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# USER PARTICIPATION IN ‘CONFIGURING THE USER’ IN OSS DEVELOPMENT

*Completed Research Paper*

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## **Abstract**

*User participation has been argued to be an integral element of open source software (OSS) development, but it has also been acknowledged that user participation of non-developer users hardly exists. This paper reports findings from an interpretive case study examining non-developer user participation in an OSS project. The analysis relies on the social shaping on technology tradition, viewing OSS as texts, their development as writing and OSS texts as ‘configuring their users’. The analysis reveals that users take part in ‘configuring the user’ in OSS development, but there also is a need for help in organizing user participation in a more systematic way. Nevertheless, in a certain sense OSS development enables active and effective user participation, which could be put for trial also in other information systems contexts. The paper also introduces a refined conceptualization of the ‘user’, of her ‘participation’ and of the relationship between technology design and use.*

**Keywords:** user participation, open source software development, social shaping of technology, interpretive case study

## **Introduction**

This paper reveals how open source software (OSS) development in certain sense enables active and efficient user participation in 'defining the users and setting the parameters for their prospective work practices' (cf. Grint & Woolgar 1995), while being also in a need for help in organizing user participation in a more systematic way. OSS development is a current topic of study in both Information Systems (IS) and Human Computer Interaction (HCI) research (Andreasen et al. 2006; Cetin et al. 2007; Fitzgerald 2006; Niederman et al. 2006; Nichols et al. 2001; Zhao & Deek 2006). The term OSS necessitates that the source code of the software is 'available for anyone who wants to use or modify it', but it is also acknowledged that there are different licensing possibilities and consequently a 'continuum of openness' (Niederman et al 2006: 131).

This paper revisits the old and tired concept of user participation, as suggested by Markus and Mao (2004). New trends in IS development, e.g. OSS development, end user development more generally, product development and web development pose new challenges as well as present new opportunities for user participation. This paper examines these challenges and opportunities in the OSS development context, which is a recent and somewhat controversial setting to examine user participation. OSS development has been praised to utilize a truly 'user-driven' approach (Nichols & Twidale 2006; Zhao & Deek 2006) and user participation has been emphasized as an integral element of OSS development (e.g. Nichols & Twidale 2006; Zhao & Deek 2005). However, it has already been noticed that in OSS development the distinction between user and developer is fuzzy (Zhao & Deek 2005). Traditionally, OSS developers have developed the software to serve their own interests and needs, in which case the developers have been the users of their software and vice versa. However, nowadays the user population of OSS has become larger, including a growing number of users, who are not interested in or even capable of developing the OSS themselves, but they only wish to be able to make use of the resulting solution (Bergquist & Ljungberg 2001; Cetin et al. 2007; Franke & von Hippel 2003; Frishberg et al. 2002; Nichols & Twidale 2006; Niederman et al. 2006; Scacchi 2002; Viorres et al. 2007; Ye & Kishida 2003). This paper particularly focuses on the participation of this kind of users in OSS development.

The paper relies as its theoretical background on the social shaping of technology (SST) tradition, in which it is assumed that technology developers, during development, always inscribe 'predictions about the world' into technological artifacts, the developers being aware of that or not. The developers produce projected, anticipated users with specific competencies, motives, tastes and aspirations, as well as the relationships between the actors in the use setting. On the whole, the developers assume certain kinds of relationships between the technology and its users, and attempt to predetermine the future use setting. However, technological determinism should still not be assumed, but instead it should be assumed that the eventual users are able to react to what is prescribed or proscribed in different ways. (Akrich 1992; Akrich & Latour 1992; Latour 1992.) Within the SST oriented line of research, this paper focuses on the participation of the users in 'configuring of the user' that is assumed to take place during development, 'configuring the user' referring to the 'defining the users and establishing parameters for their work practices' during the development (Grint & Woolgar 1997). Altogether, following the SST tradition, the paper advocates a novel and fascinating conceptualization of the 'user', of her 'participation' in the development and of the relationship between technology design and use

The paper is organized as follows. The next section outlines the theoretical background of this research effort in more detail. The third section reviews the existing research on user participation in general and in OSS development in particular. The fourth section presents the research method utilized, the case involved in this study and the procedures of data gathering and analysis. The fifth section presents the results of the empirical examination. The final section discusses the implications and limitations of the results and outlines paths for future work.

## **Theoretical Background**

This paper analyzes user participation in OSS development by utilizing an approach that can be characterized as following the SST tradition (see e.g. Grint & Woolgar 1997; Bijker et al. 1994; Bijker & Law 1992; Williams & Edge 1996). The approach has been discussed in length by Iivari (2009b). This description is based on her description. The background of the tradition is in the research on sociology of scientific knowledge that maintains that scientific knowledge is socially produced; the approach being applied in the research on sociology of technology, which thus views technology as socially produced (Bijker et al. 1994; Grint & Woolgar 1997; Williams & Edge 1996). Within this approach, interpretive flexibility of technological artifacts is highlighted (Bijker et al.

1994; Grint & Woolgar 1997; Suchman et al. 1999) and instead of technological determinism, anti-essentialist perspective is advocated (Grint & Woolgar 1997).

The approach has been influenced by recent developments in literary criticism, feminist and media studies and generally in social sciences. However, increasing interest has been paid to this type of analyses also in information technology research (see e.g., Grint & Woolgar 1997; Suchman et al. 1999; Williams & Edge 1996), some studies also in the OSS context utilizing its constructs (Divitini et al. 2003; Sack, et al. 2006, Tuomi 2001), but not in the sense utilized in this paper. (Iivari 2009b.)

