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Stephan Aier

Christian Fischer

Robert Winter

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Aier, Stephan, University of St. Gallen, Müller-Friedberg-Strasse 8, 9000 St. Gallen, Switzerland, stephan.aier@unisg.ch[*]

Fischer, Christian, University of St. Gallen, Müller-Friedberg-Strasse 8, 9000 St. Gallen, Switzerland, christian.fischer@unisg.ch[*]

Winter, Robert, University of St. Gallen, Müller-Friedberg-Strasse 8, 9000 St. Gallen, Switzerland, robert.winter@unisg.ch[*]

Abstract

A challenge in Information Systems Design Science Research (ISDSR) is the evaluation of constructed Information Systems Design Theories. March and Smith (1995, p. 254) state that "significant difficulties … result from the fact that artifact performance is related to the environment in which it operates." Therefore, it is nearly impossible to achieve stable knowledge of the utility of ISDSR artifacts. This is a severe problem because—as in each scientific discipline—it should be able to show that there is progress in ISDSR. In this paper, we propose an approach for improving the stability of knowledge of the utility of ISDSR artifacts. We focus on instability resulting from the social setting of an evaluation context. By applying Habermas's Discourse Theory, we show why a separation of stakeholder types is essential for gaining stable knowledge on the utility of ISDTs.

Keywords: Information Systems Design Science Research, Information Systems Design Theory, Progress, Evaluation, Stability.

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[*] Authors' names are listed in alphabetical order.

1   The Issue of Evaluating Information Systems Design Theories

Information Systems Design Science Research (ISDSR) is an emerging paradigm (Kuechler et al., 2007). In the context of ISDSR, some authors argue to develop Information Systems Design Theories (ISDTs) (cf. the analyses by Venable, 2006b; Kuechler & Vaishnavi, 2008a; Kuechler & Vaishnavi, 2008b). Since the basic contribution by Walls et al. (1992), ISDTs have been discussed in a variety of publications (Gregor, 2002; Markus et al., 2002; Goldkuhl, 2004; Walls et al., 2004; Gregor, 2006; Venable, 2006b; Venable, 2006a; Gregor & Jones, 2007; Gregor, 2009; Aier & Fischer, 2010). In this paper, we use the simple definition by Baskerville et al. (2009) and define a design theory as a "general solution to a class of problems". A design theory links a solution space to a problem space, thereby predicting a specific amount of utility (Venable, 2006b).

An important aim of any science, including ISDSR, is to achieve progress. In order to stress that progress and science belong together, Kuhn (1970, p. 162) poses the following rhetorical question: "Does a field make progress because it is a science, or is it a science because it makes progress?" Progress is generally defined as the step from a stage *A* to a stage *B* whereby *B* is "better" than *A* (Niiniluoto, 2007). Any endeavor that is worth to be called *scientific* should therefore be able to show its contribution to progress. Critical rationalism is also concerned with scientific progress. Popper understands science as an endeavor that approaches "truth" by formulating theories and by permanently trying to falsify them. As long as a theory has not been falsified, it can be pragmatically regarded as an approximation to truth (*verisimilitude*) (confer; Popper, 1935/1959; Popper, 1963). Then, a theory that has not been falsified for a long time is *stable* theoretical knowledge. It is stable because it can be defended against any argument, e.g., against experiment results or other observations.

In order to show scientific progress, the outcome of ISDSR has to be evaluated (March & Smith, 1995; Hevner et al., 2004; Peffers et al., 2007; Pries-Heje et al., 2008). "We evaluate artifacts to determine if we have made any progress" (March & Smith, 1995, p. 258). The most important criterion for evaluating a design theory is its utility (although it is not the only one, cf. Aier and Fischer (2009)). However, March and Smith (1995) identify an important problem related to the evaluation of an artifact's utility: "Significant difficulties … result from the fact that artifact performance is related to the environment in which it operates" (March & Smith, 1995, p. 254). This problem is severe. If an artifact's performance highly depends upon its environment, a judgment on its contribution to progress is hardly possible. To this end, stable knowledge of an artifacts' utility is necessary.

