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# Transactions on Human-Computer Interaction

THCI

Theory & Review

## Bringing Discourse Ethics to Value Sensitive Design: Pathways toward a Deliberative Future

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### Abstract

Value Sensitive Design (VSD) is a comprehensive framework for advancing a value-centered research and design agenda. It provides methods for producing and evaluating a design outcome by taking human values into account. Drawing on discourse ethics, this paper first critically analyzes the status quo in VSD and identifies some gaps. These mainly concern the lack of explicit methods for supporting a deliberative and legitimate process of decision making with respect to many concerns, including the identification of stakeholders, the legitimation of common design communication, the justification of trade-offs and/or a common regulation in case of competing or incommensurable values, as well as the deliberativeness of other design decisions such as the selection of design goals and means. In addition, this paper suggests ways to move VSD toward the standards of discourse ethics by drawing on the knowledge base of critical research in the Information Systems field. In particular, the suggestions concern the inclusion of a practical method for boundary critique and different types of discourses and principles as well as discourse support methods and tools for structuring participation in a way that allows participants to deal with the plurality of values, norms, goals and means deliberatively. Finally, this paper revisits a VSD case and explores the applicability of the ideas suggested.

**Keywords:** Values, value sensitive design, methodology, discourse ethics, critical research, reflective practice

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## INTRODUCTION

There has been an increasing interest in considering human values and ethical issues in the design, development and use of information technology (e.g., Hirschheim and Klein, 1994; Friedman, 1997; Sellen et al., 2009). The value-related research interests include: understanding the meaning and components of specific values such as fairness, privacy, trust, security (e.g., Palen and Dourish, 2003; Nissenbaum, 2004), investigating users' experience of values in interaction with technology (e.g., Orlikowski, 1992; Zheng et al., 2002), understanding the impact of values and value conflicts (e.g., Kling, 1978; Kumar and Bjorn-Andersen, 1990; Leidner and Kayworth, 2006), proposing methods for dealing with value conflicts deliberatively (Klein and Hirschheim, 2001; Yetim, 2006), and suggesting technological designs to support specific human values explicitly (Borning et al., 2005; Miller et al., 2007; Kobsa, 2007). Finally, there are also works that investigate design methods for incorporating social values (Mumford, 1983; Hirschheim and Klein, 1994; Flanagan et al., 2005; Friedman et al., 2006b). Many of them illustrate that values matter to people and that unaddressed value tensions may have negative consequences for the implementation and use of information technology.

Among approaches that value the consideration of human values in system development, including approaches to user experience design and participatory design, only a few are explicitly concerned with the development of methodological guidelines for systematically identifying, designing and evaluating values in the development of systems (see, Kujala and Väänänen-Vainio-Mattila, 2009 and Yetim, 2011a for a review). The Value Sensitive Design (VSD) methodology developed by Friedman et al. (2006b) is viewed as the most comprehensive framework for advancing a value-centered research and design agenda within the context of Human-Computer-Interaction (e.g., Le Dantec et al., 2009). It includes conceptual, empirical and technical investigations and seeks to design technology that accounts for human values in a "principled and comprehensive" manner throughout the design process. The consideration of the three distinct areas of investigation and the assembly of these separate methodological perspectives for dealing with value issues is part of what makes VSD as an attractive candidate when contrasted with other available approaches (Yetim, 2011a). Moreover, VSD is mature enough to be considered for a critical analysis as it has already been applied to a range of technologies, including network browser security (Millet et al, 2001), urban simulation (Borning et al., 2005), large displays (Friedman et al., 2006a), computer-supported cooperative work (Miller et al., 2007), mobile phone parenting safety technologies (Czeskis et al., 2010), and implantable medical devices (Denning et al., 2010). The design and evaluation of methods and methodologies is at the center of design science research (Hevner et al., 2004). It is, therefore, worthwhile to critically assess the merits and limits of the VSD methodology and to seek possibilities for its advancement.

The purpose of this paper is to critically examine the VSD methodology by taking a global perspective and drawing on discourse ethics as developed by Habermas (1990, 1993, 1996). In taking such a perspective, we see an opportunity to give fresh impetus to the advancement of VSD. The rationale for the choice of the discourse ethics is as follows: First, discourse ethics is one of the most important attempts to identify and ground moral principles in the globalized world (Benhabib and Dallmayr, 1990). It claims to be universalistic and not limited to a concrete historical epoch or culture. Second, it takes the diversity of values into account and suggests structures and procedures for critically evaluating values and norms and for generating a common orientation. Third, discourse ethics is consistent with the current VSD framework as Friedman and colleagues (e.g., Borning et al., 2005) refer to Habermas's (1984) work as a promising concept to address issues of legitimacy, yet, they do not pay any further attention to the consequences of discourse ethics for VSD, particularly when dealing with values and value conflicts. Finally, discourse ethics has been viewed as relevant for IS research (e.g., Yetim, 2006; Mingers and Walsham, 2010), even though it has not explicitly been related to VSD. Thus, this paper tries to close the gap in the current research on VSD and considers discourse ethics as a theoretical lens for critically analyzing the current practice and as an ideal standard toward which the VSD methodology may strive.

This work is inspired by Hirschheim and Klein's (1994) work which employs neohumanist/emancipatory ideals for analyzing the ETHICS methodology (Mumford, 1983) and proposes improvements for overcoming its limitations. This paper broadens this critical perspective with discourse ethical criteria and contributes to the current research in the following ways: First, as a result of the critical analysis of the status quo in VSD, it identifies some gaps. These mainly concern the lack of explicit methods for supporting deliberative and legitimate decision making with respect to many concerns, including the identification of stakeholders, the legitimation of common design communication, the justification of trade-offs and/or a common regulation in case of competing or incommensurable values as well as the deliberativeness of other design decisions such as the selection of design goals and means. Second, this paper suggests ways for bridging these gaps to some extent by drawing on the knowledge base of critical research in the IS field. In particular, the suggestions concern the inclusion of a practical method for boundary critique and different types of discourses and principles as well as discourse support methods and tools for structuring participation in a way that allows participants to deal with the plurality of values, norms, goals and means deliberatively. Moreover, as many pieces of research on VSD are actually pieces of design science research, i.e. inventing or developing new

(and generically applicable) methods for doing value sensitive design, the addition of discourse ethical criteria into the VSD methodology can be viewed also as a contribution to this research paradigm.

The organization of this paper is as follows: First, the main characteristics of the VSD methodology, including its critiques, are briefly summarized. Next, the perspective of discourse ethics is introduced, and then, the VSD methodology is critically analyzed by drawing on discourse ethics. In addition, some suggestions are provided to move the VSD methodology forward, a VSD case is revisited to discuss how suggested concepts can be applied in practice, and finally, some conclusions are drawn.

## VSD METHODOLOGY

VSD is based on the assumption that technologies have strong ethical and value implications and that the design of technology should proactively be influenced to take account of human values in the design process, rather than merely reacting to them after completion. Accordingly, Friedman et al. (2006b) defined VSD as an “approach to the design of technology that accounts for human values in a principled and comprehensive manner throughout the design process” (p. 349). VSD employs a tripartite methodology consisting of conceptual, empirical, and technical investigations, which are applied iteratively.

*Conceptual investigations* comprise philosophically informed analyses of the central constructs and issues under investigation. For example, how does the philosophical literature conceptualize certain values (e.g. trust, privacy, informed consent)? Who are the direct and indirect stakeholders affected by the design at hand? How should we engage in trade-offs among competing values in the design, implementation, and use of information systems (e.g. autonomy vs. security or anonymity vs. trust)? VSD takes up such questions under the rubric of conceptual investigations.

*Empirical investigations* focus on the human response to the technical artifact, and on the larger social context in which the technology is situated. For example, how do stakeholders apprehend individual values in the interactive context? How do they prioritize competing values in design trade-offs? How do organizations appropriate value considerations in the design process (e.g., what are the organizations’ motivations, methods of training and dissemination, and reward structures)?

*Technical investigations* can focus on the design of systems as well as on the analysis of the properties of existing technology. In the first form, they deal with the proactive design of systems to support values identified in the conceptual investigation. In the second form, they involve a retrospective analysis of how existing technological properties and underlying mechanisms support or hinder human values. Friedman et al. (2006b) also note that with respect to the second form, technical investigations may also involve empirical activities, yet they focus on the technology itself and not on people.

Friedman et al. (2006b) also provide some guidelines for practicing VSD, suggesting: (1) to start with a value, technology, or context of use; (2) to identify direct and indirect stakeholders; (3) to identify harms and benefits for each stakeholder group; (4) to map harms and benefits onto corresponding values; (5) to conduct a conceptual investigation of key values; (6) to identify potential value conflicts; and (7) to integrate value considerations into one’s organizational structure. In addition, they suggest heuristics for both interviewing stakeholders and technical investigations.

As for methods for conducting these VSD activities, Friedman et al. (2006b) suggest considering a multiple methods approach, e.g., using both qualitative and quantitative research from the empirical sciences to understand the values and views of individuals, groups and organizations, and employing available design methods to deal with technical issues. In addition, two techniques have been suggested that are specific to VSD. *Value scenarios* (Nathan et al., 2007) are one VSD technique, which help with envisioning systemic effects of potential technical solutions. This method involves writing stories about how people use a technology, focusing attention on the effects on direct and indirect stakeholders, value tensions, unusual uses, and longer-term societal implications. *Value dams and flows* (Miller et al., 2007, Denning et al., 2010) are another VSD technique, which help identify reasonable value-sensitive design solutions among a range of possible designs and technical features by considering value tensions. With this technique, options that are disliked by a threshold percentage of stakeholders are removed from the design space (dams); then within the remaining design space, options that are liked by many stakeholders are identified as good candidates for the design solution (flows).

