CRITICALLY SYSTEMIC DISCOURSE

A DISCURSIVE APPROACH TO REFLECTIVE PRACTICE IN ISD (PART 2)

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ABSTRACT

The first part presented a philosophical staircase that can guide IS practitioners in identifying the various validity claims raised by any project of information systems definition, design, and development (ISD). It was concluded that the discursive principle is constitutive of every step in this staircase but requires pragmatization. The present second part of the paper begins with a short review of the way in which the discursive principle has been considered in the ISD literature thus far. It then introduces the second main pillar of the suggested approach to reflective practice in ISD, critically systemic discourse. *The methodological core concept of critically systemic discourse is* boundary critique, *a concept based in the author's work on critical systems heuristics and critical systems thinking. Based on this core concept and a practical application, a three-stage model for reflective practice in ISD is suggested.*

6   THE DISCURSIVE PRINCIPLE IN THE ISD LITERATURE

Despite the constitutive character of the discursive principle for the validity claims involved in ISD, relatively few authors have systematically considered its implications for the design and use of information systems. On the other hand, I find it interesting and encouraging indeed that those attempts of which I am aware have come to conclusions that I can easily relate to a discursive understanding of our philosophical staircase as I have suggested it in the last Section of Part 2. I would like to refer the reader particularly to three contributions by Lyytinen and Hirschheim (1986), Nissen (1989), and

Hirschheim, Klein and Lyytinen (1996). A brief review of these contributions in the light of the present paper appears useful to further illustrate its implications and hopefully to concretize some of the challenges on the way ahead.

Lyytinen and Hirschheim (1986): "IS as rational discourse." These two authors were among the first to analyze the use of information systems in the light of Habermas' theory of communicative action. This effort made them recognize that the prevailing description of information systems in technical terms tends to prevent us from fully appreciating their social nature. They refer to communicative practices in organizations which "impose constraints on people's

behavior but which can also be transformed by knowledgeable social actors" (1986, p. 20). The formal and institutionalized nature of IS creates obstacles to such transformations (an observation that fits in nicely with the example of hospital information systems considered at the end of Part 1) Lyytinen and Hirschheim are equally concerned about the fact that "information systems cannot be dissociated from social power as a capacity for getting things done." (1986, p. 23) As a consequence of these circumstances they diagnose serious "barriers to the use of IS as a discourse" (1988, p. 23f):

> *The formal nature of communication via an information system ... does not fulfill one of the ground rules for a discourse: the chance to express opinions through argumentation. The institutionalization denies another rule (full symmetry in participation). Finally, the use of IS in organizations does not usually test participants' opinions as discourse does (except perhaps teleconferencing). Instead, information systems compel their users to act, thus producing particular social relations across time and space. (Lyytinen and Hirschheim 1988, p. 24)*

In these barriers they suspect the reason why hardly any IS definition thus far has been based on a discursive concept of action. I understand their paper as an effort to demonstrate how the use of information systems can overcome these barriers. Basically, the authors see two possibilities (1986, p. 24f, italics are mine): IS can serve as "a means *of* discourse," that is, provide by themselves discursive opportunities; or IS can be of "use *in* discourse," that is, serve as a means *for* supporting discourses that are going on in their environment independently of their existence.

Information systems may *provide* discursive opportunities in three ways (1988, p. 24f):

1. They can establish new channels of communication among people across conventional hierarchic and spatial barriers.

2. They can render social relationships among those involved more symmetrical, thereby redistributing the social or

organizational positions and skills that provide access to information and also allow those who have access to question the rationality of prevailing interpretations.

3. They can produce new information that calls for a critical review of dominant practices and policies and for validating the underlying organizational or social norms and values; at the same time, such new information can support local discourses within the organizational or social environment concerned in criticizing and transforming the practices in question.

Information systems may *support* ongoing discourses in two ways (1988, pp. 25-27):

1. The may provide information that can be used as data (in Toulmin's sense of evidence) or warrant to support argumentation. (The reader may wish to add backings, too.)

2. As an indirect consequence of learning to use information systems according to Toulmin's structure of argumentation, users may also begin to understand information in terms of speech act theory (as communicative or discursive action) rather than in the usual information-theoretic terms (as a reduction of uncertainty) and consequently improve their communicative practices.

In conclusion, Lyytinen and Hirschheim (1988, p. 28) postulate that ISD should give more attention to three implications of seeing information systems as related to discourse:

(i) Information systems should facilitate discursive action by the users.

(ii) ISD methodologies should provide "institutional arrangements that approximate the ground rules of rational discourse." (It remains unclear whether they mean to request this for ISD methodologies only or also for the resulting IS.)

(iii) The implementation of information systems and their acceptance by the users

should be seen as an issue of creating legitimacy with respect to the four validity claims involved, comprehensibility, truthfulness, truth, and rightness.

Nissen (1989): ISD for responsible actors. Nissen's basic concern is that IS users should "understand how others try to influence them through this medium," and his central question therefore is: "How can information systems be developed supporting responsible action?" (1989, p. 99) Actors act responsibly, according to Nissen, if they consider the way an action may affect other people and also question its underpinning notion of human progress. Nissen speaks of *actors* rather than "users" to emphasize the irreducible autonomy and responsibility of IS users with respect to their use of "information." For instance, acting rather than merely using an IS implies some responsibility of informing oneself and learning not only through the institutionalized IS itself but also through self-selected sources, in particular through direct interaction with people who can offer alternative and independent information. This is so important because IS ought to be looked at as representing "a special case of institutionalized argumentation" (1989, p. 101): they have been modeled so as to influence users in their ways of handling a certain context of decision-making and argumentation, typically a context related to work in an organization. *Computerized* information systems try to achieve this by means of embedded data-processing systems; Nissen calls them "data systems" as distinguished from "information systems." Data systems "represent an extreme form of institutionalization" (1989, p. 107), for they need to model both the argumentation structure and the context of interest in a way that is "closed." (1989, p. 111) That is to say, the system is insensitive to a broader social and historical context of action and to the ways in which this context may evolve over time; it can acquire no additional knowledge of the context and of the sources of evidence, warrants, and backings or of possible rebuttals but must take all this for granted. Furthermore, the rigid deductive-logical and numerical argumentation structure built into data systems does not exhaust all forms of relevant and sensible human argumentation, as it has no

way of assessing arguments or actions in terms of values (1989, p. 104). The "argumentation metaphor" thus points to a fundamental difference between data systems and information systems, one that no development of data-processing methods and technology will ever eliminate (1989, p. 106f). Accordingly, Nissen concludes,

> *No attempts should be made to substitute an information system 100 per cent by data systems. This would deprive actors and people affected of checking the claims produced and thereby of their rights to act responsibly. Further large parts of the data systems would have to be designed to meet very infrequent events. (1989, p. 107)*