Then, the basic question arises: How can influences of the evaluation environment be reduced such that we attain stable knowledge on the utility of an ISDT? In our research, we found that Jürgen Habermas's discourse theory gives a helpful definition of stability (Habermas, 1973; Habermas, 1981/1984; Habermas, 1999/2003). He does not primarily refer to stability over time or over contexts; his notion of stability is discursive: knowledge is stable if it can be defended against any argument. Habermas does not only give a definition of stability, but he also enumerates preconditions under which such stable knowledge can be attained. These preconditions are called "ideal discourse". We argue that we can learn from Habermas for the evaluation of ISDTs.

The problem our paper deals with can be summarized by three propositions:
(1) It is essential for any science to show its contribution to progress (Kuhn, 1970).
(2) For judging the progressivity of ISDTs, stable knowledge of their utility is needed.
(3) The artifact's performance is dependent on the evaluation environment (March & Smith, 1995); therefore, instable knowledge of the utility of ISDTs results from an artifact's evaluation.

A prospective approach for solving this problem is based on the following proposition:
(4) Habermas's discourse theory defines a discursive notion of stability of knowledge (Habermas, 1973; Habermas, 1981/1984; Habermas, 1999/2003).

We assume that an analysis of Habermas's preconditions for an ideal discourse will help us to understand how to better gain stable knowledge on the utility of ISDTs. Especially the fact that Habermas does not only define stability, but also enumerates preconditions for attaining such stable knowledge encourages that our assumption might be correct. In order to verify this assumption, we would like to invite the reader to a thought experiment. At the end of this long journey, we will find out that a separation of stakeholder types will be necessary for attaining stable knowledge of the utility of ISDTs.

For developing this insight, we structure our paper as follows: Firstly, we show Habermas's discourse theory as foundations. Secondly, we apply Habermas's discourse theory to the evaluation of ISDTs, analyze challenges, and formulate the thesis sketched above as a result. Finally, we discuss the finding, showing related work as well as strengths and limitations of our paper.

2   Habermas's Discourse Theory

Habermas's work is vast and complex. Therefore, we are forced to restrict ourselves to those aspects of Habermas's Discourse Theory that we consider to be most relevant for the argumentation in this paper. Moreover, Habermas's contributions have been discussed by the best living philosophers and sociologists over the world; and, in accordance with his theory, he changed some of his propositions in response to criticism. For this reason, Habermas's work is relatively heterogeneous. We therefore have to select his main contributions to be studied for this paper. Most of our argumentation relies on Habermas's main work: *The Theory of communicative action* (firstly published in German, English translation in 1984). In addition, we consider his early paper on theories of truth (*Wahrheitstheorien*, Habermas, 1973) that Habermas had never allowed to be translated because he revised his opinion presented therein later-on. This revision is mainly documented in his paper *Truth and Justification* (1999/2003), which we also studied. In order to consider his entire work, we moreover used secondary literature, such as the article on Habermas by Bohman and Rehg (2009) published in *Stanford Encyclopedia of Philosophy*. As we consider Bohman and Rehg's (2009) article to be very comprehensive, we strongly orientate our presentation of Habermas's Discourse Theory at their summary.

Habermas's Discourse Theory is based upon the assumption that language is a medium for coordinating action. "Coordination through language requires speakers to adopt a practical stance toward 'reaching understanding', which he regards as the 'inherent telos' of speech. When actors address one another with this sort of practical attitude, they engage in what Habermas calls 'communicative action', which he distinguishes from strategic forms of social action. […] In strategic action, actors are not so much interested in mutual understanding as in achieving the individual goals they each bring to the situation" (Bohman & Rehg, 2009, section 3.1). An example for a strategic form of action is a cooperation of an actor *A* with an actor *B*, not because *A* finds *B's* goals inherently interesting or worthy, but because of what *A* gets out of the bargain. In strong communicative actions, in contrast, speakers coordinate their action and pursuit of individual (or joint) goals on the basis of a shared understanding that the goals are inherently reasonable or merit-worthy. In communicative action, actors freely agree that their goal is reasonable. At that end of a strong communicative action, social cooperation is both *deeply consensual and reasonable*: actors sincerely agree that their modes of cooperation can be justified as good, right, and free of empirical error.