To date, VSD has been applied in a wide range of research and design contexts. For example, the web browser case study (Millett et al., 2001; Friedman et al., 2002, 2005) began with a conceptual investigation of the value of informed consent by drawing on diverse literature. With a conceptualization of *informed consent* in hand, they conducted a retrospective analysis of existing technical mechanisms, such as the cookies and web-browser technologies, and redesigned the browser. In another case dealing with the design of the simulation software UrbanSim for supporting urban planning, Borning et al. (2005) started with conceptual investigations and distinguished between moral values

such as fairness, accountability, and democracy, as well as stakeholder values such as environmental sustainability and walkable neighborhoods. As part of supporting the democratic process, they decided that the model should allow different stakeholders to articulate the values most important to them, and evaluate the alternatives in light of these values. They implemented a web-based interface that groups indicators into value categories and allows stakeholders to select indicators related to their values and to evaluate alternative urban futures (Friedman et al., 2008). Other case studies have explored different sets of values and illustrated different ways to employ the VSD methodology, concerning privacy in public (Friedman et al., 2006a), values in Groupware systems (Miller et al., 2007), safety through mobile phone parenting technologies (Czeskis et al., 2010), and the quality of life through implantable medical devices (Denning et al., 2010).

In addition, the VSD methodology has been acknowledged and employed by other researchers who have examined several issues from a VSD perspective, including privacy design (Xu et al., 2008), the analysis of and designing for motivation in the context of Wikipedia (Kuznetsov, 2006), in semantic web applications (Yetim et al., 2011b), and some general discussions on ethics in design through VSD (Cummings, 2006; Manders-Huits and Van den Hoven, 2009).

However, the VSD methodology has also been criticized within the field of Human-Computer Interaction. For example, Le Dantec et al. (2009) argue that *“the VSD methodology does not prescribe a unique perspective on the design process (which is largely left open ended)”* and find in particular three problems associated with it. The first problem concerns the list of “values of ethical import” established within VSD as a heuristic to determine which values to consider within a value-sensitive design. The critique is that the values used in several applications of the VSD methodology to inform design are based on classification, and not informed by the situated context of design. They state that:

*“... rather than acting as a methodology for responding to contextual values, VSD has been operationalized as a methodology for refining system design around a set of preconceived values, promulgating an agenda of design on a largely fixed classification of values, rather than inquiring about the values present in a given context and responding to those values—being sensitive to those values—through design”* (p. 1143).

The second critique is that the VSD methodology “provides no guidance on – in fact, explicitly leaves completely open the question of – which empirical instruments are effective or appropriate for engaging a particular context of use in questions of value” (Le Dantec et al., 2009, p. 1141).

The third critique claims that by focusing on values of ethical import, the VSD methodology privileges known values over value discovery. As the methodology emphasizes the investigation of values in the conceptual phase, “the empirical investigations serve to refine design against a conceptual framing based on known values (the values of ethical import) rather than enabling a process of *discovery and engagement*” (p. 1142).

According to Le Dantec et al. (2009), “what is needed is *more* prescription in methods that inform value-centered investigations, and *less* prescription in the kinds of values considered” (p. 1142). They argue for a commitment to local engagement and discovery of the values present, hence for the re-ordering of the priorities and the investigations defined by the VSD methodology. Empirical investigations with greater focus on discovery and exploration need to come at the beginning of the investigation. They present three case studies that use photo-elicitation techniques to understand values in context.

To sum up, we think that Friedman and colleagues take the credit for offering a viable approach to systematically considering human values throughout the design and deployment of information technology. The diversity of applications demonstrates that the VSD methodology is mature enough as a body of design knowledge and practice to be considered for a critical analysis. Its critique points to some gaps and provide valuable contributions for advancing it. Yet, regarding the critiques on the use of a set of preconceived values which are derived from the published literature, we should note that Friedman et al. (2006b) consider them incomplete. In addition, concerning the sequence of investigations, even though some cases start with conceptual investigations first (e.g., Borning et al., 2005), they emphasize that the design process can begin from any of the investigation types. For example, Friedman et al. (2006a) began with an empirical investigation of a large display installation whereas Miller et al. (2007) began with the technical investigation of a groupware system. Seeing how, on the other hand, the current VSD methodology does not prescribe a unique perspective on the design process, we see an opportunity and space for its advancement toward a specific direction or perspective. Moreover, we think that any “prescription in methods that inform value sensitive design” or suggestion for what one should do in case of value conflicts requires an explicit ethical theory that justifies the recommended actions or prescriptions. In our view neither the VSD literature nor the associated critique makes explicit and transparent which ethical theory underlies the choices of values in case of conflicts. This paper aims to fill this gap by suggesting discourse ethics as an explicit ethical theory for VSD. We next introduce relevant aspects of discourse ethics in order to reexamine the current VSD practice from this perspective and to suggest ways to move the VSD methodology forwards.

## DISCOURSE ETHICS

Habermas (1990, 1993) developed his discourse ethics out of his theory of communicative action (Habermas 1984) to clarify the normative basis of human action, communication, and interaction. According to Habermas, for pluralistic societies which no longer have a single, overarching moral authority, a formal moral theory such as discourse ethics is needed to create the 'free spaces' necessary for a pluralism of many different 'good lives.' Habermas differentiates strictly between 'questions of the good life' (i.e., ethical questions) and 'questions of justice' (i.e., moral questions), accordingly, between 'values' and 'norms.' Discourse ethics does not provide the right norm that regulates between a diversity of value orientations; rather, it provides a procedure to find the norm. For this purpose, Habermas reformulates the fundamental insights of Kantian deontological ethics; his position is that the validity of a moral norm cannot be justified in the mind of an isolated individual, as required by Kant's categorical imperative (i.e., a person decides whether she or he wishes everyone else to act according to the same maxim). Instead, the justification of norms requires the involvement of all those affected in a process of argumentation to test norms dialogically. This is expressed by the so-called *discourse principle* which states that "only those norms can claim to be valid that meet (or could meet) with the approval of all affected in their capacity as *participants in a practical discourse*" (Habermas, 1990, p. 66).

In several works, Habermas (1984, 1993, 1996) developed a complex discourse architecture to deal with different types of issues discursively. Not all of them are directly related to discourse ethics, yet they are all relevant for promoting a deliberative VSD practice and will be explained later. With respect to the concerns of discourse ethics, Habermas (1993, 1996) distinguishes between three types of issues (i.e., pragmatic, ethical, and moral issues), and related discourses for dealing with them deliberatively, which is viewed as the major strength of discourse ethics (Mingers and Walsham, 2010). In addition, Habermas (1993, 1999) suggests two moral principles for seeking justice in case of value, norm or action conflicts. To clarify the contribution of discourse ethics to VSD, these concepts should be explained briefly.

### Pragmatic, Ethical and Moral Issues

According to Habermas (1993), the traditional ethical question "what should we do?" can occur with respect to three different kinds of problematic situations: pragmatic, ethical and moral, and thus take on a pragmatic, an ethical, or a moral meaning. Although in each case it is a matter of justifying choices among alternative available courses of action, each of them calls for different kinds of answers. In the pragmatic domain, the question calls for finding an appropriate means to a well-defined goal or purpose. In the context of system development, pragmatic issues are those such as: What should we do to develop a system in an efficient way? And how should we design the user interface? The questions may be quite complex and are mainly related to solving problems in the material world.

Ethical questions enter when uncertainty or disagreement about appropriate objectives and goals occur. The question "what should I (we) do?" calls for finding out what is good for me (us). Ethical issues deal with strong values (Taylor, 1989) and the self-understanding of a person or a community. In the context of system development, ethical issues include those such as: Should I (we) be concerned about the effects of systems on my (our) privacy? Should I (we) care about the transparency of the system?

Moral issues occur in the case of conflicting interests and value orientations. The issue of "what should we do?" calls for finding a generally valid answer that transcends the interests of particular groups and is equally good for all, and thus just. Action-related conflicts can be resolved with reference to a norm that is believed to be right, i.e., equally in the interest of all potentially affected. In system development, moral issues may include questions like: What should we do to establish a development process or to design a system that is just or good for all? What is the just regulation in case of tensions between privacy and security? Examples of norms might be the right to exercise basic freedom to suggest design options or the right to be not treated in a racist way in the design process and by the designed system.

### Deliberation in Practical Discourses

For Habermas, the answers to these issues (what is purposive, good or right) may be different for different people or groups. In relation to the three issues, Habermas (1993) suggests three types of practical discourses to deal with conflicting views deliberatively. Pragmatic discourse is entered when dealing with conflicts concerning the choice of means in order to achieve the given end effectively. It can also involve the rational choice of goals to realize a given value. Stakeholders can discuss and rationally justify the choices of the means (e.g., technical design options) to achieve the goals agreed upon or weighing the goals in the light of accepted value preference.

Ethical discourse is entered when orienting values themselves become problematic. It involves important value decisions which have a relative validity since the question of what is “good” or “bad” for certain stakeholders is always defined in terms of the specific identity and life history of the person or the group. Moral discourse is entered to find out the regulation/norm that is equally good for all, which requires generalization across conflicting societal or cultural interests and value orientations.