The approach often utilizes a metaphor of text in the analysis of technology and its development. The approach perceives technology as texts produced by writer-developers and read by reader-users. Textual determinism, however, is not assumed, but instead it is assumed that even though the writers encode a preferred reading into the texts, the readers can negotiate or oppose it as well as adopt it (cf. Hall 1980). In a situation in which the reader decodes the message in the terms in which it has been encoded, an ideal of 'perfectly transparent communication' is achieved (cf. Hall 1980: 136). However, the preferred readings offered may also be resisted, and the messages decoded in a negotiated or even opposing way (cf. Fiske 1987; Hall 1980; Hall 1997). (Iivari 2009b.)

Critical tradition suggests that the 'preferred reading' of a text is defined by the dominant ideology advocating the interests of the elite groups in patriarchal and/or capitalist society/organizations. Also in the information technology context one can also argue that the 'preferred reading' is encoded into the texts – preferred reading being in this case defined typically by the management. (Iivari 2009b.)

In this approach it is assumed that during the writing practice the readers are socially produced through offering them natural, obvious subject positions – making the text easy and obvious to make sense of (cf. Fiske 1987; Hall 1980; Hall 1997). The texts 'make sense the most,' 'become meaningful' and 'have effects' through these subject positions (Hall 1997b: 56.) The subject positions must be occupied and the messages decoded accordingly before the message can 'have intended effects' and 'be put to a 'use'' (cf. Fiske 1987; Hall 1980: 130; Hall 1997). However, people do not only adopt the subject positions offered to them, but they can also be questioned and challenged (Weedon, 1987; Weedon, 2004). (Iivari 2009b.)

The texts offer individuals forms of subjectivity through these subject positions (Foucault 1972; Foucault 1980; Weedon 1987). Subjectivity refers to the 'individual's sense of herself and her ways of understanding her relation to the world' (Weedon 1987: 32-33). Identity, following Weedon (2004: 19), is 'a limited and temporary fixing of particular modes of subjectivity'. Humanism assumes that people are 'sovereign, conscious, knowing, intentional individuals'; people are assumed to be 'knowing subjects' who are led by free will, reason, knowledge and experience, and who use language to express meanings (Weedon 2004: 8). Subjectivity is assumed to be unified and rational. It is assumed that there is a unique, fixed, coherent essence making people 'what they are.' However, within this theoretical approach it is instead assumed that subjectivity is fragile, contradictory and constantly constructed while people encountering different kinds of texts. (Hall 1997; Weedon 1987; Weedon 2004.) People are continuously persuaded to become subjects in the discourses that constitute individuals as 'subjects of certain kind.' Individuals are subjects in discursive struggle for their identity (Weedon 1987: 97). However, as mentioned, the persuasion of individuals as subjects is never final, but continuous and open to challenge. People do not only adopt the discourses and the subject positions offered, but the discourses can also be questioned and challenged. Prevailing notions may be contested as well as reproduced. (Weedon 1987; Weedon 2004.)

In this paper, it is assumed that during writing OSS texts, the OSS writers produce subject positions for the readers to be occupied, making the readers as subjects of certain kind'. By adopting the subject positions, the texts 'make sense the most,' 'become meaningful' and can 'have effects'. The subject positions produced in the OSS texts 'configure the reader', the OSS readers (their competencies, motives, tastes and aspirations) are defined and parameters for their reading practices are established. However, the subject positions can be negotiated and opposed as well as adopted.

## **User Participation in OSS Development**

### ***Introducing User Participation Literature***

The importance of user participation has been widely accepted both in IS and HCI research. The Scandinavian tradition in IS research, and the more recent Participatory Design (PD) traditions have been particularly influential in emphasizing active user participation in systems design (see e.g. Bjerknes & Bratteteig 1995; Greenbaum & Kyng 1991; Spinuzzi 2002). More generally in IS research; user participation has been a central topic for decades, but also currently a legitimate subject of study (Markus & Mao 2004). The field of HCI has also advocated user participation in approaches such as usability engineering (UE) and user-centered design (UCD) (see e.g. Beyer & Holtzblatt 1998; Nielsen 1993; Rosson & Carroll 2002). Within this field, however, user participation has traditionally been accomplished by ‘representing the user’ in the development (Cooper & Bowers, 1995), the responsibility to ‘represent the user’ being assigned to a group of specialists variedly labeled e.g. as usability/UCD/UE/HCI specialists (Iivari 2006). Due to these various background traditions advocating user participation, more detailed discussion revealing certain distinctions and differences is needed.

Generally, it has been argued that user participation aims at empowering the users, but the empowerment can be related either to democratic empowerment, which is connected to the users’ right to participate in decision-making in their workplace, or to functional empowerment, which is connected to the users’ right to be able to do their job effectively and efficiently, due to which useful and usable solutions are to be produced for them, and their participation in the design process is needed to achieve this (Clement 1994). Democratic empowerment of users has been the original goal of Scandinavian IS and PD traditions, but political issues have decreased in importance during the last few decades and instead the emphasis has shifted to supporting cooperative design process, in which users and designers are expected to jointly create new work practices and technologies, while also appreciating everyone’s expertise as valuable input (Bjerknes & Bratteteig 1995; Greenbaum & Kyng 1991; Spinuzzi 2000). Originally, a participative role (Damodaran 1996) was strongly advocated for the users: the users (or the trade unions) were positioned as active participants in the design process having decision-making power regarding the solution, but recently, however, also informative and consultative roles (Damodaran 1996) have gained legitimacy: the users have been positioned as providers of information and as objects of observation, or as commentators of predefined design solutions, but without having decision-making power regarding the solution.