In order to *demystify* the way information systems work, Nissen translates his argumentation metaphor into a simple graphic "argumentation model" for IS use and development. The graphic shows data systems as an embedded part of an information system and this as an embedded part of "work in a field of action," which I understand as an organizational context of work and interaction. All three systems depend for their functioning on the action and interaction of people (informers and actors). Interaction of responsible actors always implies the use of information and argumentation in a way that is independent of the institutionalized systems; the structure of argumentation is understood according to Toulmin's (1962) model. The three systems differ in the way the underpinning argumentative structure is built into them; while in data systems it is rigid and closed, in information systems – properly seen in their organizational context of work and interaction – it is open in the sense that

> *Actors, their informers, and people affected will always have to argue with each other outside all data systems available for this purpose. New methods and technology only move the boundary between data systems and other parts of an information system, never eliminate them. (1989, p. 107).*

Likewise, all conceivable developments of information systems can only expand the boundary between the institutionalized system and the field of action of which it is a part; they should never make us forget this boundary. Nor should they make IS designers

assume the main problem is to redesign embedded data systems so as to extend their range of application: "Learning and re-socialization dominates the evolution of these other parts, not redesign of data system." (1989, p. 107).

Responsible actors will therefore *never* exclusively rely on this institutionalized form of argumentation; to the extent they do rely on it, they will demand the best evidence, warrant and backing for an "information" before accepting it as a valid claim for action. That means for IS designers and developers that a good information system should help actors to assess and question this implicit claim for action in every concrete application, for instance by suggesting context-related questions, by qualifying the validity of information with respect to their suggested argumentative force (qualifying expressions for data and warrants), or by offering conceivable rebuttals in the form of counter-evidence or alternative warrants and backings that might capture aspects of the specific context (1989, p. 107 and p.110).

Much better than working toward the mistaken ideal of substituting an information system by automated data systems – an ideal that means to "deprive actors and people affected of [the possibility of] checking the claims produced and thereby of their rights to act responsibly" – ISD should seek to "exploit the interactiveness of today's computers"; this promises to be "not only more ethical but also more profitable" (1989, p. 107). Since responsible action involves resolving conflicts, ISD should learn to conceive of IS as "judgment based information systems, i.e., information systems in which there are actors striving to act responsibly." (1989, p. 110). Finally, the model implies that the process of IS development itself "could be looked upon as a discourse about how the current way of institutionalized argumentation may be redesigned" (1989, p. 105).

Hirschheim, Klein and Lyytinen (1996): ISD as "rational argumentation design" and "institutional democracy design." This paper offers a comprehensive review of the diversity of IS development strategies that one can find in different schools of IS research as seen through an action-theoretic framework which, the authors claim, explains the "intellectual structures of ISD" and offers a pluralist conception of IS as an academic discipline (1996, p. 4). Based on Habermas' (1984) theory of communicative action as well as Etzioni's (1968) social theory, the authors devise a classification scheme for interpreting and relating the many different research orientations in the field. They follow (more or less) Habermas in distinguishing between four *orientations in ISD change* through which systems developers can approach ISD: an instrumental, strategic, communicative or discursive orientation. The first two orientations look at IS primarily as a means of "control"; the third orientation looks at IS as a means for creating shared meanings through "sense-making," and the fourth as a means for clarifying or justifying claims through "argumentation." (1996, pp. 10-12)

The authors then follow Etzioni in distinguishing between three principal *domains of ISD change* on which IS researchers may focus: "technology," "language," or "organization." The first domain focuses on hard- and software development and considers the fact that new technology is often the driving force in IS change. The second domain focuses on the fact that IS influence, and are influenced by, patterns of "socially organized human behavior" such as work arrangements and procedures, roles and positions of actors. The third domain, finally, focuses on the fact that IS define forms and contents of communication in organizations and hence, chances for reaching common understanding about conditions and goals of action. (1996, pp. 12-16)

The two dimensions combine to a grid of twelve classes or "change frames" for ISD. Three of these are vacant since a focus on technology as the primary domain of change combines with an instrumental action orientation only; the other two domains of change combine with each of the four action orientations. The framework thus serves to identify nine development strategies (1996, p. 17f). I will limit my account to the discursive orientation. Combined with a focus on language (speech acts) as the primary domain of change, it yields an IS development strategy

called "systems for rational argumentation" or *rational argumentation design;* combined with a focus on organization as domain of change, it yields a strategy called "systems for institutionalized checks and balances" or *institutional democracy design* (1996, p. 17).

Designing systems for rational argumentation is a strategy that once again draws on Toulmin's pragmatic logic of argumentation and tries to design information systems so that they do justice to it and consequently can support rational argumentation by users:

- The basic idea is *warrant design* (1996, p. 41), a concern that has received increasing attention since Churchman's (1971) seminal discussion of the problem of how an information system can guarantee the validity of its results. Ideally the system design would include all the warrants (inference rules and backings) needed for deriving the results from some evidence (data). However, at latest since Churchman has analyzed the problem in the light of alternative theories of knowledge, we know there is no epistemological basis for complete warrant design – no conceivable design for an information system can serve as its own guarantor (Ulrich 1985, p. 874).

- To the extent that warrant design must remain incomplete, the next best option is building in some *cross checking ability* (1996, p. 21). Once again the basic idea is that the system should allow users to understand and assess the information it provides by disclosing both the evidence and the warrants it uses. This puts users in a situation where they can either feed in independent evidence or modify the logic by changing warrants. The main approach is thus (in my own terms) to promote *independent* argumentation by system users through a *meta-level* discursive process, or in the terms of the authors, "to design systems that generate information to directly support the structure of arguments and counter arguments." (1996, p. 41) A complementary ideal is seen by the authors in Goldkuhl's (1991)

requirement of *transparency* for design decisions in the ISD process.

- A third basic idea proposed by the authors is a *critical audit* approach of IS designers with respect to all validity claims implied by a specific system design, particularly concerning the trustworthiness of the system's internal design and operations (1996, p. 39f).

- Finally, the authors recognize that this development strategy of *rational argumentation design* implies renouncing the idea that knowledge can be adequately represented by formal structures of predicate logic or some other "mono-logical" structure (1996, p. 42).