In order that a communicative action succeeds in reaching understanding, the hearer must take up an affirmative position toward the claim made by the speaker. "In doing so, the hearer presumes that the claims in the speech act could be supported by good reasons […]. When the offer made by the speaker fails to receive uptake, speaker and hearer may shift reflexive levels, from ordinary speech to 'discourse'—processes of argumentation and dialogue in which the claims implicit in the speech act are tested for their rational justifiability as true, correct or authentic" (Bohman & Rehg, 2009).

Habermas distinguishes different types of validity claims (German: *Geltungsansprüche*). The term validity claim connotes the idea that a claim, i.e., a statement, merits the addressee's acceptance because it is justified or true in some sense. In order to be acceptable, successful speech acts must satisfy

the demands connected with three basic validity claims: sincerity, rightness, and truth. To recognize the validity of such claims is to presume that good reasons could be given to justify them in the face of criticism. As we are interested in truth (or justifiability) of teleological actions in the paper at hand (i.e., claims referring to the utility of ISDTs), we are mainly concerned with cognitive-instrumental expressions, related to the validity claim "truth of propositions and efficacy of teleological actions" (cf. table of validity claims in Habermas, 1981/1984, p. 23). Each type of validity claim requires a specific type of argumentative practice appropriate for its justification. The appropriate type of argumentative practice for determining truth of propositions or efficacy of teleological actions is the Habermasian *theoretical discourse*. (In contrast, the Habermasian *practical discourse*, for instance, deals with the rightness of norms of actions; it is therefore a moral discourse.)

1	No one capable of making a relevant contribution has been excluded.
2	Participants have equal voice.
3	Participants are internally free to speak their honest opinion without deception or self-deception.
4	There are no sources of coercion built into the process and procedures of discourse.

Table 1:   *Pragmatic presuppositions of participants of a discourse that is meant to be a severe critical test (ideal discourse), according to Habermas (2005, p. 85)[1]*

The quality of an argument depends on how well one has taken into account all relevant information and possible objections. Therefore, robust "critical testing of competing arguments depends on the rhetorical quality of the persuasive process. Habermas conceives the rhetorical level in terms of highly idealized properties of communication, which he initially presented as the conditions of an 'ideal speech situation' (Habermas, 1973; ...). That way of speaking now strikes him as overly reified, suggesting an ideal condition that real discourses must measure up to, or at least approximately satisfy—motifs that Habermas himself employed until rather recently […]. He now understands the idea of rhetorically adequate process as a set of unavoidable yet counterfactual 'pragmatic presuppositions' that participants must make if they are to regard the actual execution of dialectical procedures as a sufficiently severe critical test" (Bohman & Rehg, 2009, section 3.2). Habermas (2005, p. 89) proposes four such presuppositions: (1) No one capable of making a relevant contribution is excluded; (2) all participants have equal voice; (3) all participants are internally free to speak their honest opinion without deception or self-deception; and (4) there are no sources of coercion built into the process and procedures of discourse (cf. Table 1). The four presuppositions can be summarized as full inclusion, non-coercion, and equality. Referring to the last three presuppositions, an ideal discourse is also sometimes called a hierarchy-free discourse.

"These conditions are counterfactual in the sense that actual discourses can rarely realize—and can never empirically certify—full inclusion, non-coercion, and equality. At the same time, these idealizing presuppositions have an operative effect on actual discourse: we may regard outcomes (both consensual and non-consensual) as reasonable only if our scrutiny of the process does not uncover obvious exclusions, suppression of arguments, manipulation, self-deception, and the like (Habermas, 1999/2003, p. 108). In this sense, these pragmatic idealizations function as '*standards* for a self-correcting learning process' (Habermas, 2005, p. 91)" (Bohman & Rehg, 2009, section 2.3). For simplifying our terminology, we call, in accordance with Habermas's early works, a discourse that fulfils these conditions an *ideal discourse*.

