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On Values in Information Systems Research

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Abstract. Values, explicit or implicit ones, play an important role in information systems research. In the research field there are many interesting parties, e.g. researchers, people under study and different 'third parties'. In the research process three phases (design, implementation and evaluation) are differentiated. This author performed an empirical study on values in information systems research and asked which kinds of the three groups' values come up in the three phases of a study. The doctoral students and young doctors informed their views on values on those groups and phases. A new tentative model was prepared, and both supporting and conflicting evidence with the earlier studies was also presented.

Introduction

Values play many roles in scientific research. We can differentiate researchers', examinees' and third parties' (e.g. the financing body's, organization's under study and peer reviewers') values. To consider a researcher, we can find many recommendations: In certain studies, it is demanded that the researcher must be a neutral observer, i.e. she must not influence on the object under study. In some other studies the researcher cannot have any pre-view but she must base her theoretical derivations on the collected data only (the grounded theory, Strauss and Corbin 1990). Hence, on the one hand there are studies where the researcher cannot have any values, but on the other hand, it is expected that the researcher at the end of her study should analyze which kind of practical and scientific recommendations or agendas she should give. This emphasizes the scientific importance of values. – It also has the responsibility dimension, because there are also studies, in which it is expected that the researcher has certain values, e.g. she refuses to participate in the development of weapons.

The examinees, the objects under study, can have differing values, too. In many studies concerning the methodologies for the development of information systems (Lyytinen 1987), values are totally neglected, i.e. the consensus is then implicitly assumed. The opposite view, i.e. that conflicts exist in all the organizations, is also sometimes pre-supposed (Virkkunen and Kuutti 2000). This differentiation is well known. Burrell and Morgan (1979) take the dimension from the macro level of society. They allocate theories within dichotomy between the sociology of regulation and the sociology of radical change. Deetz (1996) call those two poles as consensus and dissensus. ”The consensus pole draws attention to the way some research programs both seek order and treat order production as the dominant feature of natural and social systems. – The dissensus pole draws attention to research programs which consider struggle, conflict, and tensions to be the natural state.”

There are many possibilities for the third party. For example, Reeves and Bednar (1994) attempt to clarify and explicate definitions of quality by (a) tracing their history or “roots”, (b) examining their strengths and weaknesses, and (c) describing the trade-off inherent in accepting one definition of quality over another. The following definitions of quality are considered: I. Excellence, II. Value, III. Conformance to specifications and IV. Meeting and/or exceeding customers’ expectations. The excellence is the so called general measure. The other three quality measures can be joined with a certain third party. The managers normally emphasize value as the greatest measure of quality. The systems analysts appreciate their resulting system with the high quality, if it conforms to specifications. The customers do the same, if the resulting system meets their expectations. – Hence, we have much evidence that values have the practical importance.

In each of three groups, (researchers, examinees and third parties) there seem to be conflicting views on values. To this end it is important to more thoroughly study values. We still divide a research process into three sequential phases: design, implementation and evaluation. By combining three groups and three phases we get 9 research questions:

1. Which kinds of the researcher’s values come up in the design of a study?
2. Which kinds of the examinees’ values come up in the design of a study?
3. Which kinds of the third party’s values come up in the design of a study?
4. Which kinds of the researcher’s values come up in the implementation of a study?
5. Which kinds of the examinees’ values come up in the implementation of a study?
6. Which kinds of the third party’s values come up in the implementation of a study?
7. Which kinds of the researcher’s values come up in the evaluation of a study?
8. Which kinds of the examinees’ values come up in the evaluation of a study?

9. Which kinds of the third party's values come up in the evaluation of a study?

The format of the research questions describe that we are interested in different kinds of group members' (researchers, examinees, third parties) values in three phases. In our empirical study we shall ask our doctoral students about their views on values. Because values are the very sensitive topic, we shall before our analysis of empirical material present our own presuppositions on values related to those 9 questions. Finally we shall relate our results to the literature.