Designing systems for institutionalized checks and balances, the second strategy for pursuing a discursive orientation, goes beyond rational argumentation design in that it considers the distorting effects of hierarchy and other sources of asymmetries of influence and power in organizations. It is therefore oriented to eliminating or neutralizing such effects through institutionalized checks and balances. It sees information systems as vehicles for improving organizational or social conditions for rational argumentation:

- The basic idea is to design information systems so that they help to foster and sustain a *competitive market of ideas*. Two possible metaphors for conceiving of this idea are IS as "public media" that provide for openness and diversity of information, along with principles of free speech and equal access; or IS as a "court of justice" which allows different actors to argue their case with opposing evidence. (1996, p. 21)

- ISD might aim "to introduce channels for cross-checking data and claims, introduce checks and balances against subconscious bias and self-deception, and to reduce defensiveness and other psychological barriers to free inquiry, e.g. double-loop learning" (1996, p. 42, with reference to Argyris and Schön 1978). Such measures are intended to help approximate, however imperfectly, the presuppositions of an *ideal speech situation*.

- Ideas such as "due process," equal availability of information, equal obligation and opportunity to defend one's argument, peer review, independent outside reviews, transparency of normative issues, widest possible debate of issues including stakeholder involvement and (where indicated) citizen participation, as well as a strong role of the public media, are among the ideas further mentioned by the authors in this context; the common concern is to enable and support critical thinking. (1996, p. 25 and 42f).

- Finally, the authors also refer to my own critical systems heuristics and its "evaluation of boundary judgments (i.e. how to identify and design for the 'limits' of the design)" as a strategy for institutional democracy design (1996, p. 43). This conforms to the basic emancipatory concern of my approach in promoting more "symmetry of critical competence" among social actors (see, e.g., Ulrich 1993, p. 604f, and 2000a, p. 259); however, classifying critical heuristics as an approach to institutional democracy design risks creating a misunderstanding concerning its aims. I would like to point out that critical heuristics aims to promote chances for mutual understanding and compelling argumentation in general, on the part of citizens as much as professionals, by opening up potentials of cogent critique with respect to both the theoretical and the practical dimension of reason, in a way that does not depend on any specific expertise nor specific institutional requirements. Insofar I would say that critical heuristics is as much a conceptual tool for "rational argumentation design" as for "institutional democracy design." The remainder of the present paper will be dedicated to an outline and illustration of this approach. I would like to explore its potential of supporting critical reflection and discourse about the design and use of information systems along the lines of our philosophical staircase.

Conclusion. In my judgment, we can hardly overestimate the importance of the discursive principle for the future of ISD. The idea that information systems represent a kind of "frozen" argumentative structure that users as well as other concerned parties need to "unfreeze" to make proper use of them, is compelling and can inspire new directions of IS research. Yet, the fact is that progress along these lines has been slow and (as far as I can see) has remained a rather marginal concern of IS professionals. One major reason that I see is that the correspondence theory of truth, according to which proper information and valid knowledge is "what corresponds to the facts," is still so firmly entrenched among professionals as well as lay people. A second, related reason may be that the idea of discursive rationality – discursive examination of validity claims – is still relatively new and will take time to overcome the prevailing confusion of applied science with practical rationality. However, I suspect that the most serious difficulty is the "utopian" character of the discursive principle. Discourse, as we have seen, can establish claims to relevant information, valid knowledge, and rational action only under ideal conditions, and even then only if it can continue until consensus is reached by no other means than argumentation. The discursive principle of validation is an ideal, no less than any other approach to rational practice.

The conclusion is inevitable: if the discursive principle is to gain a major role, it can only be if we succeed in pragmatizing it in a critically tenable way. This is the aim of the *critical turn*[1] that I advocate. Applied to the discursive principle, it means that we might do well to understand discourse as a means of critique only, rather than understanding it as a device that aims at validation. This does not throw the ideal of sufficient justification over board but rather understands it as a critical principle only, a principle that requires a systematic effort of uncovering the inevitable justification deficits of all ISD practice. Let us then turn to this issue of a critical turn of our understanding of discursive practice and see in what way it may help us in promoting reflective practice in ISD.

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[1] Compare note 1 and 4 in Part 1 (pp. 55 and 74).

7 CRITICALLY SYSTEMIC DISCOURSE: TOWARD REFLECTIVE PRACTICE IN ISD

Barriers to rational discourse. The basic idea of our approach to promoting reflective practice in the design and use of IS should be clear: designing, using and developing information systems entails a multitude of assumptions[2] and corresponding validity claims. The *philosophical staircase* represents an attempt to arrange these assumptions and claims according to nine fundamental issues. It offers a systematic order for examining these issues, in the sense that each subsequent step presupposes all previous steps. Sometimes a step will raise questions that prompt us to go back to previous steps and review pertinent assumptions, but basically the staircase guides us in proceeding from the lowest to the highest step. The methodological device for taking each step is *discourse*. Each step requires a discursive

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[2] By *assumptions*, I mean any kind of presuppositions that underlie a concrete systems definition or design, whether deliberately so or not. In particular, they include not only *empirical* assumptions regarding relevant circumstances ("facts", "evidence" to be considered or left out) but also *normative* assumptions regarding appropriate value judgements (norms; on the meaning of "normative" and "norms," compare note 2 in Part 1, p.62). Assumptions can be either implicit (tacit) or explicit (overtly declared). Explicit assumptions are more conducive to reflective practice than implicit ones, as they can be reflected and challenged by all parties concerned. Implicit assumptions can be made in three ways: (a) unintentionally, as they are not seen by those making them; (b) consciously but in an unreflecting way, as they are taken for granted; or (c) consciously and deliberately, as the ones making them are not interested in disclosing them. Critical reflection and discourse aim first, at uncovering (making explicit) implicit assumptions; second, at unfolding the selectivity of all explicit assumptions with regard to the facts and values they exclude from consideration; third, at clarifying the implications and practical consequences they may have for the different parties concerned; and fourth, at examining or challenging the validity claims linked to these assumptions in the light of the previous three requirements.

effort of uncovering and examining the assumptions and claims involved. In order to deal systematically with the presuppositions and implications of specific information system designs, we can thus climb the stairs step by step, reflecting on the assumptions we want to rely on and the validity claims they imply, and then submitting the answers to discursive validation by all parties concerned.

However, a crucial methodological problem remains. We have noted earlier (in Section 3) three fundamental barriers to achieving complete rationality in discourses about validity claims: First, *consensus* is a scarce resource. Second, where consensus on assumptions is effectively reached, it validates these assumptions only to the extent that we can assume that an *ideal speech situation* has been approximated. Third, even where this is feasible to a credible extent, there remains the fundamental *problem of boundary judgments*. Let me now turn to this much-neglected yet crucial problem.