As an addition to direct user participation in the design process, a number of different kinds of intermediaries have been identified in the literature – either to represent the users in the design process or to facilitate the cooperation between the users and designers. These intermediaries have been called user representatives or change agents in IS research, HCI/UE/UCD/usability specialists in HCI research, researcher-designers in PD research or ethnographers in computer supported cooperative work (CSCW) research (Iivari 2006; Iivari et al. 2009; Tuovila & Iivari 2007). As already mentioned, the HCI specialists are expected to ‘represent the users’ in the design process, i.e. they are assumed to gain an understanding of the users, their work practices and the context of use, and to deliver this understanding to design (Iivari 2006). It is expected that the HCI specialists first gain knowledge about the users, then design solutions (including both work practices and technologies) suitable for the users and finally evaluate the solutions from the viewpoint of the users (Iivari 2006). The ethnographers discussed in CSCW research are also assumed to provide ethnographic data to inform systems design (Iivari et al. 2009; Tuovila & Iivari 2007). The researcher-designers brought up in the PD literature, on the other hand, are expected to facilitate user-designer cooperation; they are expected to enable user participation, to ensure that everyone feels comfortable to partake and to ascertain that everyone’s skills and knowledge are equally valued (Iivari et al. 2009; Tuovila & Iivari 2007).

The role of these intermediaries can be classified in a similar way as is the case with users (Iivari 2006). Some of the intermediaries are expected to provide information (e.g. ethnographers and HCI specialists are assumed to deliver data to design based on their empirical studies) or to comment on predefined design solutions (e.g. HCI specialists are assumed to carry out different kinds of usability evaluations), but some might also be allowed to be in participative role: to actively take part in the design process and to have decision-making power regarding the design solution (e.g. the researcher-designers, who are assumed to execute design sessions together with users and designers) (Iivari 2006, Tuovila & Iivari 2007). Finally, a part of recent HCI literature suggests that design solutions should actually be produced by the professional HCI specialists, who are to have the power and authority to produce such a solutions that suit the users (called e.g. interaction designers) (Iivari 2006). They are expected to

have 'knowledge about the user' and general state-of-the-art HCI knowledge, through which they can claim to be well-equipped to 'represent the user' and produce suitable solutions for them (Iivari 2006).

### ***OSS Literature on User Participation***

As mentioned, it has been argued that user participation is an integral element of OSS development. Indeed, all users are potential developers in the OSS development context. However, it has also been reported that in practice up to 90% of users might be 'passive users' who merely use the solution and take no part in its development (Nichols & Twidale 2006). Furthermore, there might be 'lurkers' observing the development and the associated discussions, 'readers' also reading the source code and trying to understand the system without developing it, 'bug fixers' and 'bug reporters' contributing by fixing or discovering and reporting bugs, 'peripheral developers' occasionally contributing code, 'active developers' carrying out the main part of the development work, and the 'project leader' and 'core members' forming the most influential group making decisions related to what should be included in the code base (Ye & Kishida 2003; von Krogh et al. 2003).

OSS development takes place in distributed environment in the Internet utilizing its existing means for communication and coordination. Especially means for version control, bug reporting and communication are needed. These systems enable also user-developer cooperation. Users can ask questions and help e.g. through chat, mailing lists, bug reporting and feature request systems and discussion forums. On the other hand, through these same means the developers can provide user support and gather user feedback. (Ge et al 2006; Lakhani & von Hippel 2003; Ye & Kishida 2003; von Krogh et al. 2003.)

However, user participation through these means has proven to be problematic. Some users do provide and gain information and help through these means, but it has been reported that communicating to the development might appear as complicated or scary for the non-developer users (i.e. to use the mailing lists and bug reporting systems available in the Internet) (Benson et al. 2004; Cetin et al 2007; Nichols & Twidale 2006). The users might not even be aware that there exists such means for user-developer cooperation.

One solution for enabling the participation of these users has been to invite some sort of intermediaries to take care of user participation. Particularly HCI specialists have been discussed in the literature (Andreasen et al. 2006; Benson et al 2004; Cetin et al 2007; Twidale & Nichols 2005; Zhao & Deek 2005). This literature acknowledges that just getting the users involved is not enough because they are not trained for developing and ensuring usability, even though they are the ones who run into the usability problems while using the system (Zhao & Deek 2005; Zhao & Deek 2006). However, the participation of the HCI specialists in OSS development has also proven to be problematic. It has been reported that typically the HCI specialists do not participate in the development, and if they do, they tend to be isolated, alienated and without decision-making power (Benson et al. 2004; Bødker et al 2007; Cetin et al 2007; Nichols & Twidale 2006; Twidale & Nichols 2005; Viorres et al 2007).

## **Research Design**

This study relies on the interpretive research tradition, in which it is assumed that 'our knowledge of reality is gained only through social constructions', and the researchers aim at understanding and making sense of the world, not at explaining in the sense of predicting (Klein & Myers 1999: 69). The researchers are interested in the meanings that are attached to the phenomenon studied at the local level, the role of theories being only to act as sensitizing devices (Denzin & Lincoln 2000; Klein & Myers 1999). The researchers strive towards the native's point of view, thick descriptions, and thorough understandings of particular cases (Denzin & Lincoln 2000; Klein & Myers 1999).

The case analyzed in this paper is an OSS development project developing a desktop application to be used by end-users for entertainment purposes ([www.sourceforge.net](http://www.sourceforge.net)). One could assume that people without any technical knowledge or programming skills could be interested in using the solution. The project has also shown interest in their users and their feedback regarding the solution. The project is listed in a website requesting usability support from HCI specialists to OSS projects. In addition, a usability discussion forum has been established over three years ago in the project website, asking the users of the OSS:

“We would like to invite our users to participate in further improving the program. Do you have a suggestion how usability could be refined? Is there some peculiarity in the GUI that really upsets you? This is the place to discuss!” (Developer)

In total, over 1600 messages and nearly 400 topics had emerged in this discussion forum during the time of data gathering. The project website is, overall, active with around 20 000 messages and several thousand registered members contributing to different forums in the website. Nearly 600 message senders have contributed to the usability discussion forum alone. The project is a small but active one: there are 9 people defined as developers in the project, the development status being 5 (production/stable) with an average around 3500 downloads a month ([www.sourceforge.net](http://www.sourceforge.net)). As a whole, this OSS project is a small, active, user and usability oriented OSS project. The project was selected, since it is already known that in large projects or in projects, where companies are involved, there tends to be HCI resources available for taking care of user contacts (see Benson et al 2004; Frishberg et al. 2002; Iivari et al. 2008; Nichols & Twidale 2006), but in this case, the project being small and without corporate resources, interesting data on how an OSS project initially tries to deal with their users can be gained.

