centered design and even end-user development. Some of the initial input was provided by Scandinavian trade union cases (Kyng, 1991) and the topic has been present in several issues of the Communications of the ACM. The use context has not been ignored (Karat, 1997), among other things because it has been recognized that doing so ends up being more difficult in the end (Brown & Duguid, 1994).

Accordingly, users have been proposed as co-designers (Fischer *et al.*, 2004; Kyng, 1991). A general argument is that all work is social and cooperative in nature (*ibid.*), which translates to the information systems domain (Brown & Duguid, 1994). Kyng (1991) sees cooperative design as a mutual learning experience with limitations because neither the user nor the designer will enter fully into each other’s role. Another limitation is that in spite of cooperation, design decisions still draw lines and some users may feel that features have been left out (Brown & Duguid, 1994). One strand of cooperative design is participatory design (Kyng, 1991), justified by early arguments for user involvement, such as: combining sources of experience, creating ownership and experience, and enabling participation in decision-making by those affected. However, despite there not being any serious critique against it, participatory design has been slowly or partially implemented (*ibid.*; Karat, 1997; Mao *et al.*, 2005).

Another approach is that of user-centered design, or UCD (Karat, 1997; Mao *et al.*, 2005). According to a recent survey (*ibid.*), UCD improves usefulness and usability. Indeed, stemming from this approach, the ANSI/HFES 200, ISO 9241, and ISO 13407 standards for usability were developed, including design principles and evaluation measures (*ibid.*; Karat, 1997). Some of these practices focus on user analysis, which are highly context sensitive and difficult to generalize and to be agreed upon (Dillon & Watson, 1996). Other difficulties of UCD are: complexity, cost-benefit relationship, and lack of formal methods (Mao *et al.*, 2005). UCD also risks focusing too much on internal user requirements at the expense of external, equally important ones (Brown & Duguid, 1994). A problem that remains for UCD and other participatory approaches is that they tend to be only partially applied, usually at the initial phases of IS development, and not in a rigorous end-to-end manner (Mao *et al.*, 2005; Fischer *et al.*, 2004).

An increasing trend, both more radical and risky than the previous approaches, is end-user development (EUD). At first, this may be seen as a consequence of inadequate user participation in the past, prompting users and user communities to “upgrade” their role to that of developers, aided by easier tools and access to knowledge. However, seriously treated, EUD is a viable socio-technical approach, which according to the principles of meta-design (*ibid.*) empowers users to become not just participants or co-designers, but designers in control of the continuous development of the systems they use, in a style similar to some successful open source developments (*ibid.*). For EUD to consolidate itself as a successful IS development approach, it is necessary that user motivation, effective tools, and management support create an effective balance (*ibid.*). The challenges presented in this section, prompt us to continue treating the subject.

3. NEGLECTING USERS: REASONS AND CONSEQUENCES

Some authors (Mumford, 2001; Collins *et al.*, 1994; Armour, 2002) consider user involvement in IS development an ethical issue. Whatever the reasons may be for ignoring users or just calling on them partially or with false intentions, the fact is that introducing a new IS will alter the way people go about their jobs or communicate amongst each another. Ignoring this is a lack of vision that may

decrease the quality of work life. This is coupled with the fact that the success of the IS may be compromised and failures may result in economic or even human loss. We will present an incomplete, yet relevant, set of reasons and consequences for not involving users adequately in IS development.

3.1. Possible Reasons for Neglecting Users

A reason for neglecting user participation stems from the belief that this is a *soft issue*, which pertains to other actors or disciplines. It is not uncommon to hear IS practitioners disregarding the user participation issue as one that is related with human aspects that don't concern them. This is not to say that they are unaware of its impact, they just believe it is someone else's responsibility to care for this. The hard-core technicians consider these social details as something that they shouldn't be bothered with. Besides, they might argue that it is not scientifically possible to deal with human issues: "for something to be considered scientific it must use the agreed set of conventions – the scientific method" (Hirschheim, 1992, p. 30), and since the scientific method does not offer an adequate way to handle user participation, it is regarded as an unscientific or soft issue.

