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January-February 2018

Reference Systems for Boundary Critique

A Postscript to «Systems Thinking as if People Mattered»

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The true system, the real system, is our present construction of systematic thought itself, rationality itself.… There's so much talk about the system. And so little understanding. (Robert M. Pirsig, Zen or the Art of Motorcycle Maintenance, 1975, p. 94)

"The system," our construction of rationality In his novel *Zen and the Art of Motorcycle Maintenance,* Pirsig (1975) explains to his son Chris what it means to maintain a motorcycle. The key is to see the technological artifacts and systems that surround us as *ideas* rather than objects. A motorcycle consists of parts made of metal, yes; but whether and how well it works depends on the understanding and care that flow into its construction and maintenance. The true system we call "motorcycle" is really a system of concepts – a mental construct – worked out in steel**:**

> That's all the motorcycle is, a system of concepts worked out in steel. There's no part in it, no shape in it, that is not out of someone's mind.… I've noticed that people who have never worked with steel have trouble seeing this – that the motorcycle is primarily a mental phenomenon. They associate metal with given shapes – pipes, rods, girders, tools, parts – all of them fixed and inviolable, and think of it as primarily physical. But the person who does machining or foundry work or forge work or welding sees "steel" as having no shape at all. Steel can be any shape you want if you are skilled enough, and any shape *but* the one you want if you are not. Shapes, like this tappet, are what you *arrive* at, what you give to the steel. Steel has no more shape than this old pile of dirt on the engine here. These shapes are all out of someone's mind. That's important to see. The *steel?* Hell, even the steel is out of someone's mind. There's no steel in nature. Anyone from the Bronze Age could have told you that. All nature has is a *potential* for steel. There's nothing else there. But what's "potential"? That's also in someone's mind!… Ghosts. (Pirsig, 1974, p. 94f)

The "ghosts" to which Pirsig refers at the end of this short extract are the *ghosts of rationality*, rationalities that we construct ourselves in our minds by the way we conceive of the "systems" that surround us – not only those worked out in steel but also the institutions and governance systems by which we run our societies. The rationality of systems lies in the minds of those who design and control them. Due to the subjective and often self-serving nature of such rationalities, they risk leading us away from true knowledge and understanding and thus also from true rationality and improvement of practice. This kind of alienation of prevalent notions of

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Note: This s a postscript to the preceding two-part essay on "Systems thinking as if people mattered" (Ulrich, 2017d, e). It takes up the notion of reference systems for boundary critique and aims to cast a little more light on the different rationalities they embody, by situating them in the author's earlier three-level concept of rational practice (Ulrich, 1988, 2001b, and 2012b).

rationality from people's experience and needs is what ordinary citizens mean when they refer to the responsible instances and administrative structures of their societies as *"the system"* – the impoverished constructions of rationality they see embodied in these instances and structures and which are not really connected with their own experiences, needs, and hopes, yet shape their everyday reality. "The true system," as Pirsig (1975, p. 94) puts it in the motto cited at the outset, "is our present construction of systematic thought itself, rationality itself."

The *reference systems* of which we speak in boundary critique are ideal-typical reconstructions of such rationality perspectives. They are "ideal-typical" in that they hardly ever occur empirically in pure form; rather, they shape real-world practice in constantly changing combinations and situational adaptations. They can help us understand the rationality perspectives that inform claims to relevant knowledge and rational action. In what ways are such claims *selective* as to the facts and values they consider relevant, and *partial* as to the parties that are likely to benefit?

Critical systems thinking Systems thinking has long assumed that taking a "systems approach" – conceiving of situations or issues in terms of relevant whole systems, with a consequent effort of *"sweeping in"* a broad range of circumstances and considerations (Singer, 1957; Churchman, 1968, 1982) – can help us avoid such selectivity and partiality and thus can secure a higher degree of rationality than conventional analytical thinking can. In practice though, the quest for comprehensiveness is bound to fail inasmuch as it finds no natural limit. It is *a meaningful effort but not an arguable claim.* Accordingly, the sweep-in principle cannot resolve or avoid the problem of the inevitable selectivity and partiality of all practical claims to relevant knowledge, rational action, and resulting improvement. Rationality and selectivity are inseparable siblings, regardless of whether we take a systems approach or not. This is why in my work on critical systems heuristics (CSH),[1)] the *principle of boundary critique* – the requirement of promoting a reflecting and transparent employment of the boundary judgments that are constitutive of our reference systems – had ultimately to replace Singer and Churchman's sweep-in principle as a methodological core principle of systemic thought and practice (Ulrich, 2004, p. 1128).