All messages of the usability discussion forum were saved and printed out for the analysis purposes. The analysis was interpretive and data driven, the focus being on meanings held by the people within the case studied. In interpretive, data driven research it has been recommended that one should take care that the existing theories do not restrict the data gathering and analysis, but it has also been acknowledged that this is impossible, since researchers' prior knowledge and assumptions always direct the interpretations. Yet, the researchers should attempt to be as unbiased and unprejudiced as possible during the data collection and analysis, even though they necessarily are relying on their existing theoretical concepts and understandings. (Denzin & Lincoln 2000; Klein & Myers 1999; Walsham 1995.)

The data analysis proceeded the following way. First, the researcher familiarized herself with the discussion forum and the message senders. All messages of the discussion forum were printed and read thorough. Related to each topic and messages in it, the sender of the message was documented as well as all the repliers and the content of the message. Also different forms of user participation in this OSS project were examined by focusing on why and how (in which roles) the users participated in the development. After this examination, it became evident that there were few very intense moments in the project, when the developers and users actively discussed and argued over issues related to the solution in the discussion forum. These moments were temporally very close the release of new major versions of the software. These moments were selected to be analyzed more thoroughly from the viewpoint of user participation in 'configuring the user'. Therefore, a very detailed analysis regarding the discussions between users and developers in these few selected topics was carried out. The focus was on the negotiation on who 'the user' is made to be and how the interaction between the users and the developers occurs. Existing literature on user participation in 'configuring the user' was used as a sensitizing device in the analysis.

## Empirical Findings

### *Introducing the Discussion Forum*

The discussion forum has already been characterized in Iivari (2009a). First some descriptive data of the discussion forum messages and message senders (including both OSS developers and OSS users) is offered in table 1 (see Iivari 2009a: 139).

Table 1. Descriptive Data of the Discussion Forum (Iivari 2009a: 139)		
	#	%
<b>Message senders</b>		
Newbies	282	48,70%
Guests	274	47,32%
Members (incl. developers)	23	3,97%

Developers	2	0,12%
<b>Messages</b>		
Guests' or newbies' messages	1102	67,70%
Members' messages (inc. developers)	526	32.30 %
Developers' messages	192	11,79 %
<b>Content</b>		
Feature requests related to the OSS	499	30.65 %
Problems related to the OSS	300	18.42 %
Helping	177	10.87 %
Thanking and praising the OSS	113	6.94 %

Most of the message senders are labeled as 'newbies' or 'guests' in the discussion forum. This means that the message senders are newcomers to the discussion forum (according to the number of the messages they have sent) or just visiting the site without registering. Later on, the people can become members, and in the OSS context, also OSS developers. In this forum, only two people are defined as OSS developers, some of the members also having positions as 'administrators' or 'moderators'. Most of the messages have been posted by the 'newbies' and 'guests'. They have also initiated most of the topics. The developers and members for the most part reply to these messages, which is typical in the OSS discussion forums (cf. Ge et al 2006; Lakhani & von Hippel 2003; Ye & Kishida 2003). In the OSS development context, there also is the possibility to lurk i.e. to join the mailing lists and to observe the discussions in the discussion forums (von Krogh et al. 2003) without taking any part in the discussions or in the development. Many topics in the discussion forum have gained several thousand views (i.e. they have been read several thousand times), the most popular topics even tens of thousands. This indicates that also in this discussion forum there might be a large number of 'lurkers' observing the discussions, in addition to the 'guests', 'newbies' and 'members' taking part in the discussions.

Regarding content, as mentioned, the forum begins with the invitation from one of the developers to users to participate in further improving the program. All the messages posted to this forum were included in the analysis and their content was categorized through inductive analysis. Data driven reasoning resulted in the identification of four categories into which a large proportion of content of the messages fitted (Iivari 2009a). The categories are: problems, feature requests, thanking, and helping, which are briefly described next. In the feature request category, different kinds of features are requested. In the problem category, different kinds of problems are expressed. The sender does not know how to use a particular feature or the OSS altogether, or he/she does not like a particular feature or the OSS altogether. The helping category is related to either problem or feature request messages, the sender offering advice for the original sender. Finally, many senders start or end their message by thanking the developers and/or praising the OSS as the best one available. (Iivari 2009a.) The thanking messages might be characteristic to the OSS discussion forums, since the OSS developers are not paid for their work, but instead their own needs and the reputation gained motivates them; a large user base is important socially and psychologically, and it motivates the developers, since it is a flattery and reward (Ye & Kishida 2003).

The interest this OSS project has in the 'user' is indicated through the existence of this discussion forum dedicated to usability issues and initiated by asking the users to take part. The developers invite the users into a consultative role (Damodaran 1996) to contribute to the project. Furthermore, especially users labeled as 'novice', 'non-technical' and 'typical' are discussed in the discussion forum (Iivari 2009a). In some of the messages, the message senders label themselves as 'novice', 'non-technical' or 'typical' users and thus describe their own needs, preferences and problems related to the OSS.

"This is an account of my experience trying [the application], specifically for [a feature], as an inexperienced [the application] user, hopefully it will be food for thought when considering user interface improvements to [the feature]." (Newbie)

“Hmmm... I really am a total neophyte in terms of Linux & in terms of anything involving terminal/command line programming. I tried setting up mySQL using two sets of instructions, slightly different from each other... (...). Neither one of them worked. (...) A basic question: if I did all this stuff in the terminal, did I completely screw up my internal operating system?” (Newbie)

Sometimes the senders also provide lengthy descriptions of the context of use, of their characteristics or of the different steps they have taken in trying to use the OSS, e.g.