Definition of the value concept

Aulin (1982, 14) considers human action as an interaction between a *subject* and an *object*, that is, between a conscious actor and some part of the real world, the latter being the object of the acts discussed. … Separating the subject from the object enables Aulin to regard *acts* as the tools of interaction between a subject and the world of objects. The interaction is a two-way traffic. Certain kinds of acts - the observations – cause some part of reality to be reflected in the subject's consciousness, as a consequence of which he gets *information* about the world. The information is somehow processed in the consciousness and set in contact with the *intentions* that are pushing the subject's acts to certain directions or goals. Making use of his directed acts the subject then is capable of impressing his intentions on the world and possibly changing it in some measure to some desired direction. In a closer analysis Aulin distinguishes between three major categories of the contents of human consciousness (Figure 1):

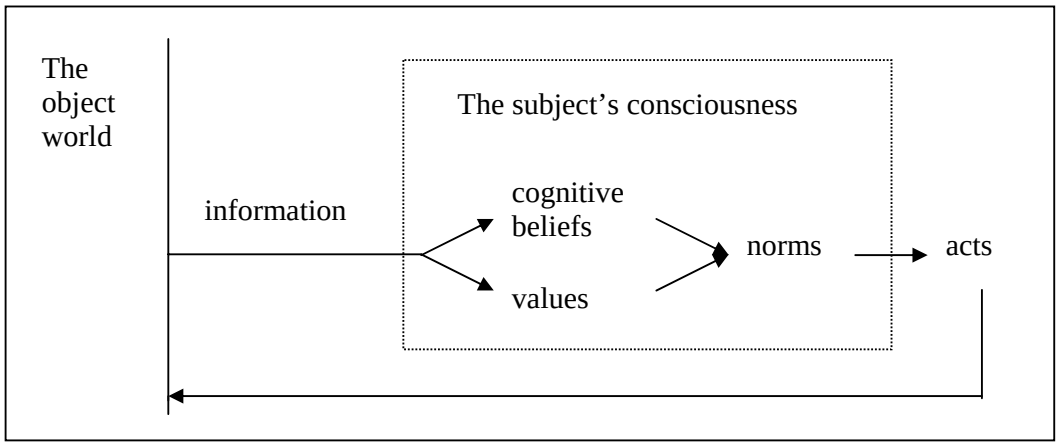

Figure 1. Human action as a subject-object interaction (Aulin 1982, p. 15)

1. *cognitive beliefs* expressing the information the subject has on the actual state of the world, mostly in form of some generalizations (the ‘is’);

2. *values* voicing the conception that the subject has constituted of what the world ought to be in order to be good (the ‘ought’); and

3. *norms* telling the subject how to choose his acts so as to materialize his values in the actual state of the world (also a part of the ‘ought’).

The norms obviously are functions of values and cognitive beliefs. Accordingly Aulin has the preliminary scheme of the successive steps of human action shown in Figure 1.

(Comment: To our mind, term ‘norm’ should be understood as procedural norms, not as collective norms as usually.) - To explain our idea a bit more we pay attention to two things: 1. our beliefs contain the subjective probability component, how probable our world view is. We receive more information and our world view becomes more valid, relevant and realistic. This may influence on our commitment. 2. Values are our preferences in priority order. The stronger a certain value connected with a particular entity is, the more committed we are with that entity.

Our presuppositions on values

The reason to present our values here is that we shall use open questions in gathering data, and the analysis of the conceptions expressed by our respondents, and it is very sensitive to the researcher’s pre-suppositions and interpretations. In our presentation we shall follow the order of the 9 questions.

1. The researcher’s values in the design phase. In our studies we try to emphasize both relevance and rigor. We see values in design science studies (March and Smith 1995, Hevner et al. 2004, van Aken 2004), because utility of the design outcome is there stressed on. As we earlier presented we also see values behind the all kinds of the normative methodologies, although the values are seldom explicitly expressed.

2. The examinees’ values in the design phase. We try to allow the examinees of our study to express their values without our influence beforehand. We prefer the open questions in questionnaire and interview plans, because we see a human being as a person with free will, i.e. she can change her goal function whenever she wants. To our mind, the self-steering system Aulin 1989, p. 173) is the most real model of a human being.

3. The third party’s values in the design phase. There are many third parties in the information systems (IS) studies: sponsors, research site owners, co-workers of the examinees, peer reviewers etc. Following Buchanan’ et al. (1988) advice we try to get in, get on, get out, and get back into our research site. In order to prepare ourselves we beforehand try to imagine different power games existing in our research site.