Rationality and reference systems *Critical systems thinking* begins when we first realize that our reference systems of thought and action (S) do not usually comprise all the aspects of the universe (U) that might conceivably be relevant and on which our claims may consequently depend (**Fig. 1**).

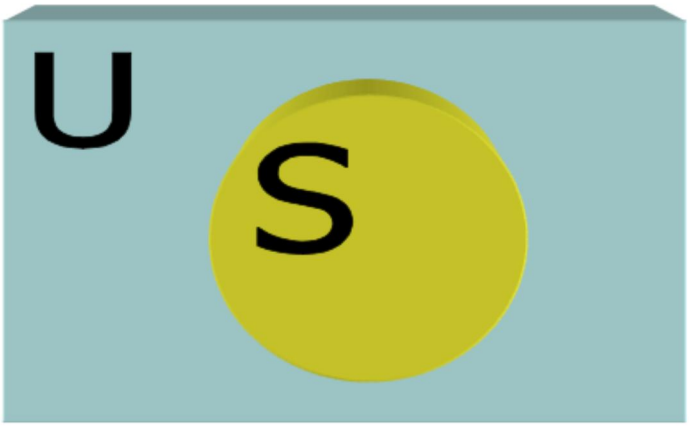

Fig. 1: R**eference system vs. universe**
U = universe; S = current reference system of thought and action. Critical systems thinking begins when we realize that our reference systems (S) for judging situations and for assessing related claims may (and as a rule, do) not comprise all the aspects (or conditions, circumstances) of the universe (U) that would allow conclusive arguments to systemic rationality.

We may refer to the unknown section of the universe that in a specific situation or issue would allow conclusive arguments to sufficient knowledge, rational action, and resulting improvement as the "relevant whole system" (W). The difficulty is, we do not *and cannot* usually know W, for it represents a totality of *conceivably* relevant conditions or of related circumstances, concerns, and ideas and as such lies beyond the reach of empirical knowledge or, in any case, beyond what from a critical point of view we should assume to know for sure. There is, in this sense, a *critical difference* between S and W (**Fig. 2**).

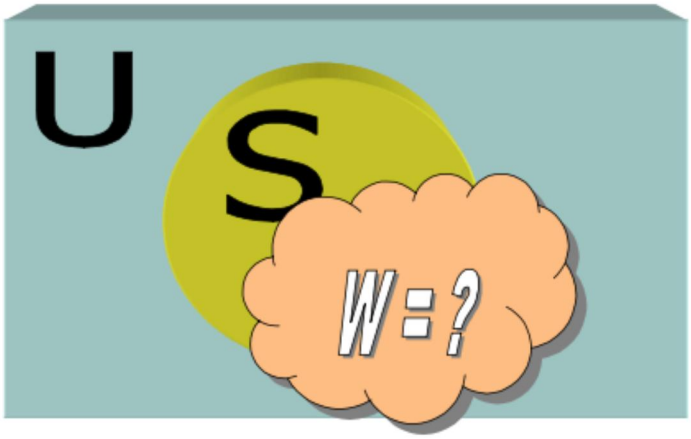

Fig. 2: The "critical difference" in systems thinking
The proper reference system for arguing claims is not a matter of course but rather, a matter of discourse! U = universe; S = current reference system of thought and action; W = the "whole relevant system"= the totality of circumstances and concerns that in principle would allow for conclusive argumentation of related claims to knowledge, rationality, or improvement, but which in practice we can hardly ever claim to fully and securely know.

We are facing an eternal dilemma of reason**:** the quest for considering everything possibly relevant is as unachievable in practice as it is indispensable in theory. Assuming that we can live up to it and indeed consider everything relevant leads to dogmatism (e.g., in the form of boundary judgments taken for granted); abandoning it, to uncontrolled deficits of rationality (e.g., in the form of neglected "external effects" and suboptimization). Responding to the dilemma by discarding the systems idea does not help either, for that would merely mean to accuse the messenger of causing the bad news it brings us. But the systems idea is neither the cause nor the solution of the problem, it is only the messenger. The only reasonable way out is to take the messenger seriously and choose the *critical path*, that is, undertake a systematic effort of dealing carefully and openly with the deficits of knowledge and rationality in question. While we cannot avoid such deficits, we can at least deal carefully with them and make an effort to lay them open to all those concerned. We can trace their sources in the assumptions of fact and value that guide us. We can analyze their actual or potential consequences, that is, the ways they may affect people. And we can then assess the claims in question in the light of these assumptions and consequences and can qualify (i.e., specify and limit) their meaning and validity accordingly. That is what critical systems thinking and its central methodological principle of boundary critique are all about.