“Hi, I have recently set up a Linux box running [the application] (...) in [place] at [place]. This works really well with people being able to [do something] and [do something]. However, I have noticed that people (who for the most part have never used [the application] before) get confused about [an issue], and so proceed to [do something]. When they finally figure out where to [do something], [they have done something], which means that when they [do something], it does not [happen]... Confusion occurs, and I usually have to come there and handle the things. So my question is this: Is there a way to hide [an element] from the main window?” (Newbie)

However, as a whole there are very few messages containing this type of contextual information.

Furthermore, in other messages the message senders do not claim to represent these user groups, but they still provide data related to them. In many of these messages, however, the ‘novice’, ‘non-technical’ and ‘typical’ users are discussed in abstract, without offering any empirical evidence. It seems that these messages offer only opinions or stereotypes.

“The position of the toolbar buttons is still wrong. While most applications out there place their toolbar buttons at the top of the application below the menu bar, [this application] places them at the bottom above the status bar. Newcomers may feel not comfortable with the fact that the application doesn't behave the way they expect it to do.” (Newbie)

“Imho [in my honest opinion] a lot of people would like to have such a tool.” (Newbie)

However, in some messages the senders provide also empirical evidence: they describe how they have observed other people behave or how other people have described their behavior, problems or needs.

“When some friends who don't know [the application] try to use it on my computer, they ALWAYS do the same: they look for [something] on [a folder], find [a file], then double click... And wtf [what the fuck], nothing happens, what is wrong? I think this is not logical at all.” (Newbie)

“This is isn't really for me more than for my wife. My wife uses Mac (now broken) and therefore uses [another application] and is used to the functionality of it. A lot more non-technical users are coming to Linux and I just think that the software available for it should be ready for them.” (Newbie)

Altogether, in most of these messages, user feedback to the predefined design solutions is offered, positioning the sender, again, in a consultative role (cf. Damodaran 1996). The senders, who describe issues related to the ‘novice’, ‘non-technical’ or ‘typical’ users not claiming to resemble these users themselves, have acquired the position of an intermediary delivering user data to the development (Iivari 2009a).

Furthermore, there are also users in participatory role (Damodaran 1996) in the OSS project. These users actively take part in the development work, even though not having decision-making power regarding the solution. They contribute code, mock-ups and design suggestions in the discussion forum:

“Hi! I miss two things in [the application]: [a feature] and [a feature]. (...). We can do this with [the application] by right-clicking -> (...) but that's too many clicks for me 😞. I made a small patch [a link is provided] to handle that.” (Guest)

“I've done the following shoddy mock-up: [a link to the mock up is provided]. Reason: The \*main\* thing people do with [the application] is [doing something]: it feels \*odd\* that the [...] button [...] and everything is at the bottom of the screen.” (Guest)

This type of user participation has been the reason for labeling OSS development as 'user-driven'. However, these users do not represent the non-developer users that are in the focus in this paper. These, technically capable users, clearly can contribute by utilizing the existing means already available in the OSS projects. Furthermore, not even these users are allowed to make decisions regarding the solution. The possible project leader and the 'core team' of developers make all the decisions related to what to include in the code base (Ye & Kishida 2003). This is also the case in this project. The developers invite the users to contribute, but they alone made the decisions related to what to include in the code base. For example, the developers may simply reply to the users design solutions or ideas:

“Quite simply, I don't like it. Too messed up. Have you checked out our mock-up for [a version]? (...) This is what we're currently implementing for [the application]. Thanks for the effort though 😊” (Developer)

On the other hand, the developers have also taken some suggestions into account, replying to request:

“Good idea, done 😊.” (Developer)

As mentioned, the analysis focused on few moments, during which intense discussions between the developers and non-developer users have emerged regarding 'configuring the user'. Altogether, each message in the discussion forum has gained around 3 replies on average. There are a lot of messages without any replies. However, the most intense topics include even 61, 53 and 42 replies to the original message. Two of them handle requirements for a new major version of the OSS. In the first case, the solution is under development during the discussion, which was initiated by one of the developers. The discussion lasts, altogether, for four months, including altogether 62 messages. In the second case, which takes place after two years of the first intense discussion, a new version has just been released, and one of the users initiates the discussion. The discussion lasts for one month, including altogether 43 messages. The third very popular topic (including 53 replies) deals with enabling the use of the software in Windows environment. This topic deals with very interesting issues related to OSS philosophy and the identity of OSS developers and users in general, but the first mentioned two topics are strongly related to the 'configuration of the user' in this particular OSS. Therefore, they are analyzed in more detail in this paper.

### ***Proposing Features for a New Version***

In the first topic, initiated during the development of a major release, around 68% of the messages include feature requests, 16% describe problems, 16% provide help and 16% thank the developers and/or the OSS. Therefore, in this topic the feature requests clearly dominate compared to the overall results of the discussion forum. The helping and thanking messages are also over-represented in this topic. The large number of feature requests in this topic is quite natural, since the topic is initiated by a developer asking for improvement ideas from the users. Regarding the message senders, altogether 32 message sender nick names have contributed to the topic. Most of the message

senders are guests or newbies, 84% and 9% respectively. Only one developer and one member have contributed to the topic. However, they have been active posters, the developer posting 5 messages and the member even 9 messages, while the newbies and guests only 1,6 messages on average.