A second, not often recognized, reason for not including users is an intent to *strengthen or enforce power relations*, especially within a hierarchical organization. Information technology, by changing the communication medium, may alter in a positive or negative way the meaning of a message. There is a discourse built in the system, which determines hidden meaning, and may be in fact reinforcing power structures. There might be a direct conscious manipulation of an IS to maintain power relations, as shown in (Olesen and Myers, 1999), who describe how top level assistants modified a Lotus Notes implementation, so that other employees wouldn't have access to managers' agendas and in doing so maintained their control over them. There are also more subtle ways to enforce power through IS, such as the one mentioned by Ceez-Kecmanovic (2001), in which a University President apparently calls for employee involvement in a restructuring, through the use of computer-mediated communication, but in reality takes covert strategic action by ignoring the criticism posted on the system and going ahead with his initial ideas, without the staff being able to argue that they didn't have a say in it.

Another common reason for user participation to be ignored or brought to a minimum is the desire to *build fast and cheap* systems. This is an increasingly strong objective, in part because of the dynamics of IT, which may make a long-lasting development an already obsolete product when it comes out. At least that is the assumption, and it is one which sees IT as a technical device in isolation. The downside to this is that usually, on the long run, this may not be the case and, in fact, a simplified design can produce a system that doesn't work as desired. One should keep in mind that "managing complexity requires flexibility and diversity while profit generation requires efficiency and control. These two sets of needs are difficult to combine." (Mumford, 2001, p. 49)

Now that some of the reasons for not appropriately involving users have been put forward, it seems attuned to examine some of the consequences.

3.2. Consequences of Neglecting Users

The first direct consequence of neglecting users in IS development is potential *failure of the system*. All new software can be assumed to contain errors, even after millions of executions (Collins *et al.*, 1994) and not all of them can be blamed on not involving users. The Hubble's faulty mirror, the AT&T shutdown of long-distance for hours in 1990, the USS Vincennes unreliable radar system (which ended up in shooting down an Iranian commercial flight), the Therac-25 radiation therapy machine killing people with x-ray overdoses, are all notorious examples of IT failure (*ibid.*). One can't help but wonder if user input would have avoided any of these failures. Usually the managers have an idea of what they would like to see in the new system, the developers understand this in a particular way, which may or may not be compatible, and then the users accommodate it to their daily work. Of course, a fool-proof, well documented system may be taught and put to use according to plans, but it has already been underlined that IS are coupled with organizational issues that cannot be handled by the system intrinsically, such as politics and culture. The management of this aspect necessarily must involve all the actors. Failure is not always technical failure.

Another natural negative consequence of not involving users is that they could manifest *resistance towards the system*, Collins *et al.* (1994) discusses a hospital case in which medical staff distrusts a new automated pharmaceutical process and the solution is to put it out of production. Mitev (2000) notes that, regarding

IS, some actors go along with the will of others, while some resist. Resistance is in fact a common feature of any social system. Another example: a few years ago, one of the authors was involved with the help desk of a relatively large IT provider in Colombia where they managed service calls with the aid of an in-house developed database system. It was a simple, single-user database, which technicians and managers used to register and follow-up the calls. The company had recently been absorbed by a bigger one (not related to IT) and part of this deal meant switching to one particular large helpdesk software. Nobody argued that the new system would be full of best-practice features; nonetheless, during the process of adapting the tool, not once were the technicians involved; they were simply trained on using the software and forced to use it in parallel with the old tool for a complete switchover a few weeks after. There were a lot of details that the technicians were accustomed to filling in a certain way and the new tool proved to be rather tedious for this purpose, resulting in the users not including this information in the new tool and simply relying on the old one for their work. This ended up in a growing rejection of the system, which in turn caused further training (cost), a longer adaptation period (time), general dissatisfaction and a decrease in productivity for quite some time.

Strengthening of power structures was already mentioned as a reason for not involving users, but it can also be an undesired or unexpected consequence (from a user's perspective). Mitev (2000) describes the implementation of *Socrate*, a reservation system derived from the popular and successful *Sabre* (for airlines) in the SNCF (French railways). Though this system failed in many aspects, one in particular illustrates the purpose of this paragraph: the adoption of airline-like yield management was implemented to make the railways competitive at a European level. This, however, changed the practices of both railway workers and passengers, conducing to major strikes, criticism and basic chaos. Top executives were convinced that yield management would achieve a techno-commercial solution to the problems in the SNCF and make it cost-effective. However, they did not account for the fact that yield management is hardly just a techno-commercial tool, because it is linked to power relationships, mainly through pricing, that got transferred to staff and passengers, introducing a previously non-existing power structure. Someone could argue that the French are just too eager to strike at any chance they get; regardless of whether this reputation is deserved or not, it certainly means that changes at a technological level should have considered consequences at a political level.