The critical path or how to handle reference systems Given the importance of reference systems for our constructions of rationality, a critical path will have to dedicate special attention to their choice and handling. In particular, it will not allow the systems perspective, with its focus on a system or situation of interest (S), to become the only reference system for claims to knowledge and rationality. Accordingly, from a critical systems point of view, our handling of (S) should never assume that**:**

1. S = the only reference system that matters for adequate and rational practice;
2. S = W, that is, the system or situation of interest exhausts the totality of relevant conditions, circumstances, and concerns (a basic error of thought to which virtually all conventional systems thinking submits);
3. W = S + E, that is, the system of concern (S) and its environment (E) exhaust the "relevant whole system" (W) or even the total conceivable universe of discourse (U); and that
4. we ever have sufficient knowledge of W or even U to fully justify our claims regarding S and E.

Critical systems thinking (CST) is to avoid these common pitfalls of conventional systems thinking. They all are rooted in a mistaken identification of S with W, that is, in a tendency to elevate S to the only reference system considered for judging rationality. This is why CST is essentially about what above we have called the "critical difference" between S and W**:**

$$CST = f(\Delta\{W\text{-}S\})$$

To be sure, the notion of a whole relevant system (W) is a vague and problematic one. I use it rarely and for *critical purposes only,* that is, as a conceptual tool that reminds us of the inevitable imitations of any reference systems S on which we may choose to rely. The essential methodological consequence of this reminder is that we need to resist the temptation of making the system of primary interest or concern an unquestioned reference system for assessing claims. To put it perhaps a bit more succinctly, a basic imperative of critical systems thinking is this**:**

Never try to solve "the problem" of the system without also making "the system" the problem.

Thus understood, critical systems thinking always faces us with the question of whether the situation or context considered provides the proper reference system for identifying relevant "facts" and "values" and for accordingly

justifying claims to relevant knowledge, rational action, and genuine improvement. Consequently we should always ask**:**

What "critical difference" might a shift of perspective make, from the assumed system of concern (S) to different notions of the whole relevant system (W)?

It is with a view to making this question a focus of systematic methodological attention – in short, to "making the system the problem" – that in my work on critical systems heuristics (CSH), I have found it useful to rely on a standardized basic typology of reference systems (Ulrich, e.g., 1998 and 2017d). We may then understand such a typology as a basic conceptualization of the "critical difference" between S and W.

A typology of reference systems for boundary critique To guide systematic reflection on the conditioned nature and limited reach of our claims – to practice boundary critique, that is – CSH relies on these four ideal-typical rationality perspectives**:**

S – the *situation of concern* or system of primary interest;
E – the *relevant environment* or decision-environment;
A – the *context of application* or of responsible action; and
U – the total conceivable *universe of discourse* or of potentially relevant circumstances (see Ulrich, 2017d, pp. 17-28).

CSH takes these four types of reference systems to embody four fundamentally different rationality perspectives, each of which is essential for a systematic practice of boundary critique and is accordingly also informing some of the boundary questions that together make of the standard checklist of boundary questions used in CSH.[2)] (The French word *seau* – whence comes the acronym S-E-A-U – means as much as bucket, pot, or pail and is thus apt to remind us of the idea that all four perspectives belong to the toolbox of boundary critique.) In what follows, I would like first to briefly explain why the four reference systems are actually needed (i.e., what is the underlying logic) and then to take a closer look at the rationality perspectives they embody (i.e., how does this logic translate into rational practice). Two related core concepts will be what I call "the missing element" in the conventional logic of systems thinking and a resulting "three-level concept of rational practice" for critical systems thinking and practice.

"The Missing Element" The way I introduced the four types of reference systems in Part 1 of the previous essay (Ulrich, 2017b) was in terms of the kind of boundary judgments that shape our mental constructions of "the system" and which consequently allow us to trace the selectivity of related claims. A slightly different way is to look at the criteria for what "matters" in a situation and how what matters is related to S. Four such relations are logically possible (**Fig. 3**).