Regarding the content of the messages on a more detailed level, three most popular ideas are related to: editing information in a faster and easier way (in 13 messages), reorganizing the main window of the application (in 11 messages) and providing keyboard shortcuts (in 9 messages). Altogether, faster and easier use of the application is emphasized a lot. Both the users and the developers position the users as 'efficiency hungry [application] users', who wish that the software enables keyboard shortcuts, fast editing and automatic information update. The developers and the members respond remarkably positively to these requests, showing they agree with the ideas. Below, some example discussions are presented:

"To edit [information] which is not in the first column, a mouse is required." (Guest)  
(...)  
"You can tab between (...) editing columns, no mouse is required. (...) I can fix some of it and have had it on my TODO for some time." (Member)  
(...)  
"I never thought about using the tab in the edit mode - thanks for this information. Now I found some odd behaviors with this feature: (...)" (Guest)  
(...)  
"In [the application] CVS there's now a second (...) editor. (...) Please test 😊" (Developer)  
(...)  
"Sounds great - I will try it in the next days. (...) If (...) development goes on like this, [the application] will be the best [application] on earth ;-)" (Guest)

As one can see, the developer has even provided a second editor in trying to fulfill the users' wishes, due to which one can argue that in this OSS project the development clearly tries to please the users. Another positive response to the user's request is illustrated below:

"How about a "slow double click" feature to select (...) for editing? Much easier than right click or click-F2... And what about a keyboard shortcut for selecting the next (...) in the same column?" (Guest)  
(...)  
"Not tried TAB?" (Member)  
(...)  
"I have in fact tried tab, and (...) and it's very useful, although it doesn't ignore hidden categories, perhaps an odd design decision. (...) Maybe I'm an atypical user; I'd like to jump to the next row, same column... (...) Also u may not have understood what I meant by slow double click... click once, wait more than for a double click, and click again, hence selecting (...) for editing" (Guest)  
(...)  
"Ahh yes, sorry. Too much to do too little time 😊 Yeah I like your idea on using the keyboard navigation like that. (...) I can try hacking it." (Member)

In some messages other applications are brought up as ideals, but this does not receive very positive response from the developers. It is emphasized that instead of imitating other applications, separation from them is needed.

“There is just only one thing that I think is missing: I would like a way to view [an issue] like in [another application].” (Newbie)

(...)

“I would like a way to view [an issue] like in [another application]. [quote] Another vote for it.” (Guest)

(...)

“[This] is unlikely to happen really. Sorry.” (Member)

(...)

“[This application] uses a different (...) concept. [The other application] has a [the issue], not much point in us reinventing another wheel.” (Member)

In all, in the discussions, fast and easy use of the OSS is emphasized. The developers also seem to appreciate it, responding quite fast to the requests of the message senders. However, some issues are rejected by the developers. Those are mainly conflicting with the characteristic features of this particular OSS, separating it from other, similar type of applications.

### ***Trashing the User Interface of a New Version***

In the second topic, initiated after the release of a major version, only around 23% of the messages include feature requests, 51% describing problems related to the OSS. 16% provide help and 7% thank the developers and/or the OSS. Therefore, in this topic the problem messages clearly dominate compared to the overall results of the discussion forum. The large number of messages outlining different kinds of problems in this topic is quite natural, since the topic is initiated by a user trashing the user interface of the new version. Regarding the message senders, altogether 24 message sender nick names have contributed to the topic. Most of the message senders, 87,5%, are again newbies (registration has been made compulsory, due to which guests can no longer post messages to the discussion forum). No developers, but three members have contributed to the topic. The members have been more active posters, posting 2,7 messages on average, while the newbies only 1,7 messages on average.

The most popular issues discussed in this topic are related to: enabling the users to select/configure the user interface according to their preferences (in 14 messages), arguing for reorganizing the main window of the application (complaining about a wrong positioning of an element in the user interface and arguing for more space for an important element in the user interface) (in 16 messages) and arguing for the new solution that is being trashed by others (in 6 messages). The existing solution is mostly blamed for being messy, necessitating a lot of scrolling, and providing too much space for a less important element and too little space for the most important element:

“The new placement for [an element] is a mistake!!!! Please go back to the previous version! 😊 (...) I want wide [an element] and automatically [another element] is wide and it looks ugly! Second thing: I want to have long [element] and long [another element] (...) Now it's impossible! 😞” (Newbie)

(...)

“I totally agree. The new (...) layout makes the user interface a total mess. The old interface is much better. Now it is ugly.” (Newbie)

(...)

“I also agree, it's very messy! Can't even read (...) without scrolling.” (Newbie)

(...)

“Hi there, compiled and installed [a version] today, 'cause I was interested in the new layout. Guys, what kind of stuff are you smoking? This layout is absolutely f\*\*\*ed. There's so much useless space in the (...) Why changing the old layout? That makes no sense at all. As far as I can see (not very far), there are no

positive consequences of that sh\*\*\*(😞)” (Member)

(...)

“The new design wastes space (...). [The old layout] just makes sense; the way it is organized follows the content. It's usable, everything is in one quick view, the (...) is the center, everything else floats around.” (Newbie)

During the discussion, two kinds of users are constituted; ‘wide’ and ‘narrow’ layout users. The wide layout users are argued to form a majority and they, altogether, are positioned as ‘*the users*’ of this application, appreciating the wide view enabling to see all the important information at one glance’:

“Just speaking for myself: Yes, I need the window that large, as I [want] to have as much information directly accessible in my "media central" as possible. ;-) (...) Its people using a narrow vs. people using a wide (...) layout. I guess the majority of all users prefer the latter just because: (...) a wide layout makes more information available at a glance. (...) Being able to show more columns, as well as having the [element] and the [element] present at the same time without the need to scroll down to see most of the available information.” (Newbie)

“My point is: The old interface gives a clear and nice two-sides-layout, being able to show everything important at a glance. The new solution needs user interaction most of the times, be it scrolling down things or resizing areas to better fit a new context.” (Newbie)

The message senders also argue for the possibility to select or configure the layout according to their preferences, which in this situation refers to the possibility of using the old, ‘classic’ layout:

“I hope you make it possible in the future that the "classic" layout also can be selected.” (Newbie)

“As long as the next interface redesign is flexible enough to allow the end user to customize it (...), I'll be happy. This "cramming a major UI redesign into people's throats" business in [a version] was simply not nice.” (Newbie)