4. The researcher's values in the implementation phase. To structure our presentation we here use the taxonomy of research approaches (Figure 2).

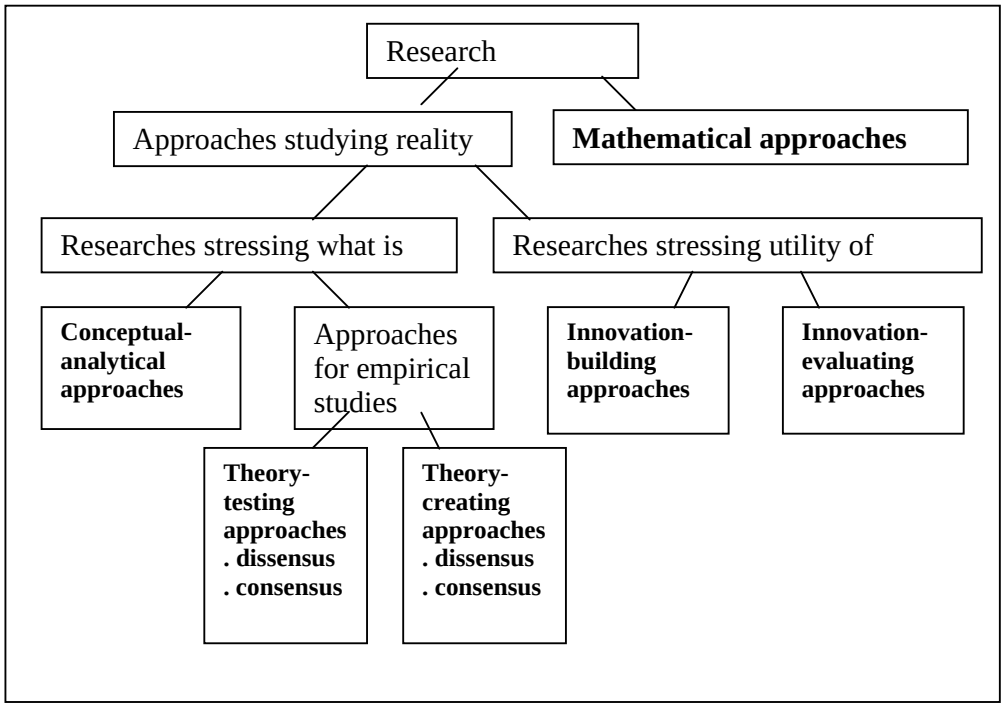

Figure 2. The taxonomy of research approaches (Järvinen 2004)

In our mathematical studies we try to prove the theorems as carefully as possibly, express all the assumptions explicitly, and to proceed step by step logically. In our conceptual-analytical studies we try to perform the literature survey as carefully as possible (in the allowable time limits). Depending on our pre-knowledge about the object under study, we try to select the best consensus or dissensus theory for our theory-testing study and act as the neutral observer. In addition, we also try to carefully prepare our instruments, perform all the recommended pre-test and –controls (Boudreau at al. 2001), and to follow all the advice in analysis and reporting. For our theory-creating studies we try to listen voices of our examinees and to find new subjects until the saturation point is achieved (Strauss and Corbin 1990). In addition, we try to give a chance to data to speak, and after the emergence of the tentative theory to give chance for supporting and conflicting literature (Eisenhardt 1989). To our mind, Klein and Myers (1999) gave good rules to follow. In our innovation-building studies we try to clearly present the key concept (in the sense of business concept) behind of our

construction. We also present our design alternatives and the selected one with supporting arguments in different phases of the building process. In our innovation-evaluation studies we first compare the innovation with its original specifications. Thereafter we try to identify and measure its desired and undesired effects.

5. The examinees' values in the implementation phase. We do not have anything to add to our description in item 2 above.

6. The third party's values in the implementation phase. We try to perform our study without any conflicts with any third party.

7. The researcher's values in the evaluation phase. In the final research report, in its Discussion section we try to relate our results with the literature and present the limitations of our study.

8. The examinees' values in the evaluation phase. Because the values are sensitive topic we shall respect the values presented our examinees and guarantee the privacy of our examinees in our reports.

9. The third party's values in the evaluation phase. From many third parties we here only consider peer reviewers. Based on our bad experiences, we must say that many reviewers have had different values from ours. An other potential explanation were that our report did not communicate.