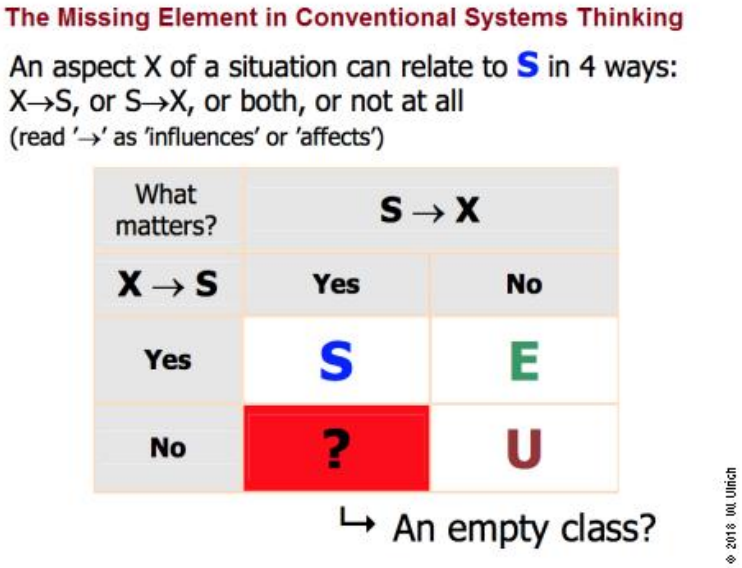

Fig. 3: The "missing element" in systems thinking

Conventional systems thinking is based on the systems / environment distinction. By assuming that the universe of discourse is exhausted by the reference systems S and E, such thinking leaves open the question of the nature and relevance of the "missing element" located in the red box, apart from tacitly narrowing the meaning of "relevance" to what matters to S.

U = universe; S = system of primary interest or concern; E = relevant environment (relevant, that is, to S); ? = "missing element" = gap in the argumentation logic of conventional systems thinking

Of these four relationships, three (S-E-U) can easily be understood in terms of the conventional reference systems of systems thinking, that is, the system of primary interest or concern (S), the relevant environment (E), and the remaining universe (U, also called the "irrelevant environment"). The boundary judgments that this conventional logic of systems thinking requires are (a) the delimitation of S from E (S/E) and (b) the delimitation of the environment considered relevant from that considered irrelevant (E/U). But what about the fourth relationship, the one marked by the red box in Fig. 3? In conventional systems thinking, this fourth basic relationship appears to be an empty class, as no corresponding reference system is identified and dealt with systematically, that is, as a constituent of any claim to systemic

rationality. There is a gap here in the argumentation logic of conventional systems thinking that I have hardly ever found to be recognized and systematically questioned.

The "context of application" This fourth relationship is what in CSH is called the "context of application" or also the "context of responsible action" or of accountability. It is a mandatory part of the suggested S-E-A-U formula of boundary critique (**Fig. 4**); but as far as conventional systems thinking is concerned, it has remained a "missing element" in its table of reference systems.