In these discourses, stakeholders can dialogically examine their assumptions, interests and values in the light of all other relevant claims and reasons and transcend whatever their initial preferences may have been. In this process there is an implied hierarchy, i.e., ethical reasons win out over pragmatic reasons, and moral reasons win out over ethical reasons.

### Moral Principles for Finding the Just Norm

Moral questions dealing with justice are the main concern of discourse ethics. The discourse principle introduced earlier suggests that valid norms must be approved by all those affected, and that this must occur through an actual debate. However, it does not specify what should be considered in such a debate. Two moral principles provide orientation in moral discourses to find out what is just for all: the *universalization principle* for arriving at justified norms and the *appropriateness principle* for the application of justified norms. The universalization principle states that “A norm is valid when the foreseeable consequences and side-effects of its general observance for the interests and value-orientations of each individual could be jointly accepted by all concerned without coercion” (Habermas, 1999, p. 42). This principle emphasizes that moral norms should be universalizable in the sense of giving equal consideration to everybody’s interests and values. Participants should take the perspective of others, reflect on the possible consequences of a suggested norm, and try to generate a common will, that is, become convinced based on arguments that the norm represents the best way for all to resolve their differences.

Yet, Habermas acknowledges that moral discourses cannot take into account *ex ante* all possible constellations of future situations when justifying a norm from the perspective of universalizability. Thus a norm does not yet guarantee justice in all future cases. Therefore, the principle of appropriateness requires an argumentative clarification of the appropriateness of norms in the application context in its own right, to address the question of context-sensitivity by considering all relevant features of the situation (Habermas, 1993). In other words, the universalization and appropriateness principles express different aspects of the same moral principle, which requires that the interests and value orientation of each person be given equal consideration.

In system development, both principles can be applied for dealing with conflicts. The appropriateness principle applies when multiple valid norms are present to resolve a conflict. Participants need to decide which of them is appropriate in the concrete case. The universalization principle applies when a commonly accepted norm does not exist which requires participants to identify/construct such a norm to regulate their action conflicts.

Before closing this subsection, we should also note: First, practical decisions are considered legitimate if they result from a deliberative process that involves a fair consideration of the interests, values and valid norms and accepts/rejects points of view solely on the basis of the forces of better arguments. Second, in order to be considered as rational, the discourse process must meet the condition of an “ideal speech situation,” including freedom from coercion, unlimited time, and the availability of all relevant information. Third, an idealized discourse is often counterfactual to realistic situations, and consequently can only exist in its pure form in principle. Therefore, in accordance with Habermas (1996), we consider discourse ethics as a regulative idea that does not call for full compliance with all demanded aspects and the best we can achieve are partial justifications. Next, we use the ideals as critical standards to analyze the VSD methodology and its current practice.

## VALUE SENSITIVE DESIGN RECONSIDERED

From the brief introduction of the discourse ethics, at least the following requirements for a system development methodology such as the VSD methodology can be drawn. First of all, the discourse principle suggests the inclusion of all those affected in discourse, which in turn requires a method to identify them. In addition, Habermas suggests separation between types of issues in order to treat them appropriately according to their logic. Moreover, dialog and reflection are the preferred methods to address these issues (including reflecting on one’s own values). Finally, discourse ethics requires the consideration of moral principles for resolving conflicts in a fair or just way. In light of these standards, we revisit the VSD methodology and its current practice to understand whether they (1) identify relevant stakeholders (and how), (2) distinguish between pragmatic, ethical and moral issues, (3) provide opportunities for critical reflections on values, and (4) deal with issues of justice in cases of value conflicts.

Regarding the data used and the method employed for the critical analysis, we should note that the published works mentioned before in the description of the VSD methodology have served as a data base for the analysis. Hence, the

results rely on the information/evidence available in these publications. Some publications have described the VSD methodology in theory, while others have dealt with case studies showing how the methodology has been utilized in practice. In this analysis, both types of works are considered and interpreted. Indeed, multiple readings and interpretations of a text can be generated. Having in mind the criteria of discourse ethics, the author reviewed the published works focusing on the texts and searching for evidence for these criteria. This method can be regarded as similar to the method employed by Beath and Orlikowski (1994), in the sense that the analysis draws on text in its own right, as distinct from a strategy for challenging its authors, for closely examining the content of the VSD methodology. The critical analysis has revealed the following results.

### Does the VSD methodology identify relevant stakeholders, and how?

A key aspect of the VSD methodology is its focus on both direct and indirect stakeholders, i.e. considering those who use the system directly and those who do not use the system directly, but who are affected by it (Friedman et al., 2006b). Several case studies have mentioned the class of direct and indirect stakeholders. For example, in case of UrbanSim (Borning et al., 2005), the urban modelers and technical planners were mentioned as direct stakeholders, whereas the indirect stakeholders included all the residents of the region being modeled, as well as residents of nearby regions. A more recent case study dealing with mobile phone parenting safety technologies (Czeskis et al., 2010), considered “the teens and their parents who use the mobile phone safety applications as direct stakeholders” and “the teen’s friends and their parents as one important group of indirect stakeholders” (p. 3). However, the overview of the methodology provided by Friedman et al. (2006b) did not prescribe any method for identifying relevant stakeholders, nor did the case studies make explicit which method was used for identifying the stakeholders.

### Does the VSD methodology distinguish between pragmatic, ethical and moral issues?

The analysis of all VSD cases reveals that the VSD methodology clearly distinguishes pragmatic issues from value-related issues, but it does not differentiate between ethical and moral values. Friedman et al. (2006b) use a broader meaning of the term “value” wherein “a value refers to what a person or a group of people considers important in life” (p. 349) and also distinguishes between moral and non-moral values. They use ethical and moral values synonymously and refer to them as “human values with ethical import” or “values with moral import” (p. 360). Examples of such values include human welfare, privacy, freedom from bias, universal usability, trust, autonomy, informed consent, accountability, etc. These values serve to ground the development of systems and “have moral epistemic standing independent of whether a particular person or a group upholds such values” (Friedman and Kahn, 2003, p. 1186).

In contrast, Habermas (1996) clearly distinguishes moral norms from cultural values and questions of justice from questions of good life. He states that “the terminological distinction between norms and values loses its validity only in those theories that claim universal validity for the highest values or goods, as in the classical versions of the ethics of the good. These ontological approaches reify goods and values into entities existing in themselves. Under the conditions of value pluralism this moral realism scarcely seems defensible” (p. 256).

Hence, taking into account the particularity of values, the flexibility of value hierarchies, and the local character of value configurations, one may argue (as did the previous critiques of the VSD methodology) that “VSD projects itself within the nimbus of morality, cultivating a dogmatic response with respect to which values are worthy of consideration and disengaging from a commitment to understanding the nuanced manifestation of a plurality of values” (Le Dantec et al., 2009, p. 1142). Yet, from the perspective of discourse ethics, understanding or discovering values present in the local context is not sufficient. Rather, a VSD methodology needs also to provide a discursive mechanism to deal with the plurality of values deliberatively while searching for the “good for all” solution, since the moral norms that regulate the common life among subjects are not simply discovered, but partly constructed at the same time (Habermas, 1996).

### Does the VSD methodology facilitate critical reflections on values, and when?

In order to analyze the opportunities for reflection on values within VSD, we distinguish between the development process, the artifact, and the application context. Accordingly, stakeholders may reflect on:

- values/norms underlying the development process during its planning,
- values/norms to be embedded in the artifact within its development process,
- values/norms embedded in the artifact during its use within the application context, and
- values/norms present in the application context.

The analysis of the related literature reveals: First, in all cases there is no explicit attention to the values underlying the development process and thus no reflections on what values or norms should serve as the basis of the



development process. In contrast, empirical works confirm that differences in communication values and conventions may have an influence on the outcome of the design process (Te'eni, 2001). In addition, there is also the concern of the legitimacy of the design process (Yetim, 2006). In fact, Borning et al. (2005) regarded legitimation as a key value in the urban planning case, yet the VSD methodology does not explicitly consider values and the legitimacy of the design process itself.

Second, the VSD methodology encourages the involvement of stakeholders and considers their views in design process. Formative evaluations provide opportunities for feedback in the design process, which guides the redesign of the system (Borning et al., 2005). However, these reflections are limited to some extent and do not include reflections on values of ethical importance to be embedded in the system. This is partly due to the fact that the ethical values are analyzed and attended to by the design team within the conceptual investigations.

Third, the analysis of the urban planning case (Borning et al., 2005) – a case which valued public deliberation and legitimation by referring to Habermas (1984) – revealed that it primarily supported reflections on the stakeholder values after the deployment of the system. This case presented UrbanSim as the output of VSD, and the system was designed to inform public deliberation and debate around major decisions regarding land use and transportation. The case differentiated between moral values explicitly embedded in the system and stakeholder values. The key moral values supporting democratic planning and legitimation as well as stakeholder values such as walkable neighborhoods are relevant for and related to the context of urban planning. Comprehensibility, accuracy, transparency, relevance, and freedom from bias were viewed as instrumental values to the legitimation and were therefore embedded in the designed artifact. In addition, the design of the indicator browser aimed to support the legitimation through increased access to and transparency of the indicators.