The empirical study

The motivation to our empirical part was the conflicting views on values in the IS research. We cannot restrain the IS researchers to study values. The values play a central role in the information technology (IT) artifact building studies. The IT artifact is the key concept is the IS research (Orlikowski and Iacono 2001, Benbasat and Zmud 2003).

To our mind, the IS researchers are the suitable population from whom to ask their view on values in the IS research. We do not know any theory on values in the IS research differing from natural and social sciences because of the essential role of design research. Therefore we selected to make a tentative phenomenographic survey (Marton and Booth 1997) on different views. For practical reasons we selected some of our doctoral students and junior doctors to act as subjects in this study.

We sent our questionnaire (Appendix) with open questions to 44 doctoral students via e-mail. Totally15 of them responded. We shall analyze their responses by using the content analysis. We try to collect the most common views from each item first and the present the whole variation of other views. We gave the draft of our report to the respondents to confirm that we interpreted and classified their responses correctly. We structure our analysis in the same way as our own pre-suppositions.

1. The researcher's values in the design phase. The majority wrote that the researcher's values influence on her decision to define the research problem, select the research object and method. Her decisions can be based on her education and experiences in her life. In the objectivist methods the values play lesser role than in the subjectivist ones. Somebody mentioned the instrumental view, i.e. the researcher selects such a safe topic which best supports her career. It could be difficult for the researcher to perform the study with the values against own ones. The researcher's values can deviate from the examinees' values. The conception of a human being and her world-view mediate the researcher's selections in all the phases of the study, e.g. selection of the study population. The researcher's values also influence on whether she will take her examinees into the planning process or not. The artifact under study can be value-laden. In the building activity the researcher's values can differ from the customer's values, in the evaluation activity the researcher's values can differ from the artifact's values. We cite one answer: "My own values are more on the practical side. It is then important that my study is interesting and useful from the practical point of view. If it also brings value to science, it is the important but secondary aspect for me."

2. The examinees' values in the design phase. Almost all respondents said that examinees have different values; bosses have different values from their subordinates, and systems analysts have different values from the users of the system. The researcher must respect the differing views of her examinees. If the researcher beforehand knows that her values are different from her examinees' values, this might have influence on her research design. She might then prefer a distant approach (e.g. a survey with e-mail questionnaire) than an intimate one (e.g. a case study with interviews). If examinees beforehand know that their values differ from the researcher's values, they might refuse to participate in the study. The studies where innovations or artifacts are objects under study always contain the value dimension, which must be taken into account in the research design. In an action research project the local participants and the researcher must discuss about values and create and observe the rules of the game, e.g. confidentiality and openness. In the opinion studies the questions must be formulated in such a way that they provoke as little as possibly. The variables containing the value aspect must be planned to be processed differently from the variables that do not have any value aspect. It is ethically preferred that examinees know that they are research subjects than that they don't know.

3. The third party's values in the design phase. In the responses there were four different third-parties: a) the financing body, b) the organization under study, c) examinees' co-workers and d) other scholars. The financing body (a) can be the public institution or the customer who ordered the study, and they both have influence on the study. The former might have certain criteria (reflecting its values, e.g. to promote the national competitiveness) for supporting research, and it can in this way direct the study. The latter has certain objectives (with explicit

or implicit values) to utilize the results of the paid study and the customer might have a strong influence on both the content and form of the study. The customer might even present that "certain kinds of results are desired". If there are many financing bodies at the same time, it complicates the situation, the values of all the bodies must be taken into account. The researcher should, however, organize her study, especially data gathering, in such a way that the value-laden propositions can either be confirmed or falsified.

The organization (b) which allows the researcher to study some aspects of its functions and properties might state some restrictions for the study, e.g. to prevent the negative publicity, and this reflects some values. The subjects selected from the organization will not act as independent individuals but their behavior and responses will reflect the values of the organization. The examinees' co-workers (c) might also have the similar influence on the subjects.

The members of the scientific community (d), the advisor and colleagues, and their values have influence on the study the researcher is designing. This influence can be direct or indirect via an organizational culture, and values of the research institution.