Now that we have seen some reasons and consequences of neglecting users, we argue that someone must take responsibility for involving them effectively, this is the topic of the next section.

4. WHO IS RESPONSIBLE FOR USER PARTICIPATION?

Among the possible actors to take responsibility in user involvement, we can consider those involved in IS development and use, according to Collins *et al.* (1994): provider, buyer, user and penumbra (those affected by system, yet not part of the organisation). They propose a set of responsibilities that these actors have on each other and on themselves, which point to the fact that their interests are different and many times conflict.

Some *managers (buyers)* sometimes take on the responsibility of considering the human aspect of IS development and giving due place to users. Armour (2002), a manager himself, for instance, calls for a "spiritual life of projects" and states that "in our cold, cost-cutting pursuit of efficiency and productivity, we shouldn't forget that software is only made by people" (*ibid.*, p. 14). However, it is likely that managers will answer to their functional responsibility and concentrate on profits. As Jackson (1985) puts it, they wouldn't give up their position of power for an idealized design.

One wouldn't expect *users* to be responsible for involving themselves in the development, but they have increasingly taken on this vacant responsibility, when they feel others don't. Due to delayed IT delivery, poorly prepared requirements and resistance to change – coupled with easier and widely available access to programming languages and the Internet – users have increasingly become confident enough to develop their own solutions without the IS department (Kettinger and Lee, 2002). This has even resulted in user-driven innovation, as opposed to the IS function's traditional role in this (*ibid.*). Users now consider themselves as more experts than what the IS function might expect from them. Enabling the user's recognized expertise and grasp of what the organisation needs, coupled with IS department's know-how might produce better results than any of the two separately.

Another fundamental actor is made up by the *developers (providers)*. Their job is to build an IS which complies with high quality standards, but most importantly, that does what is needed and adds value to the organisation; in order for this to happen, its users are crucial for its success and must be included in the development. On the one hand, there are ethical codes of behaviour that could be interpreted as suggesting user involvement when they recommend acting consistently with public interest (Gotterbarn, *et al.*, 1999). On the other hand, their own professional and group success is tied to the success of the system, so it is short-sighted to only serve a limited set of interests or cut corners.

Lastly, we can include another actor, not necessarily involved with the development or implementation of IS, but crucial in establishing the way in which these two activities are carried out: the *IS researcher*. Being responsible for knowledge production in IS, a researcher's role in user participation is very important. Through publications, conferences, associations and, perhaps more importantly, teaching activities, they influence the way in which developers learn how to build an IS, how managers understand and use IS and, furthermore, how users themselves are seen. In a recent paper, Geoff Walsham (2005) argues that researchers should take on the responsibility of carrying out their inquiries with a critical approach that understands that knowledge is a social construct, that there are historical and cultural contingencies in its production and that power relations influence its development. Furthermore, Walsham suggests that through teaching, publishing and institution building, researchers can influence the way in which IS are understood and used, highlighting the obvious but undermined notion that IT is aimed at improving the lives of people around the world. In other words, IS should contribute towards development (in a broad sense, not a purely economic sense), particularly contributing to reducing the digital divide, questioning the ethnocentrism in existing technology and taking into account gender issues. All three contributions are related to the end-users of IS. A teaching example of this can be found in (Ommand, 1999) that presents an IS development course emphasising the human (user) factor.

5. CONCLUSION

This paper offers an invitation to understanding user participation in information systems development not by looking at the benefits, but rather at the reasons and consequences of partially or totally neglecting users. This negative approach to the user participation issue is meant to raise awareness on the responsibility that different actors have on changing the situation.

We hope that by showing the reasons, consequences and responsible actors we can enhance understanding of the user participation issue with a call on each of these actors to take responsibility. We recognize that by presenting seemingly negative reasons and consequences we have left out what sometimes may be positive aspects of not involving users, such as keeping a project within budget and time constraints, allowing for decision-making not to turn into endless discussion, or innovating without user bias on comfortable tradition. But we do this in order to stress the fact that IS development has a social-nature and approaching it instrumentally (whether it be a technology or management-centred perspective) may be counterproductive for the system itself, which includes all stakeholders.

Participation doesn't start with asking the users about functionality or interfaces; it does not end with questionnaires about usability or friendliness either. It should start by discussing the problem situation with the stakeholders (users in the foreground) without the IS being already the preconceived solution; and it should also be an open-ended learning experience.

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