Here the key point is: If we take the design of the UrbanSim and its Browser as an example for the application of the VSD methodology, then the methods explicitly enabling reflections in the design process are mainly limited to the formative evaluations. In this case, the VSD does not deal with the explicitly supported ethical values in a reflective way in the design process, and reflections on stakeholder values do not much inform the value sensitive design of the artifact itself. Rather, stakeholder values are considered in the system to support deliberation within the urban planning process, in which the stakeholders can use the interface to select indicators that speak to values that are important to them. Hence, only if we reframe the case and regard urban plan as the output of VSD (like Le Dantec et al., 2009) will this case come to represent a good example of a deliberative VSD, where UrbanSim becomes a tool for the design process of the urban plan and enables the exposure of and deliberation upon values expressed in the urban plan. Similarly, the case establishing a live video feed of a public space creates an opportunity for reflecting on values within the application context (Friedman et al., 2006a).

In contrast, the case dealing with the development of the groupware system (Miller et al., 2007) collected the values and views of the stakeholders through a survey within the design process, yet, the participation in the design process remained restricted as the participatory design method was not valued for this industrial project by the management of the organizations.

In summary, the current practice of VSD pays less explicit attention to – and the methodology neither prescribes nor rules out the employment of – deliberative methods and tools to critically reflect on values *within the development process*.

### Does the VSD methodology seek justice in case of value conflicts?

Discourse ethics accepts that ethical questions may not generate universal, but only local agreement and yet they can still be the subject of rational discourse. Moral issues emerge with the need for regulations among diverse (and often conflicting) values and the universalization principle requires that the stakeholders consider the interests and value orientations of those affected in moral discourses and reflect on the consequences of a suggested norm.

The universalization principle relates directly to the VSD's concerns about how to involve the direct and indirect stakeholders. In the case of urban planning, Borning et al. (2005) stated that UrbanSim was designed "to help stakeholders understand the long term consequences of different choices" (p. 1). As argued before, this refers to the decision making process in the context of urban planning, which can only be regarded as an approximation of the universalization principle in the process of VSD if we reframe the case and consider the urban plan as the output of the VSD. Then, it becomes a good example of illustrating how to design a legitimate plan by considering values and conflicts and finding the just regulations. In contrast, the design process of UrbanSim itself does not include an explicit method that allows participants to discursively anticipate the consequences of their choices of means and values to be embedded in the system.

In another case dealing with the development of groupware systems (Miller et al., 2007), explicit attention was paid to the consequences of the design choices to the values of stakeholders. The study collected feedback from the stakeholders about their perceptions of the benefits and harms that could result from the design features. They applied the "value dams and flows" technique to make decisions about technical features and to deal with value

tensions, for example, balancing between privacy needs and awareness. Value dams refer to features that are strongly opposed by even a small set of stakeholders, whereas value flows refer to features that, for value reasons, a large percentage of stakeholders would like to see in the system. Miller et al. (2007) reported as follows:

*“.. when considering potential privacy-related harms, logging both searches and queries arose as value dams in our survey with 11% or more of respondents strongly agreeing that each of these compromised their privacy. When considering awareness-related potential benefits of the system, a solid majority of participants agreed or strongly agreed that they would like the system to report how often their contributions are used (76%) and how their peers ranked their posts (65%), making these two features value flows. [...] Thus, to mitigate the privacy-related value dams while still taking advantage of the awareness-related value flows, we determined not to log or report who searches or queries, but to log and report frequency of code use and implement content ranking” (p. 285).*

They also claim to take an ethical perspective by considering value dams – “it is good practice to consider the rights and harms of persons in the minority” (p. 284). However, despite the usefulness of the method as a pragmatic solution, it raises several issues. For example, concerning the boundaries: who determines the threshold percentage for value dams and how is the decision made? In addition, concerning the informativeness of decisions: What if the participants’ understanding of values such as privacy differs and/or their knowledge of technical features is mistaken or insufficient to make a reliable decision about the consequences? Moreover, concerning the opportunities offered to find a just regulation: Why not discuss and explore alternative options for satisfying diverse interests and value orientation before deciding to exclude some design options by classifying them as value dams? For example, one may assess whether designing for diversity and creating different versions may be viewed as good for all or not. In other words, all these normative decisions require justification and thus an explicit ethical theory. The weakness of the value dams and flows technique is that it does not explicitly promote dialogical reflections among stakeholders so they may inform each other about their reasons or arguments for their choices and promote learning. Instead, each stakeholder individually forms his or her own will and expresses it in interviews. This applies also to the case dealing with mobile phone parenting safety technologies (Czeskis et al., 2010).

In summary, the critical analysis with respect to the issue of justice reveals that the VSD methodology explicitly recommends addressing value tensions among the stakeholders, yet the methods employed thus far do not involve dialogical reflections in the design process, nor does the methodology prescribe it. In contrast, the communicative achievement of agreements presupposes reflexivity, i.e., the critical examination of one’s values, assumptions, and interests in light of all other relevant claims and reasons, allowing stakeholders to question and transcend whatever their initial preferences may have been (Hirschheim and Klein, 1994). Hence, the discourse ethics provides an alternative way that emphasizes deliberating on normative issues, reflecting on the consequences of suggestions in argumentative discourse, and discussing alternative ways in seeking a fair regulation for all.

Before closing this section, the following conclusion can be drawn from the results of the analysis of different aspects of VSD. The results show that the critical moment in VSD is passed at the moment of planning, including the design of design process and the choice of the values and methods considered within the design process. The analysis also reveals that the VSD methodology does not suggest a particular method for identifying stakeholders, nor is it explicitly concerned with methods for addressing pragmatic, ethical and moral issues deliberatively in a design process. Moreover, it lacks an explicit ethical theory that might provide orientation for what should be done to find a just regulation in the case of value tensions. Nevertheless, the VSD methodology is in principle open for other methods, including those that may promote a more deliberative inquiry within the VSD processes, not only with respect to values and norms, but also with respect to pragmatic issues such as the identification of design goals and means to achieve them.

## MOVING VSD FORWARD

So far we have reflected on the current practice of VSD by considering the ideal communicative framework of discourse ethics. In line with Habermas, we acknowledged the difficulties in achieving full compliance with the ideal standards in practice, yet we see opportunities for pragmatization of discourse ethics in the IS field (Yetim, 2006; Mingers and Walsham, 2010). In this section we will reflect on some major challenges and provide some suggestions on how to address them by employing ideas from the field of critical research and other research fields. The suggestions include facilitating a boundary critique, continuous discourse and participation, and finally, the iteration between pragmatic ethical and moral discourses. The methods suggested for addressing each of these issues can help to deal with some of the gaps in the VSD methodology. The choice and integration of particular methods/tools rests upon the simple logic that they are either developed based on discourse-theoretical and/or discourse-ethical concepts or are consistent with them, i.e., that they value the inclusion of those affected and provide structural features needed for practicing a discourse.

## Facilitating Boundary Critique

A key aspect of the VSD methodology is its focus on direct and indirect stakeholders, which relates to the concern of the discourse ethics. Although there are methods for involving stakeholders, ordinary citizens, or their representatives (e.g., focus groups, public forums, online discussion groups, and open calls for participation), there still remains the difficulty of determining where to cut off ever-broadening circles of involvement in the public discourse: the local community, the country or the whole world? For example, a web-based system designed for one culture or society can also be used by other cultures. Should other cultures articulate their interests and value orientations, and if so, how? When tensions between values of stakeholders emerge, whose values take precedence? Even though we carefully consider as many aspects of the situation as possible, the problem is always: Where do you stop? At some point, an exclusionary judgment must be made about who should participate in any particular discussion for the desired discussion to occur, and/or what values should be the focus.

Critical researchers advocate reflecting on boundary judgments, i.e., analyzing, evaluating and challenging the rightness of boundary assumptions, before making a final decision (e.g., Ulrich, 2000; Cordoba and Midgley, 2008). Boundary judgments define the boundaries in two interdependent ways: First, they delimit the reference system by defining what counts as relevant knowledge and whose concerns are to be considered as part of the problem. Likewise, since both knowledge and concerns always represent somebody's facts and values, boundary judgments also define the group of people who are (or should be) involved in a project (Ulrich and Reynolds, 2010). For supporting the boundary critique, Ulrich (2000) developed critical heuristics based on the work of Churchman (1979) and Habermas (1984). The heuristics help to challenge the boundary judgments that are often made by experts or those in power against the interests of those who are affected but powerless. There are four basic boundary issues that ask for the basis of motivation, of power, of knowledge, and of legitimation (Table 1). Each of the four issues is then further structured into three boundary categories. The first category of each issue refers to social roles of actors concerned (i.e., client, decision maker, professional, witness); the second to role-specific core concerns (i.e., purpose, resource, expertise, emancipation); and the third to key problems in reconciling clashes between such concerns (i.e., measure of improvement, decision environment, guarantor of success, worldview). Taken together, these 12 boundary categories or the related boundary judgments define the selectivity of the reference system at work.