The problem of boundary judgments. No argument can be completely rational in the sense of justifying all the assumptions on which it depends as well as all the consequences it may have. What ought to count as knowledge, that is, as relevant circumstances, "facts" and "evidence" that should be considered? And what counts as relevant concerns, that is, value judgments concerning purposes, measures of success and other criteria of evaluation ("norms")? *Whose* facts and *whose* concerns should they represent? Ultimately, there is no single right way to decide such questions. Yet at some point argumentation has to end and practical action has to begin. *Boundary judgments* define the boundaries of argumentation in two interdependent ways: First, they delimit the reference system that is considered relevant, that is, the context that matters when it comes to assessing the merits and defects of a claim. In other words, they define 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 or who, if not involved, are (should be)

considered legitimate stakeholders. For instance, what are the concerns that should make up our notion of "improvement" for redesigning and developing an existing IS, *whose* concerns are they? Those parties whose concerns define our standards of improvement belong to the reference system in question. Boundary judgments thus define what knowledge is relevant and what concerns matter.

Second, it follows that the boundary judgments in question also define the range of valid application of the arguments they underpin. In the example, this would be the precise context of implementation and use for which the redesigned IS can claim to bring an improvement. However, intentions (validity claims) and actual achievements are not always the same. It is thus always meaningful and relevant to question the effective reference system for which a proposal is valid. Not only conscious decisions to treat some aspect of a problem situation as not belonging to the relevant context can and need to be interpreted in terms of boundary judgments; rather, *any* deficit of argumentation amounts to a boundary judgment. For even if we are perfectly willing to consider some aspect as part of the problem, but then for whatever reasons (e.g., lack of information, failures of communication, errors of analysis or argumentation) fail to consider it adequately, we have effectively excluded this aspect from our reference system.

I use the term "boundary judgments" rather than "boundaries" to emphasize the judgmental nature of boundary issues, for they depend on assumptions of facts and values that can always be questioned – there are no objectively right or necessary ways to bound the relevant context. I will discuss the specific nature of the boundary issues in question in a moment; at this point it is sufficient to note that I am talking of multiple conceptual systems boundaries rather than of a single physical boundary.

It is hardly exaggerated to say that everything that really matters in an ISD project – what kind of "information" and "knowledge" it is to provide for whom, in what context of application, for what purposes and with a view

to what kind of improvement – is heavily dependent on boundary judgments. No effort to argue comprehensively, as meaningful as it may be, should make us forget that all argumentation, all practice of applied science and systems design, is selective in the sense of depending on boundary judgments. The basic implication is that we can never be sure of having considered all possibly relevant facts and normative considerations – one reason why warrant design is such a difficult undertaking. A second implication is that all our claims are bound to be "partial" in the sense of not doing equal justice to all concerns. Reflective professional practice must face these implications. No amount of science and expertise can circumvent the problem of boundary judgments.

Critical Systems Heuristics. In my work on *critical systems heuristics* (CSH), or more accurately, critical heuristics of social systems design (see, e.g., Ulrich 1983, 1987a, 1993, 1996, 2000a, 2002a, b, and c), I have sought to develop a discursive framework that does justice to the problem of boundary judgments and uses it as the starting point for a critical systems approach to applied science, systems design, and reflective practice in general. Such a framework needs to meet two basic requirements. First, it needs to clarify the theoretical basis of a critical approach by grounding it in semiotics, epistemology, and practical philosophy. To this end, CSH relies on ideas similar to the ones suggested in the present paper but elaborates the philosophical issues involved in much more detail, drawing particularly on the writings of Kant (1781), Peirce (1878), Popper (1959, 1963), Apel (1980, 1981), Habermas (1979, 1984), and Churchman (1971, 1979). Second, it needs to translate this philosophical grounding into a pragmatic (in the everyday sense of the term) framework for reflective discursive practice. CSH finds the key to this in a new, critical understanding of the systems idea and in a related attempt to secure a critical handling of boundary judgments. The crucial idea consists in a systematic process of *boundary critique;* I will therefore begin my introduction to critical heuristics with this idea.

Systematic boundary critique. Boundary critique is the methodological core

concept of critical systems heuristics. Increasingly, it is also recognized as a central concept of critical systems thinking and of critical professional practice in general. Boundary critique is a discursive process of surfacing boundary judgments, unfolding their implications, and examining the ways they condition validity claims. This is what I call boundary critique.

Let us be sure, then, that we understand the fundamental nature and role of boundary judgments. The first thing to understand is why they are so fundamental. As my introductory explanation should have made clear, from a critical point of view the question is not *whether* we rely on boundary judgments but only *how* we handle them. Conventional systems thinking may be understood as an effort to expand our reference systems so that ideally we might claim that we consider "the whole relevant system" (Churchman 1971, p. 8). Unfortunately, this sort of comprehensiveness is a claim reserved to heroes and gods. From a critical point of view,

systems thinking cannot alter the fact that all our claims remain selective in the double sense explained above, of being *selective* with respect to relevant facts and norms and *partial* in the sense of benefiting some parties more than others. Boundary critique aims at disclosing this inevitable selectivity and partiality.

How boundary judgments work. The second essential point we need to understand is how boundary judgments work. How exactly do they condition our reference system and the claims that may depend on it? CSH explains this by means of the *eternal triangle* of reference system, facts, and values: Whenever we propose a problem definition or solution, we cannot help but assert the relevance of some facts and norms as distinguished from others. Which facts and norms we should consider depends on how we bound the reference system, and vice-versa; as soon as we modify our boundary judgments, relevant facts and norms are likely to change, too (Figure 4).
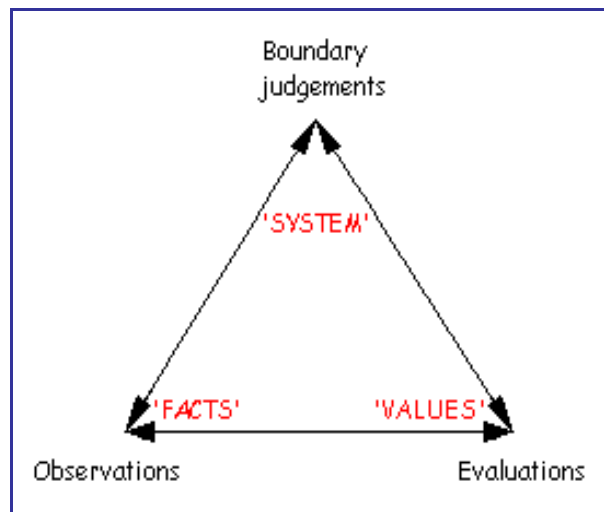

Figure 4: The "eternal triangle" of boundary judgments, observations, and evaluations
(Source: Ulrich 2000a, p. 252)

Thinking through the triangle means to consider each of its corners in the light of the other two. For example, what new facts become relevant if we expand the boundaries of the reference system or modify our value judgments? How do our valuations look if we consider new facts that refer to a modified

reference system? In what way may our reference system fail to do justice to the perspective of different stakeholder groups? Any claim that does not reflect on this "triangle" of boundary judgments, judgments of facts, and value judgments, risks claiming too much, by not disclosing its built-in

selectivity. In this way boundary judgments strongly influence the way we "see" a situation. It is thus never a bad idea to make it clear to ourselves and to others what these judgments are and how different the situation might look if we were to change them. I see much potential here for employing the systems idea in more self-critical ways than is common; in ways that truly promote self-reflection, learning, openness, and tolerance toward others. Mutual understanding need not always mean consensus; we can learn to understand our differences rationally, by appreciating one another's different reference systems and granting to each other that there is no single right set of boundary assumptions. This, it seems to me, is a definitive gain in communicative rationality, even where consensus is not available or does not live up to ideal conditions of rationality.