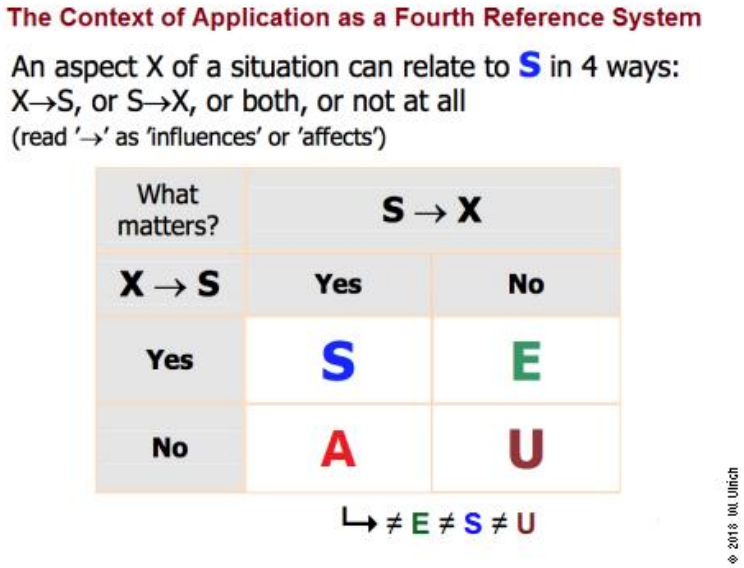

Fig. 4: The "context of application" in critical systems thinking
In conventional systems thinking, situational aspects or conditions that influence the system of primary interest but which cannot be controlled by it are considered "environment" in the sense that they constitute the system's relevant decision-environment (E). As they condition the outcome of systemic rationality or, in everyday terms, the system's success, there is an intrinsic interest to take the thus-understood environment into account. This is different from the context of application (A), which comprises all those situational aspects that are affected by (claims to) systemic rationality or, in everyday terms, by the system, but have no influence on it (i.e., the way rationality is defined and measured). A, then, is not part of the relevant environment E of S but rather, S is environment for A. Accordingly the implications of systemic rationality for interests and concerns treated as A are often neglected or considered as "external effects" about which one cannot do much, rather than as a systematic part of all claims to rationality.

The designation of A as "context of application" comes from science-theory, which conventionally distinguishes between three methodologically different tasks of research, concerning its proper handling of the contexts of discovery, of justification, and of application of scientific propositions. The aim is to narrow the relevant context for validating propositions so that the

circumstances of their emergence as well as the practical applications to which they lend themselves may be considered irrelevant for their justification. In distinction to this conventional view, the point of introducing A as a reference system for judging claims is of course that in the applied disciplines, and indeed in *all inquiry* that may eventually be put to practical use (that is, in virtually all forms of inquiry), considering the context of application is essential for justifying claims. In fact, it makes sense to conceive of the justification of *all practical claims* – to relevant knowledge, rational practice, and resulting improvement – in terms of the context of application, regardless of whether their context of discovery is science or everyday experience, for the selectivity of the claims in question remains the same. Well-understood science distinguishes itself from other forms of research and practice not by being free of selectivity but rather, by laying it open. We can then define the context of application quite generally as the real-world context in which a claim's consequences, when used as a basis for action, become manifest and should be systematically examined and justified.

There have been a number of efforts in recent decades to do more justice to the context of application (see, e.g., Beck, 1992, 1995; Gibbons et al., 1994; and Funtowicz and Ravetz, 1993, 1995); but neither the prevalent science-theory nor the dominating research practice appear to have taken much notice of them. Originating in the Vienna Circle's tradition of logical empiricism (e.g., Carnap, 1937; Ayer, 1936; Reichenbach, 1938) and in Popper's (1959, 1963, 1972) subsequent work on critical rationalism, the prevalent model of science today has remained focused on the "context of justification" as distinguished from the "context of discovery," a distinction first introduced by Reichenbach (1938, pp. 6f, 382) and later particularly emphasized by Popper. Even less importance is given in this model to the "context of application," the real-world situations in which scientific knowledge becomes "applied science" and in which accordingly it is supposed to secure successful and rationally defensible practice, that is, ultimately, some kind of improvement of the human condition. In any case, what I wrote about the issue some thirty years ago still remains a continuing challenge**:**

> Epistemologists such as Karl. R. Popper (1959, 1963, 1972) have claimed that the context in which science is applied is relatively irrelevant for the justification of its propositions. In distinction to this position, I propose to understand – and indeed define – applied science as the study of contexts of

> application. Of course this definition renders the distinction between the two contexts obsolete. From an applied-science point of view, the distinction is really quite inadequate**:** to justify the propositions of applied science can only mean to justify its effects upon the context of application under study. (Ulrich, 1987, p. 276)

In an age in which virtually all science sooner or later tends to become applied science and in which, conversely, ever more realms of practice are influenced by scientific research and professional expertise, the distinction between the context of justification and the context of application has indeed become obsolete. This is the more so if one considers how frequently research-based practice produces adverse external effects, cases of obvious suboptimization, and situations of "organized irresponsibility" (Beck, 1992, 1995). The implication can only be that the context of application is rapidly becoming an indispensable part of the context of justification. Yet in conventional systems thinking, as in many other fields and methodologies of inquiry, the context of application is still not systematically considered.