“People running a lower resolution (...) should have the possibility to adjust their favorite [application] the way it suits them best - but not at the cost of serving the majority (...) of all users a suboptimal experience. Of course it would be best to make all this configurable, tabs swappable and so on.” (Newbie)

The developers, again, seem to be quite responsive to the user comments, since quite soon it is reported:

“FYI: Latest SVN reverted the old style.” (Member)

“[A developer] committed changes (...). Revert back to old GUI layout, to prevent further street riots and civil war. (...) I downloaded the last svn version of [the application] and really it has the old GUI style. Thanks.” (Newbie)

Therefore, also the developers accept that the users of this application appreciate the wide view enabling to see all the important information at one glance, without necessitating a lot of scrolling. The users successfully resist the new, altered solution. However, some message senders complain about changing so fast back to the old layout, but it does not affect the decision anymore:

“Wow. People complaining about a beta? Play with it a little, experiment with different ways of organizing your space. (...) At the moment, it would be really good to hear whether anyone would be interested in actually having a go at changing around what's shown, or even producing some mockups, instead just flying off the handle because you're too scared of change. Live on the edge!” (Member)

“I quite liked the [new layout], and find it sad that it was trashed so fast, just because people couldn't get that the [element] could be rearranged. “ (Newbie)

This observation is related to many other issues changed according to the user request as well: the developers have to rely on very few user comments when making decisions.

## Concluding Discussion

This paper has examined user participation in OSS development. The empirical results are summarized in table 2.

<b>Table 2. User Participation in 'Configuring the User'</b>		
	<b>Description</b>	<b>Empirical Examples in the OSS Project</b>
<b>Configuring the User</b>	<ul style="list-style-type: none"> <li>- Defining the users and setting parameters for their work practices through subject positions offered in the text</li> <li>- The users can adopt but also negotiate and oppose the subject positions offered</li> </ul>	<p>Configuring the users as media consumers</p> <ul style="list-style-type: none"> <li>- Efficiency hungry 'media consumers', need to be able to do things fast and easy, prefer automation (keyboard shortcuts, fast editing, automatic information update)</li> <li>- Wide layout 'media consumers', want to see and control everything at once at their clear 'media center' (seeing everything at one glance, not needing to scroll much, being able to configure the layout, prefer 'clear' instead of 'messy')</li> </ul> <p>Users negotiate and oppose some configurations (unsuccessfully recommending to imitate other applications, successfully resisting the new layout)</p>
<b>Motives for User Participation in Configuring the User</b>	<ul style="list-style-type: none"> <li>- The users are to be democratically empowered to take part in decision making regarding the subject positions offered in the text</li> <li>- The users are to be functionally empowered to indicate what kind of subject positions are natural, obvious and understandable for them</li> </ul>	<ul style="list-style-type: none"> <li>- The users are (partly) democratically empowered to take part in decision-making in the discussion forum regarding the subject positions offered in the text, but probably not all users are aware of this possibility and the users do not have decision-making power regarding the matter</li> <li>- The users are functionally empowered to indicate what kind of subject positions are natural, obvious and understandable to them in the discussion forum, but the users do not have decision-making power regarding the matter</li> </ul>
<b>Practices of User Participation in Configuring the User</b>	<ul style="list-style-type: none"> <li>- The users are to take part in informative, consultative, participative or configurator roles in 'configuring the user'</li> <li>- The users are to be</li> </ul>	<ul style="list-style-type: none"> <li>- The users are mainly in consultative role indicating what kind of subject positions are preferred and understandable to them, but few users are also in informative or participative roles, indicating what kind of other forms of subjectivity the users have adopted or producing texts that advocate particular forms</li> </ul>

	represented by intermediaries (e.g. HCI specialists), who are to take part in informative, consultative, participative or configurer roles in 'configuring the user'	- The users are represented by other users, who are in consultative role, indicating what kind of subject positions are preferred and understandable to the 'represented users'
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Based on the results one can conclude that OSS development in a certain sense enables active and effective user participation in 'configuring the user'. The OSS writers have encoded preferred readings into the OSS text; but the readers have negotiated and even opposed them as well as adopted them (cf. Hall 1980). In certain situations, their opposition has actually affected the solution, showing that user participation has been effective.

The users have taken part in 'configuring the user' mainly in the consultative role (cf. Damodaran 1996): they have extensively commented on the predefined design solutions. Regarding their informative and participative roles, not much evidence could be gathered from the case. Occasionally the users might have described issues related to themselves, their characteristics, goals and needs and the context in which the solution is used in informative role, but mainly their descriptions concentrate on commenting the existing solution. Furthermore, the role involving users actively taking part in writing the OSS texts, having also decision-making power regarding the text, is not observable in the case. Some technically skilled users provide code, mock-ups and design suggestions to the OSS project through the discussion forum in a participative role, but it became evident that they still do not have the ultimate decision-making power related to what to include in the code base. Therefore, the few defined developers (who, in the OSS development context supposedly are also users themselves) are in the 'configurer role', making all the decisions related to the 'configuration of the user'.

Related to the adoption of the subject positions offered in the text, generally, one can argue that the thanking messages posted to the discussion forum indicate that the subject positions have been successfully adopted. They highlight how satisfied the users are with the software. Altogether, in the messages posted to the discussion forum the users reveal that they have accepted the subject position offered to them, them selecting this application instead of many alternative solutions. However, one needs to underline that this applies only to a certain extent. The subject positions offered to the readers are for the most part adopted; for example certain kind of organization of the user interface, enabling viewing a lot of information at one glance, and fast and easy use of the software are acknowledged as important both by the developers and by the users, but the developers and the users do not agree on all matters. For example, the requests for imitating other applications are not received well by the developers. Preserving own identity is emphasized as important, instead. Therefore, the developers, even though responding very fast and positively to the users requests in general, do ultimately make their decisions based on their own judgment. It seems that the users' requests need to be within the range of acceptable requests in the first place to be included in the solution.