Boundary categories. The next point the reader will want to understand is how we

can identify boundary assumptions systematically. What types or categories of boundary issues are there, how do the boundary judgments in question look like? CSH offers a framework of twelve basic boundary categories (Figure 5). Each category stands for a type of boundary issue that unavoidably comes up in all systems design and practice. What matters is not so much the specific terms I propose for the categories but rather their intent, that is, the specific boundary issues they address. There are four groups of boundary issues. They refer to a claim's sources of motivation and purposefulness; of power and control; of knowledge and expertise; and of legitimation and normative acceptability. The first category of each group refers to a key group of actors concerned; the second to related core concerns; and the third to crucial difficulties raised by the two previous issues.
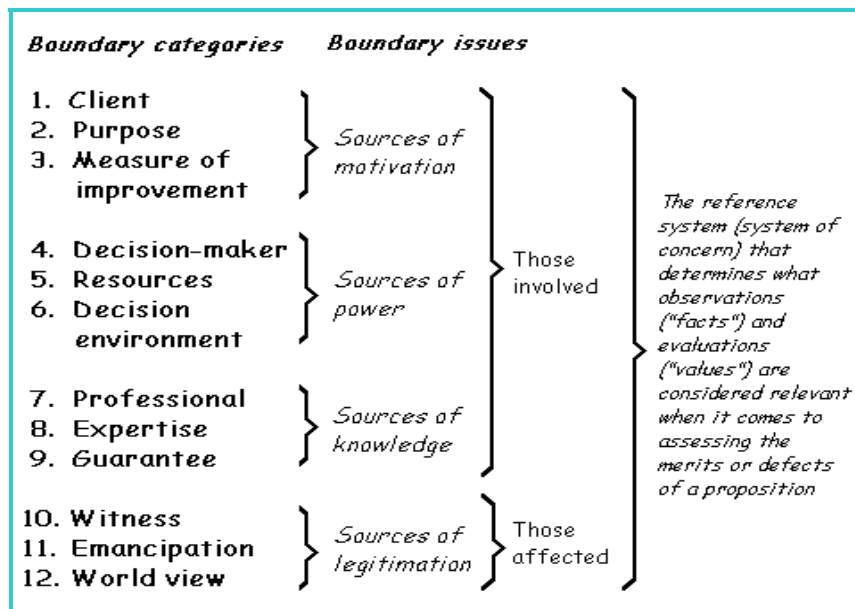

Figure 5: Boundary categories of critical systems heuristics
(Source: W. Ulrich, 1983, p. 258; 1996, p. 43; and 2000a, p. 256)

In any concrete situation, assumptions concerning these twelve boundary issues make up the reference system we use for defining "the problem" or assessing the merits and deficiencies of any proposals for "improvement" (e.g., a solution proposal,

design, evaluation, recommendation, decision, and so on). Since a claim's underpinning reference system is so fundamental to understanding its meaning and validity, we can use the twelve boundary categories as guides for reflecting about many issues that pose

themselves in ISD projects. We may use them for a general assessment of a design or project as a whole, for instance when we face conflicting expectations and concerns of the different parties involved or affected. We may equally use them as guides in dealing with particular questions that come up in a project, or we can use them to surface such questions in the first place. In all these applications, we will want to examine boundary assumptions in the light of those steps of the philosophical staircase that appear particularly relevant for clarifying the claims involved. Obviously, before we can do so we need to familiarize ourselves with the intent of the boundary categories and learn to use them for formulating relevant questions – the next step.

Boundary questions. The boundary categories can be translated into a checklist of critical boundary questions (Ulrich 1987a, 1993, 1996, 2000). I have formulated these so that they should make clear the intent of each boundary category; the second part of each question (beginning with "That is, …") gives a definition of that category. For each boundary category there are two questions, one formulated in the "is" mode (what is actually the case?), the other in the "ought" mode (what should ideally be the case?). Only by opposing "is" and "ought" answers can we fully appreciate the selectivity of the boundary judgments concerned; differences between "is" and "ought" answers (which are frequent) point to unresolved boundary issues (Table 4). I suggest we use boundary questions for three critical purposes:

- *First,* to identify and unfold systematically the boundary issues raised by a claim – What boundary judgments are actually underpinning the claim ("is" assumptions), as distinguished from those I or we (those involved) would like to rely on ("ought" assumptions)? What is their empirical and normative selectivity, *whose* concerns do they reflect?

- *Second,* to address concerns other than those privileged by the present situation – What are the boundary judgments in terms of which we can understand the concerns of different groups of stakeholders? What options are there for adapting the assumed

reference systems so as to accommodate these concerns? How different would the claim in question then look?

- *Third,* to identify and challenge in a compelling way any claims to knowledge and rationality that do not declare their underpinning boundary judgments – What boundary judgments does this claim take for granted? *Whose* concerns do these boundary judgments treat as irrelevant or marginal, and what does that tell us about the selectivity of the claims linked to them?

Emancipatory boundary critique. The last-mentioned guideline leads to an emancipatory employment of boundary critique. Lest boundary critique depend entirely on the goodwill of those involved, anyone who has understood the basic idea can also use boundary critique *against* parties who are not willing to handle their boundary judgments so self-critically. This is an important application of boundary critique; it means that unlike Habermas' ideal model of discourse, CSH does *not* depend on the anticipation of an ideal speech situation in which influence, power and skills are distributed symmetrically and all participants are willing to rely on no force but that of the stronger argument. Boundary critique puts people whose concerns have been ignored or marginalized in a situation in which they can translate their concerns into cogent critical argumentation. They can now make it apparent to everyone (also publicly) how the arguments of those in control of the situation depend on boundary judgments that have not been declared. By advancing alternative boundary judgments that may be overtly subjective, they can demonstrate that there are options, and in this way can also make apparent the intrinsic selectivity and partiality of the claims they contest. Since boundary judgments cannot be justified by reference to an advantage of theoretical expertise and knowledge, anyone can use them for critical purposes without running the risk of being convicted of insufficient expertise or competence. In this way, emancipatory boundary critique can help create a new *symmetry of critical competence* under everyday conditions of asymmetric influence and incomplete rationality.