Environment vs. context of application There is a frequent confusion in that calls for considering the "environment" are mistaken to ensure a concern for the context of application. However, in systems thinking and in the many fields that have been influenced by it, the relevant "environment" is usually understood in a different way. The focus is on a system's *decision-environment*, that is, the situational aspects or conditions that influence the system of primary interest but cannot be controlled by it. As they co-produce the system's success or, in the terms of CSH, condition the outcome of systemic rationality, there is an intrinsic interest on the part of those involved to take the thus-understood environment into account. Accordingly it is also called the "relevant environment," meaning that part of the environment which has repercussions on the system. In this sense, then, systems management – the pursuit of systems rationality – includes environmental management, though not necessarily a stance of ecological concern. We are dealing with a managerial understanding of the environment that has little to do with what the concept of the application context intends; in fact it runs counter to it.

Those involved vs. those affected In distinction to the relevant environment (E), the context of application (A) comprises all those situational aspects that are affected by "the system" or related claims to systemic rationality but

which are not included in the reference system for assessing systems rationality or success. In consequence, the context of application tends to be taken into account – in short, to "count" – *systematically* only inasmuch as it happens to coincide with S or E, which is the case to the extent the affected parties have ways to influence the way "systems rationality" is defined or to coproduce a corresponding measure of "success." For the rest, S is relevant environment for A rather than the other way round. The methodologically essential focus will therefore be on those situational aspects – concerned parties or interests – that are *treated as A only.* The crucial boundary issue concerns the delimitation of those affected but *not* involved from those affected who are also involved (A/S). A graph offered in two previous publications may make this clearer than many words, I reproduce it here for the reader's convenience (**Fig. 5**). References to "those affected"or simply to "A," unless otherwise specified, will accordingly be understood to focus on the group of *those affected but not involved.*

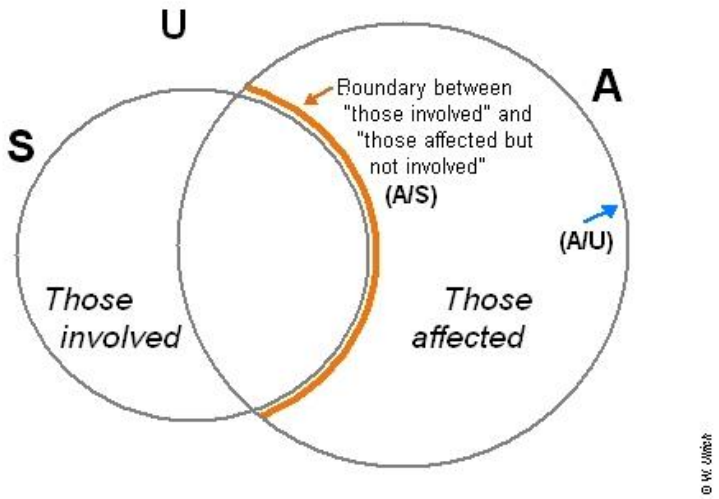

Fig. 5: Those involved vs. those affected but not involved, and how they relate to the two reference systems (S) and (A)
S = system (or situation) of primary interest, A = context of application, U = universe. While A as delimited from U (A/U) includes all those affected and thus provides the basic reference system for responsible action, the crucial boundary issue is often how those affected *but not involved* (A/S) are treated. (Source: adapted from Ulrich, 1983, p. 248, and reproduced from Ulrich, 2017d, p. 23, cf. pp. 19-27 for definition and discussion of reference systems E, A, and U.)

The context of application vs. the universe Remains the fourth reference system, the universe (U). Apart from being a logically needed residual category, it takes on a specific methodological meaning when it comes to dealing critically with the normative[3)] content of systems rationality**:** it refers us to the Kantian principle of *moral universalization*, better known as Kant's

(1786) "categorical imperative." The idea is to question the way we delimit the context of application – the external effects and concerns to be considered – as distinguished from the universe of all other, actual or conceivable, known or unknown external effects, many of which may be beyond closer consideration. Kant's idea was that a subjective norm (or maxim, as he says) of action cannot count as morally arguable and in this sense rational unless all those affected could in principle agree. The difficulty is, how do we know whether they could? Kant invented the *categorical imperative* as a practical universalization test**:** it asks us to put ourselves in the place of all those effectively or conceivably concerned and check whether we could then still find the maxim in question to be arguable, and thus generalizable (i.e., a general norm of action rather than just a subjective maxim). In our epoch, Apel (1972) and Habermas (1990) have uncovered the communicative kernel of the categorical imperative and hence have translated it into a model of *rational practical discourse,* an idea that is beyond adequate discussion in this Postscript but which I have discussed extensively on a number of other occasions (see Ulrich, 2009a-c; 2010a, b; 2011b; 2013; 2015). Suffice it here to note that (U) is a relevant reference system inasmuch as in morally arguable practice, the delimitation of A against U is to be considered no less carefully than all other boundary issues (S/E, E/U, and A/S).