**Table 1: Checklist of Critically Heuristic Boundary Questions (Ulrich, 2000, p. 12).**

<p><b>Sources of Motivation</b></p> <ul style="list-style-type: none"> <li>• Who is (ought to be) the <b>client</b>?</li> <li>• What is (ought to be) the <b>purpose</b>?</li> <li>• What is (ought to be) the <b>measure of improvement</b>?</li> </ul>
<p><b>Sources of Power</b></p> <ul style="list-style-type: none"> <li>• Who is (ought to be) the <b>decision-maker</b>?</li> <li>• What <b>resources</b> are (ought to be) controlled by the decision-maker?</li> <li>• What conditions are (ought to be) part of the <b>decision environment</b>?</li> </ul>
<p><b>Sources of Knowledge</b></p> <ul style="list-style-type: none"> <li>• Who is (ought to be) considered a <b>professional</b>?</li> <li>• What <b>expertise</b> is (ought to be) consulted?</li> <li>• What or who is (ought to be) assumed to be the <b>guarantor of success</b>?</li> </ul>
<p><b>Sources of Legitimation</b></p> <ul style="list-style-type: none"> <li>• Who is (ought to be) witness to the interests of those affected but not involved?</li> <li>• What secures (ought to secure) the <b>emancipation</b> of those affected from the premises and promises of those involved?</li> <li>• What <b>worldview</b> is (ought to be) determining?</li> </ul>

The 12 questions can be answered in both prescriptive (ought) and descriptive (is) mode. Differences between answers to "what should ideally be the case?" and "what is actually the case?" point to unresolved boundary issues. Within each mode, the questions should be used iteratively since their answers are interdependent. Likewise, moving back and forth between 'ought' and 'is' answers may drive the process of revision.

There are also other approaches that suggest a complementary set of questions for critically exercising boundaries for IS planning, exploring who and what is included, how certain concerns come to be privileged at the expense of others, etc. (e.g., Cordoba and Midgley, 2008). Leaving aside the differences between these works, they endorse the perspective that all these questions aim to reveal the partiality of the judgments about what concerns, facts or values are relevant to the design and who should be involved in dealing with them. This forces those in power to justify their boundary judgments and ultimately, perhaps, to change them (Ulrich, 2000).

The set of boundary questions can in principle be applied in both an extra-discursive and a discursive way to reflect on many issues that come up in a VSD project. They may be used for analyzing and evaluating the process and

outcome of VSD in specific contexts. For example, one may evaluate participatory planning in the UrbanSim case to reveal the limitations of the project with regard to its claim of being inclusive, or to prompt a critical awareness of what interests were given prominence and which were marginalized. The real value of the questions lies, however, in their dialogical use within the VSD framework, as yet another method to guide the identification of relevant stakeholders and the reflection on the boundaries of the reference system. A dialogical component may also be realized after formal interviews in the form of an informal engagement of stakeholders.

The analysis of the VSD methodology and its applications has shown that the methodology is concerned with involving direct and indirect stakeholders, yet it does not provide suggestions on how to critically select stakeholders. Thus, this method would complement the methods of VSD by making boundary dimensions explicit and by adding the missing dimension of critically-discursive tools for reflecting on them in a systematic way. It can not only help with identifying relevant stakeholders, but also with critically reflecting on any methods to be employed in a VSD project. Different methods make different theoretical assumptions and define different possibilities for action. For example, a method may be challenged with respect to the underlying worldviews or whether it marginalizes or includes opposing views in debate. The claim that a method is “good” or that it works on behalf of a marginalized community might be viewed as a partial view when examined in the context of other reference systems and when revised after examining the various boundary judgments.

The suggestions may be more practical in some cases, for example, in the UrbanSim case (Borning et al., 2005) that valued participation, and is less practical in the others, for example, in the groupware case (Miller et al., 2007), where participation was constrained by the organization. One way to support the VSD practice is to provide a tool with a list of critical questions that can be used alongside other VSD methods. Experiences from the application of the critical questions in other contexts suggest exploring them in reasonable detail in a single, half-day workshop when there is a limited set of participants or through a series of semi-structured interviews and group workshops when the range of stakeholders is broader (Achterkamp and Vos, 2007; Cordoba and Midgley, 2008; Ulrich and Reynolds, 2010).

Yet, the boundary critique is not a method for determining “right” or “wrong” boundary judgments and for settling conflicts. Rather, the key issue here is that practitioners can be provided with the opportunity to employ these questions in order to reflect critically on the boundaries adopted within a VSD project and to make more informed decisions about the situation at hand. The final decision of whether and on what principal boundary judgments should underpin practical action remains a task of institutionalized processes of decision making. Certainly, the success of the employment of boundary issues depends among other things on whether or not they are constrained, for example, by existing power relations or whether stakeholders are willing to publicly debate on their values and assumptions. Yet, some barriers can be minimized through design that offers features such as anonymity or incentives mechanisms (Zhang, 2008; Cuel et al., 2011) or other ways to expand possibilities for public discourse and participation (Yetim and Turoff, 2004; Preece and Shneiderman, 2009).

## Facilitating Continuous Participation and Discourse

Another challenge concerns the implementation of the moral principles of the discourse ethics within a VSD project, which requires that the decision on what is good and just must be decided by those affected by the technology. It is not only unrealistic to involve all users in the discourse during the design and implementation (Markus and Mao, 2004, Yetim, 2010), but also the interpretations of those involved may change over time. Therefore, considering empirical investigations on values in the beginning of the VSD process, as suggested by Le Dantec et al. (2009) in their critiques of the VSD methodology, is insufficient. The descriptions and empirical understandings are usually placed at a certain time and located in specific social contexts (Myers, 2009). In the rapidly changing world of information technology and human relationships, the insights are likely to be temporary.

If there is no way to get around this problem, the remaining option for considering new stakeholders and unanticipated values is to supplement the design time participation with use time participation in order to facilitate a continuous discourse. Post-implementation participation is viewed as more effective in garnering user interest and assistance (Wagner and Newell, 2007). For this reason, Yetim (2010) suggests meta-communication as a design principle and argues for implementing meta-communication mechanisms in the designed artifact too, in order to enable reflection in both design and use time. In the context of VSD, the meta-communication principle can be implemented in order to facilitate reflection on and negotiate the communication structures and norms (i.e., communicative genres) of the participatory design process, and thus contribute to the enhancement of its legitimacy. In addition, a meta-communication facility within the design process can promote a mutual understanding of communication norms and values and action patterns that are to be embedded in the resultant system. Finally, meta-communication mechanisms implemented as features of the interactive system can facilitate reflections and feedback in use time.

Are there such emerging applications of this principle? In fact, many technologies promote meta-level communications or feedback. Some of them are tools such as Compendium (Conklin, 2005), supporting dialogs in the design process, some others are interface elements (“widgets”) such as icons, buttons, agents, etc. that can be

activated in the use time of a system. Many built-in software features provide an awareness of communication activities or allow readers of a document to email the author and provide evaluative feedback, etc. (Dourish, 1995). A good example of a system with meta-communication facility is Wikipedia, which allows continuous discussion on the forms and contents of its articles (Hansen et al., 2009). As each article communicates its content, the communication about each article can be viewed as a meta-communication. In other words, Wikipedia evolves through its meta-communications. There are also other tools supporting user participation in use time by allowing users to communicate design or usability problems that appear in use contexts (Yetim et al., 2011a).

Among these approaches, the meta-communication model suggested by Yetim (2006) is of particular relevance to the purpose of this paper since it is mainly based on Habermas's (1984,1996) discourse theory, and thus provides those concepts that are needed for structuring and enabling discursive practice from the perspective of this theory. Moreover, the model has been implemented in several tools in different ways, first in the form of templates within the 'Compendium' system for supporting discourse-mapping, and then in the form of discourse functionalities of a system called DISCURSIUM (Yetim, 2008). In these tools, the model provides structures for systematically reflecting on a set of basic issues and potential breakdowns in global communication. In particular, it allows users to reflect on and evaluate the *comprehensibility* of signs at the physical, syntactic, and semantic level, the *relevance* of signs for the current purpose, the *validity* of signs (including their expressive, empirical, and normative validity), and finally, the *rationality* of signs for an effective communication (including their instrumental, strategic, and aesthetic rationality). The model also provides different types of discourses suggested by Habermas (1984, 1996) and relates them to the basic issues in order to structure argumentative discussions on and justifications of potential conflicting views with respect to these basic issues. They include *explicative discourse* for justifying the comprehensibility of signs, *pragmatic discourse* for justifying the relevance (purposefulness) of the choices, *therapeutic critique* for critical examination of the sincerity of expressions, *legal discourse* for justifying the legitimacy of actions/expressions; *theoretical discourse* for explaining/justifying the truth of expressions and the efficacy of actions; *aesthetic critique* for critical examination of aesthetic value standards; *ethical discourse* for justifying actions from a (cultural) value perspective; and *moral discourse* for justifying the universal rightness of norms.

When integrated within the VSD methodology, DISCURSIUM can be used for different purposes. First, as mentioned above, a major weakness of the VSD methodology is the lack of legitimating the design process. If we view systems development communication as an interrelated set of genres (or recurrent patterns) of communication, the tool can be used to communicate about the global differences in communication conventions, forms, and norms, in order to achieve a mutual understanding about the forms and norms of design communication. Yetim (2006) illustrated in detail how this can be done.. Second, it can be used in the design process for critical reflection on information and actions (i.e., signs) to be designed. Finally, when integrated in the interface of an application system, the DISCURSIUM tool would allow users to articulate any breakdowns and/or suggestions related to information and actions provided or enabled by the system during its use.