Table 4: Boundary questions of critical systems heuristics
(Source: W. Ulrich, 1987, p. 279; 1996, pp. 24-31; and 2000a, p. 258)

Sources of Motivation

(1) Who is (ought to be) the *client?* That is, whose interests are (should be) served?

(2) What is (ought to be) the *purpose*? That is, what are (should be) the consequences?

(3) What is (ought to be) the *measure of improvement?* That is, how can (should) we determine whether and in what way the consequences, taken together, constitute an improvement?

Sources of Power

(4) Who is (ought to be) the *decision maker?* That is, who is (should be) in a position to change the measure of improvement?

(5) What *resources* are (ought to be) controlled by the decision maker? That is, what conditions of success can (should) those involved control?

(6) What conditions are (ought to be) part of the *environment?* That is, what conditions does (should) the decision maker *not* control (e.g., from the viewpoint of those not involved)?

Sources of Knowledge

(7) Who is (ought to be) involved as a **professional**? That is, who is (should be) involved as an expert, e.g., as a system designer, researcher, or consultant?

(8) What *expertise* is (ought to be) consulted? That is, what counts (should count) as relevant knowledge?

(9) What or who is (ought to be) assumed to be the *guarantor?* That is, what is (should) be considered a source of guarantee (e.g., consensus among experts, stakeholder involvement, support of decision-makers, etc.)?

Sources of Legitimation

(10) Who is (ought to be) *witness* to the interests of those affected but not involved? That is, who is (should be) treated as legitimate stakeholder, and who argues (should argue) the case of those stakeholders who cannot speak for themselves, including the handicapped, the unborn, and non-human nature?

(11) What secures (ought to secure) the *emancipation* of those affected from the premises and promises of those involved? That is, where does (should) legitimacy lie?

(12) What *world view* is (ought to be) determining? That is, what different visions of improvement are (should be) considered and somehow reconciled?

In addition to creating better argumentative chances for those who are willing to submit their claims to argumentation (as against those who are not so willing), emancipatory boundary critique also allows discourse participants to analyze their differences in terms of divergent reference systems rather than accusing one another of lacking rationality or of getting their facts or values wrong. In this way, people can at least agree about why they disagree, and can so better appreciate the different rationalities of those with whom they are at cross-purposes (*sic* – boundary category #2). I cannot explain this emancipatory side of critical systems heuristics in any more detail here but invite the reader to consult some of the original sources (Ulrich, 1983, entire Ch. 5; 1987, p. 281f; 1993, pp. 599-605; 2000a, pp. 257-260).

Contrasting two types of reference systems. CSH distinguishes between two basic reference systems that can help us grasp the intrinsic selectivity of a system design. The first is the one that actually informs the design effort of those involved; it represents their primary *system of concern* and hence, their basic context of justification. The second is a larger context that includes all the effects that a claim may possibly impose on third parties, including those stakeholders whose concerns may not be represented by the primary system of concern. CSH conceives of this larger

context as a claim's *context of application*. In order to fully appreciate the selectivity of a design, we should try to understand both reference systems. For critical purposes, it is a good idea to maintain a critical tension between them: each can help us to see the other in a critical light. Both the primary system of concern and the context of application can of course be unfolded systematically by means of the boundary categories and questions.

Critically systemic discourse. I call the suggested discursive framework *critically systemic discourse,* for it marries the ideas of critical systems thinking and discourse in a mutually supportive manner:

- On the one hand, systemic boundary critique renders critical *discourse* cogent without requiring ideal conditions of complete rationality. To the best of my knowledge, this is the only model of discourse today that achieves this. It allows discursive examination of validity claims without depending for its rationality on ideally rational consensus, that is, on a condition that in practice is illusory. Critically systemic discourse does not sacrifice rational discursive practice to such a theoretical concept of rational discourse. It renounces a one-sided focus on consensus as a source of reasonable practice in favor of a sustained effort to deal *critically* with the fact that under everyday conditions we can hardly ever assume conditions of complete rationality. The point of rational discourse is then to deal critically with conditions of incomplete rationality and *thus* to create more practical rationality, rather than presupposing it. This kind of discourse is about being (self-) critical rather than being right. This is the "critical turn" of rationality that I advocate. *Boundary discourse* is my proposal for practicing the critical turn. Insofar as it creates improved *symmetry of critical competence,* it pragmatizes the ideal speech situation in a critically tenable way.

- On the other hand, boundary discourse also operationalizes the basic idea of *critical systems thinking,* of using systems

thinking in the service of reflective practice. Note that the systems idea is similarly ideal in its quest for comprehensiveness in looking at a problem as is the idea of achieving complete justification of claims by means of discourse. Boundary critique thus not only improves chances for cogent argumentation – at least for critical purposes – under everyday conditions of imperfect rationality, it is also the only way systems thinking can be critically tenable.

In view of this double capacity of making critical discourse practicable and systems thinking critically tenable, I suggest that *boundary critique is a methodological core idea for any discursive approach to reflective practice.* Thus far, systems designers were facing an impossible choice between a discursive framework such as the one of Habermas, which is critically tenable but not practicable, or a more conventional monological framework as represented by prevailing notions of applied science and expertise (including systems science and systems methodologies), which are practicable but not critically tenable – and for this reason also fail to promote reflective practice. Critically systemic discourse offers a way out of this dilemma; its concept of rational discourse is *both* critically tenable *and* practicable. It stands for a conception of systems thinking and systems design that is fundamentally discursive and thus offers a radical alternative to the prevailing understanding of critical systems thinking in terms of informed methodology choice, an approach that I have elsewhere examined in detail and found methodologically incapable of supporting reflective practice (see Ulrich 2000b and 2002c; shorter in 2001, p.19f).

As a final comment, it is only natural that new ideas of the kind I have presented appear somewhat abstract and theoretical as long as they are not yet familiar. I can assure the reader, however, that boundary critique is anything but an abstract theoretical idea. Boundary judgments are not an exotic invention of mine; rather, they are omnipresent out there in the world of social practice. Once you have understood the concept, you will see

boundary judgments at work in your professional life every day and you will hear them playing their part in discussions everywhere, whether in the media or on the bus. People use them all the time without being aware of them and of how they condition what they say. A discursive framework such as critically systemic discourse is required to change the situation and to render the concept useful for reflective practice.

8   APPLICATION

Some recommendations. Returning at the end of this paper to the field of ISD, I would like to summarize the key ideas outlined in the paper in the form of three basic recommendation or guidelines for ISD professionals who wish to become more reflective practitioners:

1.   Conceive of reflective practice in terms of the *philosophical staircase* for ISD, that is, examine the validity claims underpinning any specific design or use of an IS by climbing the staircase step for step and reflecting on the questions each step may raise.