In his early contributions, especially in Habermas (1973), Habermas equated empirical truth with ideal justifiability. But, confronted with rough critique, Habermas quickly realized that such a consensus theory of truth downplays the metaphysical character of truth. He therefore developed a different no-

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[1]   The table is based on the translation by Bohman and Rehg (2009, section 3.2).

tion of truth, published in Habermas (1999/2003)—and never allowed his early contribution on theories of truth (Habermas, 1973) to appear in English (Bohman & Rehg, 2009, section 3.3). Habermas now proposes a theory of truth that "is realist in holding that the objective world, rather than ideal consensus, is the truth-maker. If a proposition (or sentence, statement) for which we claim truth is indeed true, it is so because it accurately refers to existing objects, or accurately represents actual states of affairs—albeit objects and states of affairs about which we can state facts only under descriptions that depend on our linguistic resources. […] Habermas eschews the attempt to explicate the relationship between proposition and world metaphysically (e.g., as in correspondence theories). Rather, he explicates the meaning of accurate representation pragmatically, in terms of its implications for everyday practice and discourse. Insofar as we take propositional contents as unproblematically true in our daily practical engagement with reality, we act confidently on the basis of well-corroborated beliefs about objects in the world. What Habermas (1981/1984, p. 23) calls 'theoretico-empirical' or 'theoretical' discourse becomes necessary when beliefs lose their unproblematic status as the result of practical difficulties, or when novel circumstances pose questions about the natural world. Such cases call for an empirical inquiry in which truth claims about the world are submitted to critical testing" (Bohman & Rehg, 2009, section 3.3).

In summary, according to Habermas's Discourse Theory, the validity of claims referring to the truth of propositions or the efficacy of teleological actions can be tested in a special type of ideal discourse: a theoretical discourse. Critical testing of validity claims requires speakers to adopt a practical stance toward reaching understanding. At the end of such a discourse, social cooperation is both deeply consensual and reasonable: actors sincerely agree that their modes of cooperation can be justified as free of empirical error. Pragmatic presuppositions of participants of such a discourse can be summarized as full inclusion, non-coercion, and equality (cf. Table 1); sometimes, it is also called hierarchy-free discourse.

3 Applying Habermas's Discourse Theory

After having outlined Habermas's discourse theory, we analyze how to apply it to the evaluation of ISDTs. We start our argumentation with an analysis of the *form* of utility statements—or utility claims. A formal definition of utility claims is a necessary condition for conducting a sound analysis based upon Habermas's Discourse Theory. Thereafter, we test to what extent Habermas's requirements for an ideal discourse are realized in a real business context. We firstly apply Habermas's theory in a naïve way. However, as we will see, a different approach is necessary for achieving stable knowledge of the utility of ISDTs. Based on the analysis' results of the naïve application of Habermas's Theory, we propose an approach for realizing stable knowledge about the utility of ISDTs.

3.1 Formalizing Statements on the Utility of ISDTs

Almost every author on ISDSR or IS Design Theories (ISDT) emphasizes the utility of ISDTs (cf. Table 2). Nonetheless, the term *utility* remains fuzzy as we could not find any publication which concretizes what is meant by utility of an artifact or an ISDT. However, such a formalized definition of utility statements—or, as Habermas would say, utility claims—is crucial for a sound analysis based on Habermas's Discourse Theory.

We start our analysis with a discussion concerning theories of truth which is held in philosophy. As shown above, Habermas's Discourse Theory is related to theories of truth—although Habermas revised his early work later-on. For our analysis, we first introduce the linguistic distinction in philosophy between truthmakers and truthbearers. This distinction can be transferred to Habermas's Theory: The term truthbearer refers to "things of which it makes sense to ask whether they are true or false" (David, 2009, section 2.1; cf. also Glanzberg, 2009, section 2.1). Common candidates for truthbearers are "beliefs, thoughts, ideas, judgments, statements, assertions, utterances, sentences, and propositions" (David, 2009, section 2.1). In contrast, a "truthmaker is anything that makes some truthbearer

true" (David, 2009, section 2.1; cf. also Glanzberg, 2009, section 3.3). Truthbearers and truthmakers should therefore correspond to each other. Depending on the truthbearer, common candidates for truthmakers are "facts, states of affairs, events, things, tropes, etc." (David, 2009, section 2.2).