Moreover, to guide reflections within pragmatic, ethical, and moral discourses, which are of particular relevance here, a set of guiding questions have been proposed for each discourse (Yetim, 2011b), partly based on value-based practical reasoning (Atkinson et al., 2006; Walton et al., 2008). In pragmatic discourse, the questions guide the deliberation on goals in relation to the desired value and the deliberation of actions in relation to both goals and values. Example questions are: How well is goal G supported by (or at least consistent with) the value? Are there other goals that might conflict? Will the action A bring about the desired goal? Are there alternative ways of realizing the same goal? Does doing action A have a side effect which demotes the value intended? In ethical discourse, the questions guide deliberation on values. Example questions are: How is the value V understood/defined? Is value V worth promoting? Are there other values that conflict with value V? Do goals and actions (chosen in pragmatic discourse) promote or violate values preferred? Finally, in moral discourse, the questions guide the deliberation on the rightness of norms and actions. Example questions are: Does a norm or regulation have negative consequences for one's value orientation? Is a diverse regulation good for all (or just)? Are there alternative ways of regulation (norms) that could be good for all given value conflicts? Are the values/goals/actions promoted (in other discourses) in accordance with the accepted norms? All these questions serve as issue-templates not only to guide the deliberation in each discourse, but also to document the results in a structured way. Capturing and communicating the justifications for choices of values, goals, and actions in the development process, as a value-focused design rationale, would promote transparent and rational decision making.

Finally, the critical concepts of the meta-communication model have also been implemented in a guideline management system (GuideMan) to organize design and usability guidelines (Yetim, 2009). For this purpose, the critical issues dealing with comprehensibility, relevance, validity, and rationality of signs are regarded as usability categories or goals. They specify what needs system designers need to satisfy and also make explicit what the guidelines are expected to communicate; namely, recommendations on what should be done to provide readable/perceivable, syntactically and semantically clear signs, to communicate relevant and valid (trustworthy, reliable, appropriate) information, and to act in an efficient and effective way. The tool can support VSD practitioners by providing potential relevant guidelines for considering both the design and evaluation of a system. The discourse-related argument is that both the justification and application of guidelines (i.e., the establishment of a justified

knowledge base for the VSD practice in terms of guidelines and the choice of the appropriate guidelines in design process) can be guided by discourse principles. In practice, the formats and contents of guidelines vary in quality and level of detail, ranging from ill-structured commonsense statements to formalized rules ready for automatic guideline check. However, like any statement or communicative act (Habermas, 1984), guidelines themselves may be subject to criticism and may provoke discussions among designers and researchers as well as between designers, managers, and users, due to possible conflicting differences in expertise, interests, and preferences. To just mention a few: a guideline may be challenged with respect to its comprehensibility because of the jargon or specific words used in the source as coming from various disciplines (e.g., psychology, human factors, ethnography), or with respect to its validity because of the sources (empirical evidence versus personal experience). A guideline may also be contestable in application situations, e.g., when it competes with other guidelines applicable to the same situation (e.g., supporting the same design goal) or allows multiple interpretations of the way it is to be applied. Thus, the construction of a useful and valid set of guidelines as well as the application of the most appropriate ones needs to be justified, balanced, and traded off. Although the system GuideMan does not yet provide a discourse mechanism, discourse on guidelines may be practiced by using any of the discourse support tools mentioned before.

To conclude, all these mechanisms and tools provide features and structures for promoting discourse and continuous participation and offer expanded possibilities for democratic and deliberative actions in different phases of a VSD project. In fact, the VSD methodology advocates stakeholder participation and also argues for designing flexibility into the underlying technical architecture so that it can be responsive to emergent concerns after a system is developed and deployed. For example, in the UrbanSim case, Borning et al. (2005) employed participatory methods and also used agile programming techniques to design an architecture that can more readily accommodate new indicators and models. Yet, they do not offer discursive concepts for structuring and guiding design communication. In addition, changes or adaptations of systems in use time do not only require flexibility at the architectural level, but also (meta-) communication mechanisms in order to allow the stakeholders in use contexts to challenge and negotiate the values that were embedded in a system in design time, and to cooperatively reconfigure the system by, for example, changing value settings or priorities from more security to more freedom or vice versa. Hence, we argue that the inclusion of the suggested discursive concepts, mechanisms and tools in the VSD methodology would enable a deliberative practice in VSD projects. They can be employed in different ways to structure design conversations and can also help to bridge the gap between the design and use time participations and discourses for dealing with emergent concerns. In this way the methodology can better accommodate the moral principles, which require discourses in application contexts too.

### Facilitating Iteration between Pragmatic, Ethical and Moral Discourses

Finally, there is also the practical challenge to cope with the complexity of the pragmatic, ethical and moral issues, i.e., to do justice to their interdependency while addressing them in separate discourses according to the logic of issue. Many VSD cases start with a set of values for ethical import. In contrast, Le Dantec et al. (2009) argue for the re-ordering of priorities and beginning with an investigation of the local values. However, as conflicts with respect to values and technological choices may also be present within local contexts and between local and global contexts, there is a need to systematically address different types of conflicts.

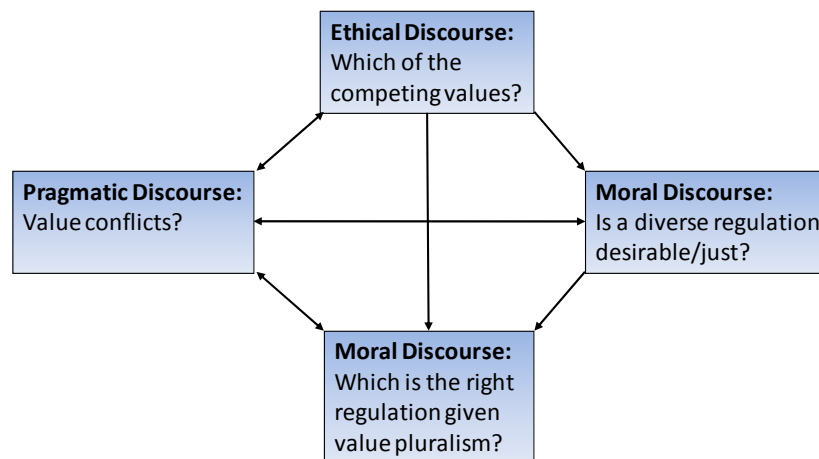


Figure 1: Options for Dealing with Value Conflicts (Yetim, 2006)

To address the conflicts, Yetim (2006) describes how the iteration between the pragmatic, ethical and moral discourses can be conducted. As shown in Figure 1, when participants start with pragmatic issues and deal with design choices, value issues may emerge. For example, while justifying the relevance of a design option participants

may refer to values. Others may question the relevance or purposefulness of the design option by referring to a different value. When such value-related conflicts occur in pragmatic discourses and need to be resolved, participants have, in principle, the following options to continue the debate:

- Reflecting on which of the competing values is good for them and should be taken as a basis for orientation; or
- Clarifying whether constructing some variations of design informed by competing values are acceptable to all; or
- Discussing how a common design should ideally be under the unchangeable condition of the existence of value pluralism.

Thus, participants need to make a procedural decision about which of the three options should first be exploited when value-related conflicts occur in pragmatic discourses. The first option suggests a kind of rational value choice as proposed by Klein and Hirschheim (2001). Conducting rational discourses on competing values in ethical discourses can help to clarify values, yet it does not guarantee a resolution of value conflicts at a global level. Hence, after a value-related discourse actors either agree on a value and thus reenter pragmatic discourse to consider the desired value or may have to pursue the other options to resolve the persistent value conflicts.

The second option suggests a moral discourse on the acceptability of a diverse regulation. Classifying a diverse regulation in moral discourses as permissible means that members of different communities can weigh the merits of that regulation with respect to their values and preferences, e.g., members of a community sharing a value can separately reflect in pragmatic discourse on how they can realize a shared value in their culture-specific prototypes. If diverse orientation is not acceptable, actors can exploit a solution in the sense of a third option.

The third option suggests determining the right solution under conditions of persistent value pluralism. While cooperatively searching for a common regulation, participants suggest solutions, which they regard as good for all and thus just. Participants also express their positions on a suggested regulation by considering its “consequences and side effects” for their interests and value orientations, as required by the universalization principle. Participants may reenter the pragmatic discourse to design in accordance with the accepted regulation.

It is important to point out that ethical and moral discourses can not only be entered to find out the desired value or just regulation, but also to test whether decisions made in pragmatic discourses are in accord with the accepted values and norms. As mentioned earlier, there is an implied ordering in this process, and moral norms have the highest priority. All in all, the iteration between the discourses may not only help in finding commonalities and creating common orientations (or a compromise which integrates different views and values), but may also leave room for diversity (at least partly), where it is morally justifiable.

The separation of pragmatic, ethical and moral issues and deliberation on conflicts in related discourses is insufficiently considered in the VSD methodology. Yet, there is nothing in it to stop the inclusion of all discourses in its investigations (i.e., conceptual, empirical, and technical). There may be different options and related entry points in a VSD project. For example, practitioners may start with empirical and/or conceptual investigations of the values and – depending on the results – organize the most relevant discourse first. In case they have identified a specific value to be considered explicitly, they may first set up a pragmatic discourse to reflect on how to realize the value with design features, whereas in the case of several conflicting values, they may first conduct an ethical (or value) discourse to clarify which of them should be taken as the orientation. When practitioners discuss design goals and means in a pragmatic discourse, they may also list all value tensions that emerged with respect to the goals or chosen means and next set up a value discourse to clarify or prioritize the values to be considered. In the case of persistent value conflicts, practitioners may also arrange a moral or norm discourse to find a common regulation accepted by all those who participated. The list of accepted values and norms can guide the choices of technical mechanisms or design options in a subsequent round of pragmatic discourse.