The "three-level concept of rational practice" In his ground-breaking work on "ideal-types" of rational action,[4)] the German sociologist Max Weber (e.g., 1968, pp. 6-9, 20f) distinguished between social and nonsocial action on the one hand and between rational and nonrational action on the other. Action is "social" when it is oriented towards mutual understanding in the double sense of sharing individual ideas about what is good and rational action with others and trying to find agreement on them; it is "nonsocial" when it is oriented towards securing one's owns interest or success by means of purposive-rational action. Further, action is "rational" rather than "nonrational" to the extent it is guided consciously and coherently by either of these two orientations, with the added benefit that an objective interpretive can better recognize it as such. From these distinctions Weber derived four (in practice**:** more or less) coherent types of action, the *intrinsic logic* of which an observer can rationally understand (in the order of decreasing

weight of rational as compared to empathetic understanding**):**

- *purpose-rational action* uses efficacious means for reaching ends;
- *value-rational action* is consistent with underlying values;
- *affectual action* responds to empathetic or emotional reasons; and
- *traditional action* follows individual habit and social custom (cf. Weber, 1968, esp. p. 24f).

Weber's account is complex and need not concern us here in any more detail, the more as interested readers will find my understanding of it explained elsewhere (Ulrich, 2012b, pp. 4-18). For our present purpose it will be quite sufficient to rely on a helpful revision of Weber's typology by Jurgen Habermas (1984, pp. 284-288), a revision that was motivated by the attempt to incorporate the "communicative" side of rational action, along with a shift of perspective from that of an understanding observer (aim**:** "interpretive social science") to that of a responsible agent (aim**:** "theory of communicative action").

Like Weber, Habermas starts by distinguishing situations of social from nonsocial action. But he then adds a distinction that matters for identifying the quality of social action, between "consensus-oriented" (or communicative) and "success-oriented" (or noncommunicative) orientation, rather than just distinguishing with Weber between rational and not so rational orientation (the latter distinction is implicit in the proper use of ideal-types). It helps to understand the intent of the additional distinction by recalling Habermas' (1971) earlier, largely parallel distinction between "work" and "interaction" as two fundamental dimensions of practice that go back to Aristotle's concepts of *poiesis* (work, production) and *praxis* (action, interaction). Cross-tabulating the two distinctions yields three basic types of rational action, one standing for a "nonsocial" type of rationality and the others for two variants of the "social" type **(Table 1)**.

Table 1: Social and nonsocial types of rational action
(Source: adapted from Habermas 1984, p. 285, cf. Ulrich, 2012b, p. 26)

	Action orientation	
Action situation	Noncommunicative: **"Success"** (own interest)	Communicative: **"Consensus"** (mutual understanding)
Nonsocial	Instrumental action	— — —

"Instrumental" action represents a type of *nonsocial action* that is oriented toward what Weber called purpose-rationality, a rationality that is defined by the choice of efficacious means for achieving given ends. As Habermas puts it, it pursues a type of rationality that in its pure form is not oriented towards securing mutual understanding as a value of its own but only towards securing "success" in the limited sense of reaching the end as fully and efficiently as possible. By definition, then, there is no "communicative" variant of nonsocial action and for this reason, the corresponding box in the table remains an empty class. Such a type of rationality, if it existed, would violate Weber's requirement of a recognizable internal "logic" or coherence; in the terms of Habermas, an agent cannot adopt a nonsocial orientation (i.e., prioritize a private utilitarian rather than a communicative and cooperative agenda) yet claim to be oriented towards mutual understanding or "consensus" rather than "success."

"Strategic" and "communicative" action, by contrast, both represent types of *social action.* Since such action may be oriented towards either success or consensus, there are two ideal-types of socially rational action. When oriented primarily to success, social action is interested in the concerns of others only in the opportunistic sense of securing its own success by taking into account their intentions and actions; it represents a "strategic" type of rationality rather than a "communicative" orientation in the full sense of securing *mutual* understanding and cooperation. This latter orientation is what "communicative rationality" as Habermas understands it is about; the ideal-typical focus is on reaching "consensus" rather than "success" or, to put it differently, its notion of success is oriented towards a type of rational action that is coordinated discursively, by "communicative practice" rather than merely strategic behavior (cf. Habermas, 1984, p. 101).