Source	Citation
Baskerville (2009, p. 1)	"[T]he artifact represents a general solution to a class of Problems."
Hevner et al. (2004, p. 80)	"The goal of design science research is utility."
March and Smith (1995, p. 253)	"Its products [i.e. products of design science research] are assessed against criteria of value or utility."
Walls et al. (1992, p. 40)	"Design theories must deal with goals as contingencies."
Winter (2008, p. 40)	"IS design science research aims at utility. ... Since design-oriented IS research is aimed at the construction of 'better' IS-related problem solutions, utility for practice is established as a clear and common measure of its results' relevance."

Table 2.   Exemplary citations on the utility, the goal-orientation, or the problem-solving capacity of ISDTs

If we are to understand Habermas's Discourse Theory as a theory of truth, truthbearers in his theory would be *claims*. As shown above, Habermas differentiates five types of claims. So, what kind of claim is a "utility claim" when referring to ISDTs? To answer this question, we discuss different candidates for utility claims.

On the one hand, an artifact can be useful for an individual. An individual has specific interests and goals, and the artifact might help the individual to achieve these goals. Imagine that Mary intends to drive a nail into a wall; then, she might consider a hammer to be useful for her. We call the utility claim "A hammer is useful for Mary" a *subjective utility claim*, and formalize the first candidate for a utility claim as follows:

> Claim C1: Artifact a is useful for person p.
> (Subjective utility claim, e.g., "A hammer is useful for Mary.")

On the other hand, a utility claim could state that an artifact is objectively useful for solving a particular problem or reaching a particular goal. Baskerville (2009, p. 1) relates the artifact to a class of problems; Winter (2008, p. 40) takes a similar approach. Walls et al. (1992, p. 40) stress that IS design theories deal with goals (cf. Table 2). These three examples can be formalized in the form of *objective utility claims* as follows:

> Claim C2: Artifact a is useful for reaching goal g/for solving problem p/…
> (Objective utility claim, e.g., "A hammer is useful for driving a nail into a wall.")

The connection between candidate C1 and candidate C2 is obvious. C1 is not opposed to C2, but both complement one another. The subjective formulation of the utility claim presupposes that the individual intends to reach a goal or to solve a problem: If Mary did not intend to drive a nail into a wall, then a hammer would not be useful for her. On the other hand, only a (rationale) subject can have a goal or an intention.[2] A goal is unthinkable without a subject that has this goal. Therefore, a goal implies the existence of a subject that has this goal/intention. The connection between both is explicated in the following candidate for a utility claim:

> Claim C3: Artifact a is useful for person p who intends to reach goal g/to solve problem
> p/…

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[2]   Of course, in everyday language, objects are sometimes personified. For instance, one might say: "Be aware of that computer virus. It wants to delete all your e-mails." Nevertheless, we would never argue that the computer virus acts intentionally. Intentional action presupposes rationality; and rationality is reserved for subjects.

(Subjective utility claim with explicated intention, e.g., "A hammer is useful for Mary, who intends to drive a nail into a wall.")

Which of these claims are suitable for a *stable* utility claim? It is obvious that a candidate for a stable utility claim should be independent of any specific subject. Therefore, claim C2 seems to be the most stable utility claim of the three candidates proposed. This is not surprising; the citations shown in Table 2 are, at a first glance, all independent of subjects. But, as shown above when introducing the third claim, a goal (and similarly a problem) presupposes a (rationale) subject. Therefore, claim 2 is only seemingly independent of a subject. As claim 3 explicates this relation, we will continue our argumentation with claim 3.