Finally, it should be noted that in any real-world situation there will be a complex interplay between pragmatic, ethical and moral issues, and probably differing viewpoints about them. For managing the complexity within and between discourses, facilitators may be employed to guide and structure the discussions, for example, using Delphi-like communication structures as discussed by Yetim and Turoff (2004).

## APPLICABILITY OF SUGGESTED CONCEPTS

As a preliminary investigation into the applicability of concepts suggested for extending the VSD methodology, we will next revisit a VSD case and discuss how it may be considered and what changes may result from it. For this purpose,

we have chosen the case of “informed consent” because it deals with the application of the VSD methodology to a globally used real-world software, and thus faces challenges of global diversity.

### Case: Designing Informed Consent for Cookies

This case deals with improving the support of informed consent, a human value, in web-based interactions through the development of technical mechanisms for cookie management (Millet et al., 2001; Friedman et al., 2002, 2005). Technical mechanisms aim at supporting the activities of “informing” and “obtaining consent.” Friedman et al. first explicated six criteria for informed consent in online interactions, which involved disclosure, comprehension, voluntariness, competence, agreement, and minimal distraction. They analyzed current browsers and found that they had fallen short with respect to those criteria. Next they identified four goals for the redesign of the Cookie Manager Tool of the Mozilla browser: (1) enhance the users’ local understanding of specific cookie events; (2) enhance the users’ global understanding of the common uses of cookies technology, including what a cookie is and its potential benefits and risks; (3) enhance the users’ ability to manage cookies; (4) achieve these goals while minimizing distraction for the user. In consideration of the criteria for informed consent and the design goals they implemented two key technical mechanisms for supporting the activities of “informing” and “obtaining consent:” peripheral awareness of cookies, and just-in-time interventions. The peripheral awareness mechanism was realized by implementing a small application called Cookie Watcher which notified users about the occurrence of cookie events. The just-in time interventions were implemented and supported in the Cookie Watcher by allowing users to click on a cookie or on a “Learn About Cookies” button to prompt a Cookie-Information Dialog Box with information about the potential benefits and harms of cookies. The design improvements implemented in the Mozilla browser involved iterations between design, implementation, and small-scale usability studies.

Given this brief overview of the case, we now turn our attention to investigating how boundary questions can be applied in this case for identifying relevant stakeholders, an issue which was not explicitly addressed in this case.

### Facilitating Boundary Critique

Drawing the line between those involved and those not involved is an issue of boundary critique. In this case, the role classifications (i.e., client, decision maker, professional, and witness) can be used to designate roles to participants. In addition, different phases within the project (e.g., conceptual investigations, design, implementation, evaluation) can be considered to decide not only ‘who should be involved’, but also ‘in which phase of the project should this involvement take place.’ The identification of stakeholders requires a moderator and a number of participants who need to understand the project concern, preferably from different angles. Following Achterkamp and Vos (2007), the identification of the stakeholders can be done in four steps. Participants can first define and delimit the project (step 1), then write down individually all of the possible parties involved in the project (step 2). Afterwards, they can, as a group, come up with all the parties who can, will, or ought to fulfill the various roles in the project (step 3). A party may play different roles. In this step, the moderator can open up new directions in the discussion by posing specifically selected guiding questions based on boundary categories. For example, identifying questions concerning the role client could be: What are the benefits of the projects outcomes for the clients mentioned so far? Are there any others who also benefit from these effects? In this step, the boundaries are expanded as participants are encouraged to suggest as many stakeholders as possible. In the final step 4, the participants are expected to indicate which phases of the project the parties identified in step 3 should be involved in. Whereas the former steps lead to the identification of ‘all’ possible stakeholders, the fourth step selects those stakeholders that should actually be involved. In this step, the boundaries are set.

In the case of informed consent, the relevant stakeholders can differ depending on whether the case is conceived as an example of design science research or that of design practice (Hevner et al., 2004). Design research deals with an abstract class of problems (e.g., the development of a VSD methodology), which are relevant to typical classes of stakeholders rather than to particular people or organizations (Venable, 2008). In contrast, design practice deals with a particular, situated problem (e.g., application of the VSD methodology to develop a tool for supporting informed consent), which has particular stakeholders with particular interests in the solution of the problem. One may also think that both research and practice are integrated in this case in the sense of action design research (Sein et al., 2011). Let us briefly reflect on the boundary issues in the ‘ought’ mode. Answering the issues first in the ‘ought’ mode has the advantage that it allows the articulation of hopes and visions, and thus clarifying the normative basis for assessing the answers to the questions in ‘is’ mode (Ulrich and Reynolds, 2010). Yet, we do not intend to set the right boundaries in this case. Interested readers could choose another ‘ought’ position from which to work.

With respect to the motivation basis, the beneficiaries whose interests and values are served need to be clarified. One may consider researchers, developers, organizations, funding agencies, all the current and future users of the web browser in different nations, and thus their governments. They may act in the roles of clients. The key issues for this role are the purpose and the measure of success. The ideal purpose might be the development of the VSD methodology, and the Cookie management tool developed might be seen as instrumental to this goal. Alternatively, the purpose might be the development of the tool for supporting the value of informed consent through the application



of the VSD methodology. The key measure of success in securing some improvement might be centered on some kind of statistics of publications, of the usage of the VSD methodology or of the tools. It can be other kinds of qualitative feedback.

With respect to the power-basis, it is important to make transparent who ought to be in control of the conditions of success or change the system's measures of improvement. Here again, researchers, research funding agencies, reviewers, editors, governments, any members of the public and private institutions etc. may play a decision making role. The key issues for this role are resources and the decision environment, i.e. what conditions of success those involved control and what conditions are beyond their reach.

Concerning the knowledge basis, it is important to understand what expertise is needed to ensure that the system works towards its ideal purpose, who ought to provide such expertise, and how might such expert support prove to be an effective guarantor of success. The entire research community (researchers, reviewers, editors) can have a professional role and can provide appropriate expertise and evaluate the research. In addition, this role can be played by any members of the public or humanity, who can learn about, develop expertise in, and employ (or deploy) the solution technology (Venable, 2008). The guarantee of success might be viewed in the validity of empirical data, in their experience and intuition, in a form of local societal consensus, or in political support on the part of interest groups.

Finally, clarifying the legitimacy basis of the system requires an understanding of what ought to secure the emancipation of those affected indirectly and who should voice their concerns. In fact, the whole humanity may potentially be affected indirectly by the publication and/or application of the VSD methodology. As the affected cannot be identified completely, researchers may possibly act in the role of a witness, perhaps by reading literature, drawing on experience, or even imagining what effects the new solution technology might have on others (Venable, 2008). Governments of different nations may be witnesses for their own public. Ideally, only the affected themselves should determine who is to represent them. Some form of direct participation of the public could be supported by including an advisory board, conducting surveys or (as advocated in this paper) through discussion forums. The main concern of this role is reconciling different worldviews.

Once tentative responses to the boundary questions are found in ought mode, the same questions can be answered in is mode. The comparison of answers to both modes would make the biases concerning boundary judgments transparent and also force critical reflections. For example, participants may become aware that the actual representation of those affected clearly differs from the ideal form of representation, which may initiate further reflections on the validity or acceptability of the boundary judgments.

## Facilitating Continuous Participation and Discourse

As mentioned before, participation of stakeholders can be facilitated in the case of informed consent in different phases of the development process as well as in use time. Stakeholders may first of all establish an agreement on how they would like to organize their communication process within the development process and what tools they may use to support their communication. This is a kind of meta-communication about their communication throughout the project. Then, they may establish different types of discourses in different phases of the project and also use discourse support tools. In the following section, we consider the three types of investigations in VSD (i.e., conceptual, technical and empirical) and discuss briefly how discourse support tools implementing meta-communication concepts can be employed to include a diversity of views within these investigations, i.e., when defining the criteria of informed consent (conceptual investigation), designing (technical investigation) and evaluating (empirical investigation) as well as using the Cookie Manager Tool.

For considering the definitions, let us have a closer look at definitions of some criteria of informed consent, for example, that of disclosure and voluntariness. According to Friedman et al. (2005, p. 499), disclosure "refers to providing accurate information about the benefits and harms that might reasonably be expected from the action under consideration. What is disclosed should address the important values, needs, and interests of the individual, explicitly state the purpose or reason for undertaking the action, and avoid unnecessary technical detail. The information should also disabuse the individual of any commonly held false beliefs." Concerning voluntariness, Friedman et al. (2005, p. 500) emphasize that the actions should not be coerced or overly manipulated. Types of manipulations may involve (a) manipulation of options presented to the individual such that the presentation encourages certain choices or behavior; or (b) psychological manipulations, i.e., influencing a person by causing changes in the individual's mental processes by any means other than reason; or (c) manipulation of information, i.e. using information intentionally to overwhelm the individual or to take advantage of an individual's fear or anxiety.

The content of these definitions dealing with different aspects of information and actions clearly relate to the critical issues of the meta-communication model. Seen from the perspective of global diversity, the critical questions raised concern about not only the definitions of the content of each criteria (i.e., what does disclosure mean? and to whom?)

but also the satisfaction of the criteria-specific requirements for diverse users. That is: Who should decide (and how) what information should be disclosed? What (and whose) values should be taken into account? Hence, by using discourse support tools such as DISCURSIUM, participants can reflect on their understanding and definitions of the criteria of informed consent as well as of their own requirements. Their suggestions may range from how to design to communicate comprehensible, relevant, and valid information to how to enable efficient and effective actions and thereby accommodate diverse ethical values. Differences concerning each of these aspects can be discussed in related discourses. For example, the comprehensibility of definitions of the criteria can be discussed in explicative discourse so that they may construct a common definition easy to understand for all. Similarly, the other issues may become controversial: What information is relevant for the disclosure, what information is valid (i.e., trustworthy, true, normatively appropriate) as well as what information allows efficient and effective communication. The participants may seek for common definitions and requirements or, alternatively, decide to use different regulations for different groups. For example, some groups may anticipate negative consequences of a definition for their interests and values and the participants may regard diverse regulations as just after conducting the moral discourse.