2.   Familiarize yourself with the idea of systematic boundary critique as it has been conceptualized and pragmatized in *critical systems heuristics.*

3.   Engage in critically systemic discourse with both colleagues involved in and stakeholders concerned by an ISD project on which you work, and start applying the idea of discursive boundary critique – of *boundary discourse* – to all or selected steps of the staircase.

For some further guidelines and an example of their application, although not to an ISD problem, see Ulrich (2000a, pp. 260-264). Some more detailed case studies from various fields of application can be found in Ulrich (1981; 1983, chapters 7 and 8); Flood & Jackson (1991); Topp (1995); Midgley et al. (1998); and Carr and Levidow (2000). Finally, some recent attempts at applying the idea of boundary critique to ISD can be found in two

papers and a forthcoming dissertation by Cordoba and collaborators (Cordoba 2002, Cordoba et al. 2000a, b)[3]. To conclude the present paper, I would like to give a short account of Cordoba's approach; I will then modify it slightly so that it can help the reader to concretize the three recommendations just given and to put them into practice.

A practical application. Cordoba starts from the observation that much of present-day IS planning is based on an instrumental and strategic kind of rationality – in his words, "technological and business driven" and focusing on increasing "maximum turnover of investments made" or providing "competitive advantage." His concern is that this sort of approach is particularly inadequate for developing countries, where IT and IS are considered as vital tools for "catching up" with other countries; being part of the global Information Society is seen as a fast track towards improvements in education, employment, social conditions of life, and democracy. However, practice does not always live up to these expectations. Cordoba refers to recent efforts in Columbia (a country whose citizen he is and with which he is therefore familiar) to establish a national plan for the use of IT and IS with a view to improving access to information and communication services for large parts of the population. He observes that two years after the plan was established, it has not been fully implemented and has achieved little progress in making information services more accessible to people. For instance, "vast rural areas still remain isolated from the rest of the country. Internet connections will only increase from 500.000 now to 1.2 millions in 2002. Plans to *massively* use IS in education [by providing schools with Internet access]

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[3]   I have some reservations about the account of my understanding of boundary critique in Cordoba et al. (2000b). This account, though partly correct, follows a number of previous misrepresentations of my work by one of Cordoba's co-authors (e.g. Midgley et al. 1998); for this reason I prefer to refer the reader to Cordoba et al. (2000a), as this papers offers a shorter but more adequate account of my ideas. For authentic recent introductions, see Ulrich (1996, 2000a, 2001, 2002a, b, c).

find resistance among teachers and educational institutions." (Cordoba et al., 2000a, p. 4).

The story certainly looks familiar to anyone who has ever participated in projects directed at improving particular social conditions and has observed how issues of social systems design are treated as mere issues of "tool design" (Ulrich 1981, p. 36, and 1983, p. 329): the myth that "better technology can help solve practical problems" is apparently immune against all practical failure (Lyytinen and Robey 1999). With this concern in mind, Cordoba turned to the idea of boundary critique as the core concept of his approach to IS planning in Columbia. He reports on an ISD project aimed at supporting teaching and research at Javeriana University in Bogotá in which he was involved. To help define IT/IS requirements in a way that should respond to the needs of staff and students, he designed the methodology summarized in Figure 6. My subsequent account follows Cordoba's (2000a) closely.
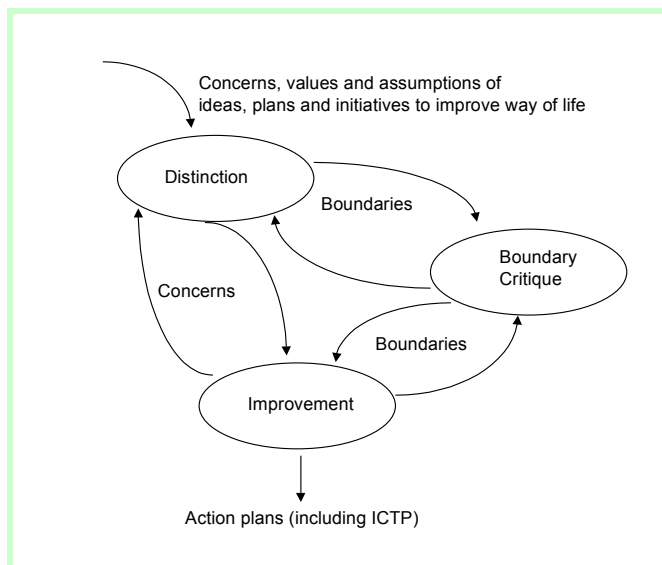

Figure 6: A discursive framework for boundary critique as used in Columbia by Cordoba et al. (2000a, b)

The methodology consisted of two stages of discourse. First, a stage of *distinction* was used to identify the different concerns of people as they voiced them. Second, a stage of *improvement* was used in which specific improvements were presented to the participants to see whether some of them captured their concerns and could be transformed into concrete action with or without IS. The conceptual link between the two stages consisted in boundary critique. The idea was to make sure no issues, people, or activities were excluded or marginalized in the process. This was achieved by applying the boundary questions of critical systems heuristics to both the concerns identified and to the proposals for improvement. Questions such as "who else should be included" or "what else should be included," specified for particular boundary categories, were driving the process of debate with the participants. Posing the questions in the "ought" as opposed to the "is" mode allowed participants to reflect on other aspects that should be addressed, beyond their original concerns. Facilitators also encouraged participants to reflect on the relevant sources of knowledge that should be used in the process, including new participants and new methodologies. In order to keep the process of pushing out the boundaries manageable, some practical limits were predefined in terms of

feasible actions within the University, financial constraints, and others. These imposed boundaries were, however, acknowledged and thus considered more consciously than they might have been without the process of boundary critique. I should mention here that my own understanding of boundary critique, including ecological and ethical boundary critique, does not imply that the process is always oriented to pushing out system boundaries; when it comes to critical systems thinking, bigger is not automatically better (see Ulrich 1993, p. 583-585; 1996, pp. 36f; 2001, p. 23).