So, how can we—based on Habermas's Discourse Theory—justify a stable utility claim that has the form of claim C3? In the introduction, we defined a stable claim to be a claim that can be defended against any argument. We then presented Habermas's Discourse theory in which he describes an ideal discourse situation. The validity of a claim referring to the efficacy of a teleological action can be "tested" in theoretical discourse. The better the participants of such a discourse respect the rules for an ideal discourse listed in Table 1, the more we can be sure that the claim can be defended against any argument. Thus, the theoretical discourse allows for a generalization of the utility claim C3. The personal claim of Mary, "A hammer is useful for me who intends to drive a nail into a wall," becomes an inter-subjectively accepted claim: "A hammer is useful for those of us who intend to drive a nail into a wall." We formulate claim C4 as an inter-subjective claim:

Claim C4: Artifact a is useful for the group of persons G whose members intend to reach goal g/to solve problem p/…

(Inter-subjectively validated utility claim with explicated intention which results from an ideal theoretical discourse, e.g., "A hammer is useful for the group of craftspeople, who intend to drive a nail into a wall.")

We could now define guidelines for how to realize an ideal discourse for ISDT evaluation. Researchers could, for instance, try to establish an ideal discourse situation by conducting a focus group.[3] But, the requirements for an ideal discourse seem to fundamentally contradict the structure of enterprises. Enterprises are usually hierarchical organizations, so how can we achieve a hierarchy-free discourse in which the presuppositions shown in Table 1 are respected by all participants? And how can an ISDT's evaluation be interpreted if it results from a hierarchy-free discourse, but is meant to be implemented in a strongly hierarchical environment? These two questions are discussed in the following subsection.

3.2 Why a Naïve Application of Habermas's Discourse Theory does not Result in Stable Knowledge of the Utility of ISDTs

Habermas suggests not excluding anyone from an ideal discourse who is capable of making a relevant contribution. When an instantiation of any innovative IS artifact is implemented in an enterprise, then usually a variety of stakeholders are concerned. According to Habermas, all these stakeholders have the potential to make relevant contributions. Moreover, all participants should have equal voice.

In management literature, stakeholder theory is discussed. "A stakeholder in an organization is (by definition) any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984, p. 46). Stakeholder theory can be used instrumentally because "it establishes a framework for examining the connections, if any, between the practice of stakeholder management and the achievement of various corporate performance goals" (Donaldson & Preston, 1995, pp. 66–67). In practitioner literature on project management, such an instrumental use of stakeholder theory, called stakeholder analysis, is strongly recommended for project managers, i.e., the

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[3]   We take focus groups as an example, here. However, we will argue that our findings are not restricted to focus groups.

identification of stakeholders and their influence on the project (cf., e.g., Project Management Institute, 2004, pp. 27–32). At least since Markus's (1983) seminal article, we have known that power and politics highly influence the acceptance of Management Information Systems. Therefore, it is fully justified that an IS project manager who is interested in the success of his or her project should consider project stakeholders *and* their influence or power.

Imagine now that a focus group is organized with the aim of evaluating the utility of a particular ISDT. Following Habermas's requirements, no one capable of making a relevant contribution has been excluded—i.e., all stakeholders are present. Further imagine that we tell all participants that each of them has an equal voice, that they should feel free to speak their honest opinion, and that no one may exert coercion on any other participant. Incidentally, from the background described above, it is unrealistic that stakeholders who are used to exercising power on each other and to playing political games should begin to discuss in such an ideal (i.e., hierarchy-free) setting of discourse, simply because they are asked to do so. But, this is not the point of our argument. The point is: If they accepted the conditions of an ideal discourse an IS design science researcher could not interpret the results of such an ideal (i.e., hierarchy-free) discourse. The results could not be interpreted because, in a real business situation, participants would (certainly) argue differently. Some stakeholders would (certainly) be more powerful than others. It could be that some were excluded from the discourse, and it is even thinkable that some exert coercion on others. In result, a decision on the utility of the ISDT in a real business context would fundamentally differ from a consensus resulting from an unrealistic hierarchy-free discourse.