Similarly, participants of design discourse can use the discourse tools to critically reflect on the design goals and strategies/mechanisms for supporting the activities of informing and obtaining consent. For example, participants can set up a pragmatic discourse to identify and justify the selection of goals in relation to the desired value of informed consent (i.e., criteria mentioned) and of the selection of the strategies/mechanisms in relation to both goals and other values. For this purpose, guiding questions would include those such as: Do the goals defined (e.g., enhancing users' local understanding of cookie events or global understanding of the common uses of cookie technology, including its potential benefits and risks) really promote the value of informed consent? Are there mechanisms other than two key mechanisms (i.e., the peripheral awareness of cookies and just-in-time interventions) that may help to achieve the goals efficiently? Do the two mechanisms chosen demote any other values such as trust, privacy, or security? etc. Such questions may promote rational decision making in the design process. Disagreements require a resolution in corresponding discourses. To facilitate different types of discourses with tools such as DISCURSIUM or Compendium, facilitators can create and save reusable issue- or discourse-template structures to seed different kinds of discussions. Documented results of discourses can communicate the justification of decisions, i.e., the choices of values, of goals, and of mechanisms in the design process of informed consent. In addition, the guideline management tool GuideMan can support design discourses by providing design expertise in the form of a guideline, recommending what to do to achieve the design goals agreed upon, i.e., to design comprehensible, relevant, valid information and efficient and effective interaction with the Cookie Manager Tool. As mentioned before, the choices of a guideline for application can also be practiced discursively.

Moreover, discourse support tools can be used to discursively evaluate the interfaces of the prototypes according to criteria ranging from the comprehensibility, relevance, validity, and rationality of both information and action options provided.

Finally, the integration of the DISCURSIUM tool in the browser would offer dialog facilities during the use of the Cookie Manager Tool. For example, the just-in time interventions allow users (by clicking on a "Learn About Cookies" button) to prompt a "Cookie-Information Dialog Box" with information about the potential benefits and harms of cookies. Users may challenge the comprehensibility, relevance, trustworthiness, truth, appropriateness or rightness of the information in their cultural context. For example, users may believe that the information violates legal rules or cultural values (e.g., ownership) not foreseen in design time; or that some information or details are strategically omitted/ misinterpreted/ wrongly placed; or that the tool enforces them to navigate inefficiently, e.g., requiring navigation through several different layers of menu to read the information for being able to signal their agreement to the Terms of Use. This kind of feedback from users can be obtained not only in a one-way communication from users to designers but also in a dialog between users and designers, which would allow users to influence the redesign of the systems' features, including values that were embedded in the system in design time.

## Facilitating Iteration between Pragmatic, Ethical and Moral Discourses

As mentioned earlier, the iteration between discourses is needed as the results of deliberation on pragmatic, ethical and moral issues in corresponding discourses are interdependent, e.g., the decision in moral discourse may require reassessment of the decisions in pragmatic discourse. Generally, as all discourses can be established within each phase of a system development project, the iteration between the discourses can take place within a single phase of the development process (e.g., within the design phase), but also between different phases, for example, an ethical discourse in the evaluation phase may initiate a pragmatic discourse in a redesign phase. This also applies to the case of informed consent, thus, there is no need to repeat what has already been said in previous sections. Note that there may be different entry points in this case. For example, participants may start with conceptual or empirical investigations and first establish an ethical discourse to articulate their views and understandings of the desired value of informed consent and its criteria. After having achieved a consensus on what criteria should be supported and how they are defined, they may establish a pragmatic discourse to discuss and set goals to support the values (criteria) agreed upon in the ethical discourses. This also involves a discussion on how to realize informed consent with design features/mechanism/strategies and their relations to other values. For resolving emergent conflicts with respect to the

chosen mechanism and their relations to other values, participants of a pragmatic discourse may seek alternative design options to avoid conflicts, or reenter an ethical discourse to reflect on values and to set value priorities. For dealing with permanent value conflicts or incommensurable values, participants may conduct a moral discourse to test whether designing diverse versions of the Cookie Manager Tool for different cultural communities is viewed as just. Further iterations may be initiated to test the conformity of the results of the pragmatic discourse with values/norms agreed upon in ethical/moral discourses.

## CONCLUSION

In this paper, VSD is regarded as a comprehensive framework for advancing a value-centered research and design agenda. By drawing on discourse ethics, we examined the VSD methodology and its applications and identified some gaps. We also suggested ways to integrate deliberative methods to move the VSD methodology toward the standards of discourse ethics. Finally, we revisited a VSD case and discussed the applicability of the ideas suggested. The major weakness of the VSD methodology has been the lack of explicit methods for promoting dialogical reflections in a systematic way with respect to many concerns. These include reflections on boundary issues with regard to the identification of relevant stakeholders and methods to be employed within a VSD project, reflections on diverse communication conventions in order to legitimate a common design communication, reflections on competing and incommensurable values to legitimate value trade-offs and/or norms for the purpose of justice, and finally reflections on other design decisions such as the selection of design goals and means.

Taking the discourse-ethical perspective, this paper has argued that systems designers functioning as moral agents will never truly be able to determine if moral actions are justified or not. Therefore, it is necessary to expand the design community into a public space, in socially inclusive ways that democratize the design process. From this perspective, the design decision rests largely with those individuals who live with the consequences of the design decisions. Discourse ethics suggests considering pragmatic, ethical, and moral issues in making design decisions. In this sense, it informs the design community of how to design systems in a pluralistic world where many diverse perspectives of what is 'good' exist and where solutions to ethical challenges must be found through the elaboration of valid and acceptable norms. By considering discourse ethics, we have complemented the VSD methodology with an explicit ethical theory, to provide ethical guidance for how competing or incommensurable values can be traded-off or resolved by creatively seeking just norms through the consideration of discourse ethical principles. These principles serve as criteria for distinguishing between legitimate and illegitimate regulations.

In addition, the discourse principle has been instantiated within different activities or types of investigations of the VSD methodology through a meta-communication model and discourse support tools. They facilitate discourses on different types of issues according to the discourse principle, including communication about the forms and norms of design communication, deliberation on design decisions with respect to the goals and means, as well as evaluation in design time and use time. We have shown that the discourse principle can be instantiated in different phases of a VSD project as well as at different levels, ranging from meta-level reflections on the design process to a discursive application of design guidelines within a design process. This can enable VSD projects to develop awareness and sensitivity for diversity of conventions, values, and interests. Moreover, we have complemented the VSD methodology with a practical method for dealing with the boundary issue, in particular for identifying relevant stakeholders critically. Boundary critiques can also be practiced with respect to methods that are to be employed in a VSD project, e.g., for assessing a method's underlying worldview or determining whether it marginalizes or includes opposing views.

Concerning the application of suggested concepts in practice, there may be different ways depending on the objectives and contextual conditions of a VSD project. Practitioners may start with boundary issues in order to define the boundaries of the project and identify potentially relevant stakeholders as well as those who represent them in the current VSD project. Then, they may proceed with a discussion on the methods and tools that are to be employed for communication as well as for any other activities within the development process. In this way practitioners can legitimate the communication process of the design and then continue with the application of user-centered design methods and tools, including in particular the discourse tools to reflect on design decisions. Within the development process they can establish different types of discourses and also deal with how to realize discourse mechanisms in the system interface to enable future users to articulate their views and needs in use time.

However, some final notes should be made with respect to limitations of these suggestions. First, many suggestions for supporting a discourse by implementing tools in user interfaces are only applicable to those types of information systems that have a user interface component. Nevertheless, the basic discourse-ethical idea that those affected by a technology should have a say in the decision making applies to all technologies, including implantable technologies. For technologies without communication facilities, those affected (or their representatives) may use other media such as the telephone or discussion forums in the web platform to articulate their experiences and views. Second, the open and less prescriptive nature of the VSD methodology makes the integration of discourse ethical principles easier. Even though discourse ethics prefer discursive mechanisms and methods for dealing with issues,

the plurality of methods does not conflict with it as long as those affected agree on the use of methods and accept the consequences under condition of an “ideal speech situation.”

Finally, we acknowledge that in the real world ethical values may collide with economic objectives, power, and other factors and we agree with Friedman et al. (2006b) in that even in such situations, VSD should be able to make positive contributions by showing alternative designs that better support enduring human values. Design with a positive lens requires multiple forms of positive inquiry (Avital et al., 2006), such as an appreciative inquiry which seeks strengths from positive emotions or a deliberative inquiry which employs positive critique to unmask barriers to change and arrive at morally, ethically and pragmatically sound decisions (Asif and Klein, 2009). This paper has mainly focused on the deliberative inquiry. Future research on VSD may consider further ideas from the critical research agenda (e.g., Cecez-Kecmanovic et al., 2008), including reflections on its critiques (e.g., Wilson, 1997) as well as its own ethical basis (e.g., Stahl, 2008), in order to establish a comprehensive framework for a deliberative VSD of information systems.

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