4. The researcher's values in the implementation phase. The researcher's values are similar in the all phases. Many informants differentiated three sub-phases in the implementation: a) data gathering, b) data analysis and c) reporting. In each sub-phase the researcher can present or support her values and hide the opposite ones, although the honest working habits were much appreciated as a normative ideal. The wish to achieve the desired results might put less emphasis on data gathering than data analysis and reporting. The researcher must organize the data security measures to protect her raw data. The researcher should openly present her own values in the value-sensitive studies. In the action research and design science studies the researcher tries to realize her own values. In the use test of the new prototype the researcher must carefully pre-think her role and values in the course of the test. The researcher should prevent the trials of the outsider bodies from influencing on her study. The researcher's values have influence on selection of references.

5. The examinees' values in the implementation phase. Many informants assume that the research setting allows the subjects to present their values. The value conflict between the subjects and the researcher will diminish the examinees' willingness to present their values. To the open questions in interviews and questionnaire the subjects will more present those views they value than the views they don't value. The subjects are more willing to respond to the non-sensitive questions than the sensitive ones. The subjects are more willing to respond to the study that they appreciate than which they don't appreciate. The researcher will have difficulties to identify hidden values of her subjects and/or when the subjects lie. The subjects will emphasize their values in the design

science studies, and in the use test the gathering of development ideas from users must be carefully designed.

6. The third party's values in the implementation phase. The most general response to this item was: The third party's values come up in the implementation of a study in the same way as in connection with item 3 above, i.e. the design dominates the implementation. Somebody likes to emphasize that the employer's values have influence on the study, the other says that the advisor's (professor's) values have influence on the study performed by her doctoral student. The legitimized organizational culture may restrict the way how the study is performed. The vendor can regulate how a certain artifact can be evaluated. The parents can deny their children to participate in the study. The values of the financing body can be seen directly or indirectly via the budget and schedule of the study. The customer organization can influence on data gathering by regulating which data are given to the researcher. The researcher can utilize the third party to mediate the raw data from the subjects to her and in this way achieve the privacy of the subjects.

7. The researcher's values in the evaluation phase. To our mind, almost all the respondents in this item presented such views that belong to the item 4. It seems to us that the respondents regard the data gathering and analysis sub-phases to the implementation phase but derivation of conclusions and reporting to the evaluation phase. Some warn that the researcher could be inclined to include many references to her own earlier studies into her final report. It was also recommended that the researcher should evaluate the potential applicability of the results both for the examinees, the organization, the financing bodies and the scientific community. The researcher must be critical towards her own starting points, her limited capabilities to analyze, understand and interpret data.

8. The examinees' values in the evaluation phase. In this item the boundary between the implementation phase and the evaluation phase was a bit unclear. It was also difficult to differentiate an evaluation of the study and the evaluation study. Some respondents thought that examinees do not get any chance to evaluate the final report. Their values cannot therefore come up in this phase at all. Some respondents proposed that the draft of the research report should be given to the subjects for evaluation. This can offer both an opportunity and a threat, e.g. an opportunity to perform another study, for example, to realize a certain change, because the examinees' values seem to be encouraging. The threat is that the examinees refuse the results, or one group of the examinees can evaluate and see the results in the positive light and another group in the negative light.

9. The third party's values in the evaluation phase. The financing body can evaluate whether the study produces the "good will" and enough publicity. The financing body might also require a chance to perform the pre-check of the draft and realize a censorship. In the extreme case this can lead to rejection of the

study. Does the new innovation or artifact cause benefits or troubles for its sponsor?

It is possible to evaluate whether the values of managers influenced on the examinees' responses or not.

The scientific community can evaluate whether the chosen method was the most appropriate one, and whether it was correctly applied to.

The tentative model

The responses above give so versatile view on research of values that we decided to model the problem domain. Because the borderlines between the three phases of the research process were a bit obscure, we ignore them and concentrate on a researcher, examinees and third parties, and their "components" and interrelationships (Figure 3)