3.3 How Habermas's Theory should be Applied for Reaching Stable Knowledge of the Utility of ISDTs

So, is Habermas's Discourse Theory useless for the evaluation of ISDTs? We argue that it is not useless, but that it has to be applied in a different way than described above. Remember that our aim here is stable utility claims. We defined that a utility claim is the more stable the better it can be defended against arguments. For analyzing utility claims, we formalized three types of utility claims (C1, C2, and C3); the third claim explicated implicit presuppositions of the first and second ones. It had the following form: "Artifact *a* is useful for person *p* who intends to reach goal *g*/to solve problem *p*/…" The problem with the "naïve" approach sketched above is that it ignores the fact that different stakeholders have different goals. Markus (1983), for instance, analyses a case study on the introduction of a financial information system (FIS) and states:

> "Corporate accountants designed and used FIS to create a substantial change in the distribution of, or access to, financial data, a valued resource. It is not surprising that those who gained access (corporate accountants) were pleased with the system and that those who lost control (divisional accountants) resisted it by writing angry memos, maintaining parallel systems, engaging in behavior that jeopardized the integrity of the database, and participating in a task force with the public objective of eliminating FIS and replacing it with another system" (Markus, 1983, p. 438).

This example shows that different stakeholders often have different goals and different expectations with respect to information systems. In the transition from claim C3 to the inter-subjectively accepted claim C4, the persons who consider the claim to be valid vary from an individual to a group; but the goal *g*, and respectively the problem *p*, remain invariant in the transition from C3 to C4. So the "solution" of our problem is not to try to achieve a consensus among different stakeholders who have slightly different goals, but to separate different stakeholder types. Then and only then, we will have the chance to gain stable knowledge on the utility of ISDTs because the members of each of the discourses all have, by definition, the same goal *g* and respectively intend to solve the same problem *p*. The price for such a separation, of course, is that we cannot reduce the utility of an ISDT to a single dimension. The question rises how to react to the problem that knowledge is now no longer comparable. A strongly relativist view holding that even contradictory knowledge of different individuals

could be true is not helpful from the authors' point of view. Restrictions of article length do not allow us to discuss this issue extensively. However, we would like to remark that it reflects an inherent complexity of socio-technical systems which cannot be reduced.

	Stakeholder Type 1	Stakeholder Type 2	Stakeholder Type 3
Company A	pros/cons	pros/cons	pros/cons
Company B	pros/cons	pros/cons	not existent
Company C	pros/cons	not existent	pros/cons

Table 3:   Fictional Example

Before discussing the contribution of this paper, however, we would like to illustrate our idea by referring to a small, fictional example. In Table 3, we list three stakeholder types (*1–3*) and three companies (*A–C*). In company *A*, stakeholders of all three types could be identified. In companies *B* and *C* stakeholders of type *3* and type *2* respectively do not exist. In a naïve evaluation based on Habermas's Discourse Theory, we would strive for a consensus among all stakeholder types, based on an ideal discourse. We argue that such a consensus cannot be interpreted because decisions taken in business are not based on the results of a hierarchy-free discourse. We therefore argue to strive for a consensus among the stakeholders of each type; i.e., to strive for a consensus between stakeholders of type *1* from companies *A*, *B*, and *C*, between stakeholders of type *2* from companies *A* and *B*; and, finally, between stakeholders of type *3* from companies *A* and *C*.