On the other hand, since the users have generally adopted and accepted the solution, certain major changes make them react very strongly and negatively. Their outburst eventually leads the developers to abandon a major change. This, in turn, makes some users disappointed, them preferring the new solution. This situation emphasizes the difficult position of the developers as the ultimate decision-makers 'configuring the user': the developers have to rely on very few user comments when making decisions (in this case, actually based on 20 messages complaining about the change). More empirical user data gathered and properly analyzed would help in this situation a lot, but this kind of gathering and analysis is typically done by the HCI specialists in software development (Iivari 2006). In OSS projects, there typically are no HCI specialists involved, which is the case also in this project. The findings of this paper, in any case, highlight the need of attracting some sort of intermediaries, e.g. HCI specialists, to contribute to OSS development, in line with many other researchers (Andreasen et al. 2006; Benson et al 2004; Cetin et al 2007; Twidale & Nichols 2005; Zhao & Deek 2005). The HCI specialists could gather data about the users, their preferences, skills, goals and the context of use, and based on this understanding, indicate what kind of subject positions would be preferred by the users (cf. Fiske 1987; Hall 1980; Hall 1997).

The SST oriented theoretical background succeeded in providing interesting findings by sensitizing to the constant negotiation and modification that takes place related to the subject positions offered to the users in the OSS texts as well as in other kind of technologies. This paper introduces an intriguing conceptualization of the relationship between software development and use, having also clear implications on the conceptualization of user and her participation. It is assumed that software development involves constant production and reproduction of modes of

subjectivity to the readers, the readers adopting, negotiating or even opposing them. People's subjectivity, as mentioned, is perceived as fragile, contradictory and constantly constituted and reconstituted, through people encountering different kinds of texts (through technology use among other activities). People are not viewed as sovereign, conscious, intentional individuals who are solely led by free will, reason, knowledge and experience, and who use language merely to express meanings. Instead, it is assumed that people are continuously persuaded to become subjects in the discourses that constitute individuals as 'subjects of certain kind'; individuals being subjects in constant discursive struggle for their identity (cf. Weedon 1987: 97). However, the persuasion of individuals as subjects is never final, but continuous and open to challenge. People do not only adopt the discourses and the subject positions offered, but the discourses can also be questioned and challenged (Weedon 1987; Weedon 2004).

Therefore, it needs to be noticed that software texts, among other texts, take part in this discursive struggle for people's identity. In software development in general, there tends to be no possibilities for people to take part in the construction process or to influence the subject positions offered to them. OSS development provides unique opportunities for the users to affect what kinds of forms of subjectivity are offered to them. However, as mentioned, the users who are involved in the process in the discussion forums in OSS project websites probably do not represent very well the non-developer user population, whose participation was emphasized as crucial in the introduction of this paper. However, through these means, the non-developer users can be attempted to be contacted as well, and also they can be attempted to be invited into the constant, continuous negotiation and modification that takes place related to the subject positions offered to the users in the OSS texts. As mentioned, in OSS discussion forums there might be large number of 'lurkers', who are observing the discussions even though not (yet) taking any part (cf. von Krogh et al. 2003). This population might form a huge potential for more wide spread user participation in OSS development: these 'lurkers' can start posting messages to the OSS discussion forums at any time.

This type of user participation could be put on trial in other IS contexts with somewhat similar characteristics, such as distributed IS, product or web development contexts, in which the user populations tends to be large and/or geographically scattered, and for these reasons difficult to be in contact with. The type of user participation encountered in the OSS development context could be highly useful in these IS contexts, including the 'user representation' work carried out by the intermediaries who are actually users 'representing other users'. Support for this kind of user representation work is, nevertheless, needed. This could be provided, among other things, by building up an internet environment resembling that used by OSS projects. OSS projects typically use OSS tools for communication and coordination of their work, which means that these tools are freely available to be used in other IS contexts as well. The environment should allow the users to provide information in informative and consultative roles as well as to provide design suggestions. Important, however, is also to ensure that the user participation is effective; the users need to see that their contribution has some effect to motivate them to continue this work. Even though the users do not have the ultimate decision-making power in the OSS projects either, they, nevertheless, need to see that their contribution is received and processed somehow. Therefore, the development side needs to appoint people for communicating with the users in the environment, or at least define this as certain role's responsibility.

There are certain limitations that need to be outlined. First of all, it is emphasized that the metaphor of text adopted in this paper clearly makes one to see and understand phenomena in a distinctive and very partial way (Morgan 1986). Morgan (1986) highlights that our theories and explanations of organizational life are inevitably affected by the metaphor selected, and while selecting one way to see a phenomenon; many other ways are left out. Foucault (1972: 118-119) maintains that 'everything is never said' and 'few things are said of the totality', implying that a multitude of ways is always necessarily excluded. This paper has concentrated on conceptualizing the relationship between people and technology from the viewpoint of identity formation and negotiation, leaving out many aspects from the viewpoint of interacting in the material world. Another limitation is that this paper provides findings from only one case. More cases will be included in the future to gain more generalizable results, even though it is also emphasized that detailed analyses of individual cases provide valuable insights that are of use in other settings (cf. Walsham 1995). Paths for future work include also deepening the understanding of the current as well as prospective forms of user participation in the OSS context, and devising methods and tools enabling user participation in a more systematic way in OSS development as well as in other IS contexts with similar characteristics. Furthermore, the role of 'professional intermediaries', e.g. HCI specialists, in OSS development should be empirically examined in cases in which it has actually realized. Moreover, prospective empirical analysis could concentrate on the discussions between users and developers even on a more detailed level, taking into account the use of the emoticons in the discussions. Additional path is further empirical experimentation with the theoretical framework outlined in this paper, in the OSS development context as well as in other IS contexts. Especially a discourse analytic approach relying on Foucauldian tradition will be utilized in the future.

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