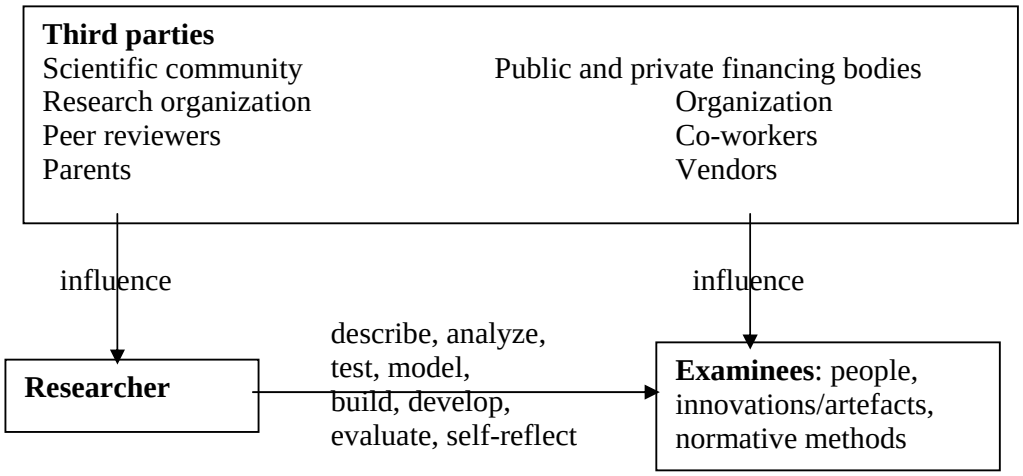

Figure 3. The tentative research model on values in the information systems

The public and private financing bodies, scientific community, research organization, peer reviewers and parents as some members of third parties have influence on researcher's work. The public and private financing bodies and vendors (mainly indirectly), the organization where examinees work and their co-workers (mainly directly) have influence on the values the examinees under study have. The researcher can study the people's values, values behind of the innovation or artifact, and values behind of the normative method developed. The researcher can in her study analyze and describe values of the research object.

She can test whether a certain theory get confirmation or not, or she can create a new tentative theory. She can also try to build a new innovation or artifact and/or evaluate such one, and the values play a central role both in building and evaluation activities. She can also before publication self-reflect her study and its results.

Discussion

In this section we shall first consider the implications of our results to science. Thereafter we pay attention to the limitations of this study. Finally we try to give some practical and research recommendations.

Scientific implications

In this sub-section we shall present a) *new findings* and b) relate our other results to the earlier literature by giving both supporting and conflicting evidence. Our tentative research model is new and it has some innovative aspects. To our mind, the explicit view that the values play the central role in all the *design science studies* is new. We claim this, because Hevner et al. (2004) did not express it explicitly but implicitly by saying that the business needs are behind of the new relevant technical artifact. There are different bodies initiating the innovation building. Hevner et al. show the customers who finance the building process. Van Aken (2004) emphasizes the researcher's role as the primary inventor of the new design outcome. Some of our informants paid attention to the role of the public financing body as the initiator of the new prototypes.

According to Baskerville and Wood-Harper (1998) Rapoport (1970) first explained three dilemmas that severely inhibit the ethical use of action research in practice. These include a goal dilemma between the practical problem-at-hand and the research question, bringing an ethical conflict to the research because this dual-goal environment sometimes conflicts. There is also a second dilemma between the roles of researcher and consultant in which one individual must serve. Sometimes these roles conflict, for example, when consulting fees are paid to the researcher or editorial control over research reports passes to the client. A third ethical conflict is found in the concomitant value dilemma. The values that inhabit the client culture may conflict with those of the researcher. Some of our findings support the views above.

For the latter case Davison et al. (2004) demand that because canonical action research is a co-operative and collaborative process, a 'lapse into individualism is to destroy the critical dynamic of the group'. Thus, the researcher must account for the values, beliefs and intentions of the client employees, and treat them as collaborators rather than mere research objects. Avison et al. (1999) support the claim by saying that canonical action research involves the combination of theory

and practice ‘through change and reflection in an immediate problematic situation within a mutually acceptable ethical framework’. The similar aspects were supported in our set of observations.

One finding was that “the legitimized organizational culture may restrict the way how the study is performed”. Denison’s (1990) model on organizational culture consists of four hypotheses. One of them is the consistency hypothesis: organizational effectiveness is a function of the degree to which the organization’s members understand and hold a shared system of beliefs, values, and symbols. Denison clearly argues that values play a central role in an organizational culture, and it is parallel with our findings above.