4   Discussion

4.1   Summary

Our argumentation can be summarized as follows (points (1)–(4a) are taken from the introduction):
(1) It is essential for any science to show its contribution to progress (Kuhn, 1970).
(2) For judging the progressivity of ISDTs, stable knowledge of their utility is needed.
(3) The artifact's performance is dependent on the evaluation environment (March & Smith, 1995); therefore, instable knowledge of the utility of ISDTs results from an artifact's evaluation.
(4) (a) Habermas's discourse theory defines a discursive notion of stability of knowledge. (b) He enumerates preconditions for attaining stable knowledge: stakeholders agree on that knowledge in an ideal (or hierarchy-free) discourse (Habermas, 1973; Habermas, 1981/1984; Habermas, 199/2003).
(5) When evaluating an ISDT, we single utility claims that encompass (i) an ISDT, (ii) a goal, and (iii) the individual that pursues this goal and that performs the evaluation. Generalized utility claims are independent of the individual (cf. section 3.1).
(6) Habermas's discourse theory proposes a way to achieve generalized, stable utility claims: Individuals agree on the utility of an ISDT in a hierarchy-free discourse.
(7) Enterprises are usually hierarchical organizations. Even if individuals from a hierarchical organization came to a consensus in a hierarchy-free discourse, this consensus could not be interpreted for the hierarchical organization. (In a real business situation, it would only be a coincidence if the result of a discourse was the same as that of a hierarchy-free discourse.) The problem is that different stakeholders have different goals.
(8) Therefore, for attaining stable knowledge of the utility of ISDTs, the utility evaluation results should be aggregated separately for every stakeholder type.

4.2   Related Work

We reviewed literature on IS research methods, IS design science, and IS philosophy and searched for a link to Habermas's discourse theory. We found two epistemological frameworks referring to Habermas's discourse theory: Becker and Niehaves (2007) propose an epistemological framework, based upon a literature review. On one layer of their framework, *notions of truth* are differentiated, among them the *consensus theory of truth* referred to by Habermas (1973; 1981/1984). In addition to the literature reviewed by Becker and Niehaves (2007), we identified Frank (2006) as a publication on theories of truth in IS. Both Becker & Niehaves (2007) as well as Frank (2006) consider Habermas's theory as a means for justifying IS research results. Moreover, we found literature on evaluations in focus groups which are partly based on Habermas's discourse theory (Gibson & Arnott, 2007; Tremblay et al., 2008; Tremblay et al., 2010). But, none of these authors discusses the aspect of stability. To the best of our knowledge, our research is original.

4.3   Implications

Our proposition to separate stakeholder types has strong consequences. The utility of an ISDT is then multi-dimensional: one dimension for each stakeholder type. According to March and Smith (1995, p. 258), "we evaluate artifacts in order to determine if we have made any progress." To this end, the utility of an ISDT has to be compared to state-of-the-art solutions. Such a comparison necessitates a stable knowledge of the utility of both ISDTs to be compared. A good implication of our research is that the chance of obtaining stable knowledge on the utility of ISDTs has been improved. An unfortunate implication of our research is that utility is multidimensional, one dimension for each stakeholder type. If we compare ISDT *a* with ISDT *b*, it might be the case that *a* is more useful for stakeholder type 1 whilst *b* is more useful for stakeholder type 2. We argue however that the stakeholder-dependence of the utility of an ISDT reflects the inherent complexity of a socio-technical environment. We can therefore not be allowed to ignore this complexity if we are interested in valid research results.

4.4   Limitations and Future Research

Our research has mainly two limitations. Firstly, we restrict our analysis to the social part of an evaluation context. It is indisputable that, by making this restriction, we exclude all kinds of technical dependence from our analysis. Of course, the reason that a particular ISDT performs better in company *A* than in company *B* can be due to different technical architectures in the respective companies. In this paper, we are not concerned with the dependence on the technical part of the evaluation context. It is worthwhile to remark, however, that such dependence does not reduce the contribution of our research. Imagine the stakeholders of type 1 shown in Table 3 all have different technical architectures in their respective company. Nevertheless, in an (approximately) ideal discourse, participants can discuss the differences in their respective environments. Moreover, to come to a consensus must not be confused with the reduction of the data to a single value for utility. Of course, a consensus can also result in a multi-dimensional context. That is, participants might come to the consensus that the ISDT in question is useful, for instance, for companies *A* and *C*, but not for *B*, because of differences in technical architecture. And—in contrast to consensus among stakeholders of different types, i.e., with different goals—such consensus is interpretable, i.e., applicable to real business. Secondly, our research remains a theory-based argumentation. We have not evaluated in practical research if the separation of stakeholders really leads to more stable knowledge on utility. This is to be addressed in future research.

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