In Cordoba's evaluation of the experience,

> *"The approach allowed the emergence of issues not addressed by traditional methodologies of IS planning. Particularly it helped to identify the assumptions that people have regarding the purpose and usefulness of IS. It also helped to identify the concerns of those who are in charge. ... Asking about concerns seems to be a useful element to facilitate inclusion of people and issues into actions. ... In this way IS planning can become a continuous dialogue in the creation of knowledge and meaning."* (Cordoba et al., 2000a, p. 7)

An improved three-stage model for critically systemic discourse. In my own evaluation, the reported application of boundary critique seems to come close in many respects to what I intend by critically systemic discourse, except that in this case the issue of uncovering the validity claims involved does not appear to have been a major concern, as of course the process was not informed by the philosophical staircase. In any case I would suggest modifying the process slightly, so as to give a systematic place to the idea of a discursive examination of *validity claims,* particularly as implied by mutual understanding on improvement. In what way are the claims to improvement selective? Following the logic of the staircase, claims to improvement might be systematically analyzed in terms of underpinning assumptions regarding "information," "knowledge," and "rationality":

1. What counts as adequate *information* and to whom is it to be provided by the information system in question? (Semiotic clarification & critique, steps 1 - 3 of the staircase)

2. How is the IS embedded in a larger context that makes sure users and other actors will be in a situation to base their actions on valid *knowledge?* (Epistemological validation & critique, steps 4-6)

3. Wherein consists the *rationality* of the practice thus supported, that is, what concept(s) of rationality and what corresponding concepts of improvement does it assume and whose rationality does it stand for? (Practical-philosophical rationalization, steps 7-9)

Systems designers and facilitators might formulate pertinent questions in the language previously used by the participants and ask them, as well as possibly third parties not previously involved, to comment on these questions before defining the basic assumptions on which the IS design is to be based.

How should the additional scrutiny be located in the process? It could be understood as an *implicit part of boundary critique,* which means criticizing validity claims in both stages according to Figure 6, or it could be assigned to an additional *third stage* that logically would have to follow the second. I think the second solution is easier to put into practice, for the following reasons.

- It does not burden the first stage of identifying the concerns of stakeholders with the more difficult issue of examining validity claims; it thus offers more flexibility for adapting the important first stage to the needs and language of the participants.

- The entire process is meant to crystallize into some proposals for action – I will call them "conclusions" – with a view to achieving improvement. It makes sense to focus the scrutiny of validity claims on the notion of "improvement" that is to guide further action. (Note that the quest for improvement is a core concept that orients CSH's categorization of boundary issues and thus its understanding of boundary critique; see, e.g.,

Ulrich 1983, pp. 236-239, 294 and 254f; 1996, pp. 7-10; and 2001, p. 8f).

- A separate third stage makes allowance for the possibility that in stage 2, no consensus on proposals for improvement is reached. The final stage can then help participants understand why this is so and

appreciate the conflicting rationalities and claims involved. On this basis of mutual understanding of differences, a new respect and tolerance can grow that may be conducive to finding some common ground for action.

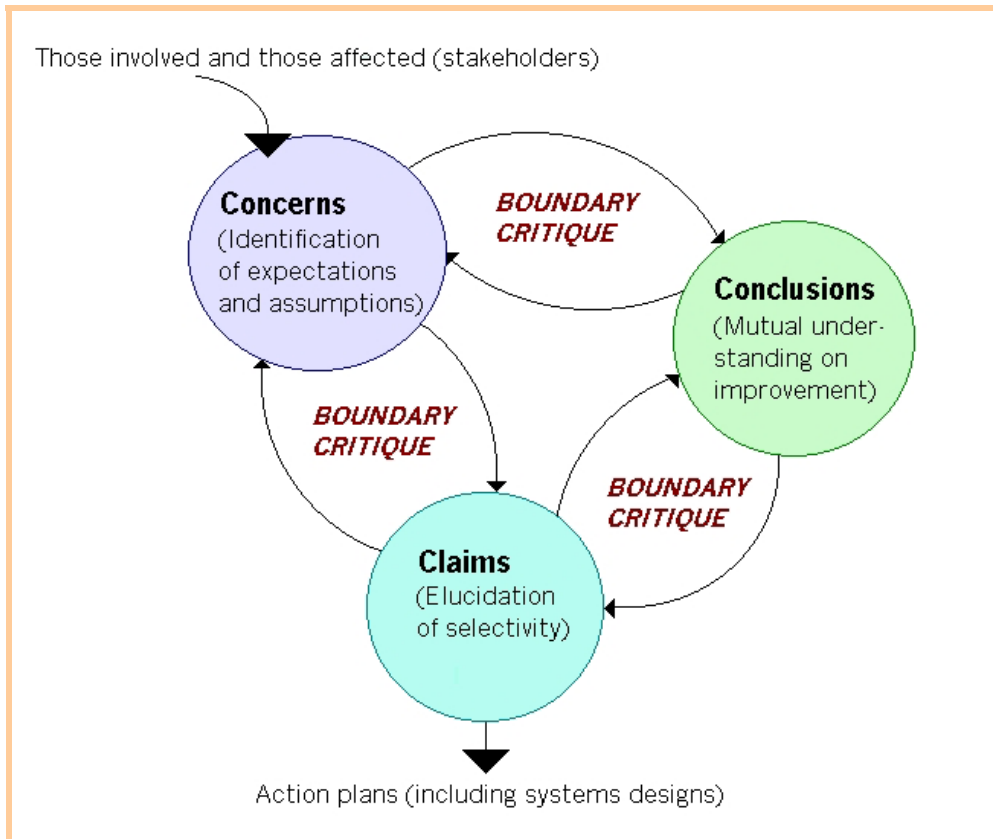The resulting three-stage model of critically systemic discourse is shown in Figure 7.

Figure 7: A three-stage model of critically systemic discourse

The description of the process of boundary discourse in terms of three stages (or two in the case of Cordoba's report) should of course be read as indicating a logical rather than a temporal order. During the entire process, participants should be allowed to reconsider the concerns they voiced originally, as well as the improvements they recognized as appropriate or refuted, particularly when it comes to unfolding the selectivity of implied validity claims. In the light of issues related to validity claims, it may well be that previously defined concerns and conclusions regarding

"improvement" need to be reconsidered. The figure makes the iterative nature of the process obvious.

As a final note concerning the implementation of critically systemic discourse, I would not exclude that it can also be usefully supported by appropriate software, and in this way could become an integral part of an interactive IS design. In this respect, I would like to refer the reader to Ivanov's pertinent, though rather preliminary, reflections on the design of computer supported learning through what he calls

"hypersystems," an interactive software application (possibly in the form of groupware) that would elicit and help to record an argumentative process structured along basic categories such as CSH's boundary categories (Forsgren and Ivanov 1990; Ivanov 1992 and 1993).

Conclusion. With this three-stage model, we have concluded the outline of a discursive approach to reflective practice in ISD that incorporates the critical turn. The approach has thus three main elements:

1. The *philosophical staircase* of ISD – a guide to identifying, and reflecting upon, the validity claims raised by a concrete ISD project (or by any specific aspect of its design).

2. *Critically systemic discourse* – a discursive framework for examining validity claims that operationalizes the methodological core concept of systematic boundary critique.

3. A *three-stage model* of critically systemic discourse – a practical way of applying boundary critique to the three issues of identifying the concerns of stakeholders; drawing conclusions concerning possible proposals for "improvement"; and examining the validity claims embodied in such proposals in terms of their empirical and normative selectivity.

I wish you good reflective practice.

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Ulrich (left) with friend Socrates

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