Our finding that “the financing body might also require a chance to perform the pre-check of the draft and realize a censorship” is parallel with Davison et al. (2004). They recommend that the detailed agreement between the researcher and the client must be prepared. The level of editorial control that the client may wish to exert over report writing, including delayed release dates and protection from disclosure of confidential information, should be addressed ahead of time. Davison et al. also recommend that before withdrawing entirely, the researcher should make a final commitment to the ethical guarantees exchanged with the client by asking them to review the content of any written reports that are intended for publication.

We found that “the artifact under study can be value-laden. In the building activity the researcher’s values can differ from the customer’s values, in the evaluation activity the researcher’s values can differ from the artifact’s values.” It is in concordance with Orlikowski and Iacono (2001) in their first premise for theorizing about IT artifact, they wrote: “Because IT artifacts are designed, constructed, and used by people, they are shaped by the interests, values, and assumptions of a wide variety of communities of developers, investors, users, etc.”

According to Baskerville and Wood-Harper (1998) “organizational development implies the development of social conditions of the organization. These conditions may include higher morale, structural efficiency, structural effectiveness or better information flows.” Nobody of the informants did not mention the values as an object to be developed, i.e. ‘higher morale’ above.

Bowker (1997) argued “that there may indeed be good organizational reasons for forgetting”. He continued that then “classification systems which are created permit the organization to move from heterogeneous forms of memory operating within multiple frameworks to the privileging of a form of memory (potential memory) operating within a well-defined information infrastructure subtended by classification systems”. He demonstrated that “in this process, the decision of whether to opt in to an infrastructure, with its attendant memory frames and modes of forgetting, or to stay out of it, is of great political and ethical import.”

Bowker’s merit is to pay attention to values and goals of the new system under construction. Depending on the classification systems used the new system can remember some states and events and forget the other ones.

Limitations

We gave the draft of our report to the respondents to confirm that we interpreted and classified their responses correctly. All sent the positive feedback back, i.e. our interpretations were correct and all the variations of the informants’ replies were included into our analysis.

To the low response rate can be paid attention. But in the phenomenographic content study the high response rate is not so important, but the saturation level achieved. Sandberg (2000) referred to Alexandersson's survey (1994) on more than 500 phenomenographic studies when he estimated that the variation of a phenomenon reached saturation at around 20 research participants. Our number of informants (15) is close to that figure, and we could clearly observe that the saturation took place in our study.

Our set of informants, the PhD students and junior doctors, can be criticized to be skewed. But to our mind it is suitable for this exploratory type study, because as young scientists they are carefully thinking about all the aspects of their studies. About a half of our informants come from industry and they can therefore take different views into account.

The set of questions was not the best possible. The informants had difficulties to differentiate, on the one hand, the design and implementation phases especially with examinees and third parties, and the implementation and evaluation phases with the researcher.

We must also ask how much the advisor as the researcher influenced on the doctoral students as informants, and in which way?

For the respondents it was difficult to separate the positive aspects from the normative ones.

According to Vaishnavi and Kuechler (2004), a certain part of philosophy, axiology, is the study of values: what values does an individual or group hold and why? We here studied the former only but not the latter.

All these limitations encourage the scholars to continue studies on this topic.

Practical implications

To our mind, the responses given by our informants and presented above give many aspects to be taken into account. Researchers, examinees and many ‘third parties’ have their own recommendations. Concerning bout senior and junior researchers our results give much for thinking. Values must always be taken into account in our studies in many different roles.

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Appendix

This questionnaire concerns values in the information systems science. *Values* put states of affairs into the priority order or into the order of importance. People have values; in this context we are especially interested in researchers', examinees' and third parties' values. The study process can be divided into three phases: design, implementation and evaluation, and we are interested in values of those three groups of people in each phase. We wish that you would have time think and write down your views on values.

The design phase of a study

How could the researcher's values come up in the design of a study?

How could the examinees' values come up in the design of a study?

How could the third party's values come up in the design of a study? (Tell about which third party you are writing)

The implementation phase of a study

How could the researcher's values come up in the implementation of a study?

How could the examinees' values come up in the implementation of a study?

How could the third party's values come up in the implementation of a study? (Tell about which third party you are writing)

The evaluation phase of a study

How could the researcher's values come up in the evaluation of a study?

How could the examinees' values come up in the evaluation of a study?

How could the third party's values come up in the evaluation of a study? (Tell about which third party you are writing)