The merit of Habermas' reading of Weber's typology of rational action is that it lends itself to much further reaching critical use. This is so because it overcomes several of the difficulties in Weber's attempt to clarify the meaning of rational action within his framework of interpretive social science, I mean particularly its identification of purpose-rationality with the most rational type of action and its lacking grasp of the social (meaning both

intersubjective and societal) dimension of well-understood "rational" practice. As I would argue, Weber's inadequate grasp of what rational *social* practice means is rooted precisely in his focus on interpretive social science**:** it caused him to mistake the internal "logic" or coherence of individual action for a major criterion of socially rational action. Such a perspective is meaningful for an interpretive observer, but not for a responsible agent. Weber ended up elevating purpose-rationality to the highest level of his typology of rational action simply because it is the type of rational action that is most easily recognized – or as Weber might put it, the internal logic of which is most easily interpreted – by an objective observer. The result is a fundamental confusion between the rationality of the social scientist's understanding on the one hand and that of the social practice to be understood on the other hand. As the former moves into focus, the latter becomes blurred and ultimately vanishes from sight (see Ulrich, 2012b, p. 19f).

Integrating the communicative dimension of rational action, among other important merits such as its opening up the perspective of a discursive concept of rationality, has the advantage of overcoming Weber's fixation on purpose-rationality and thereby opening up new horizons for rational critique and improvement of social practice. As Habermas puts it**:**

> The theory of communicative action can make good the weaknesses we found in Weber's action theory, inasmuch as it does not remain fixated on purposive rationality as the only aspect under which action can be criticized and improved. (Habermas, 1984, p. 332)

Three types of rationality critique Let us see, then, how this basic typology of rational action might be put to critical use within a framework of critical systems thinking and practice. To this end we need to clarify the relations between the three ideal-types of rationality – instrumental, strategic, and communicative – a bit more. How precisely should we understand and handle their basically complementary, yet in practice often conflicting, nature? Is there a way to use them so that *together* they can ensure rational practice? And hence, do they lend themselves to constructing a practicable, *integrated* model of rational practice?

I propose that a satisfactory answer depends on a transition from Kant's (1786, 1787) two-dimensional concept of reason (theoretical vs. practical reason), which we still recognize in the framework of Habermas (success vs.

consensus, work vs. interaction, noncommunicative vs. communicative rationality), to an integrated, hierarchical concept. A multi-level conception of rational practice converts the merely "horizontal" addition of practical reason to theoretical-instrumental reason into a *vertically integrated* conception, so that practical reason is construed as a higher (or perhaps better, richer) level of rationality that incorporates all lower levels. I have long since used such a framework in my work on critical systems thinking (see esp. Ulrich, 1988, pp. 146-160; 2001b, pp. 79-82; and 2012b, pp. 31-34); but its focus was on integrating the normative dimension of systems rationality into contemporary, science-based and often also one-sidedly technical and/or managerial notions of rationality, rather than on operationalizing boundary critique. In short, the aim was to explain the nature of rational practice, while now it is to explain the reference systems for boundary critique. Here, then, is the latest version of my *three-level concept of rational practice* (**Table 2**).

Table 2: Three-level concept of rational practice
and related reference systems for boundary critique
(Source: adapted from Ulrich, 1988, p. 148, cf. p. 156f; 2001b, p. 81; and 2012b, p. 32)

Concept of rationality: levels of rationality critique	**Action type:** types of rational orientation	**Core issue:** types of problem pressure	**Reference system:** types of boundary critique	**Example of corporate management:** typical objects of rationalization
Communicative rationality: practical-normative	Social: oriented to understanding	Conflict: ethical integration of conflicting interests	A: What is the relevant context of application or of responsible action?	Normative management: corporate values/ social responsibility; stakeholder discourse
Strategic rationality: theoretical-instrumental	Social: oriented to success	Complexity: effective steering of complex systems	E: What is the relevant decision-environment?	Strategic management: corporate competitive advantage; strategic change
Instrumental rationality: theoretical-instrumental	Nonsocial: oriented to success	Cost: efficient use of scarce resources	S: What is the system of primary interest or the situation of concern?	Operational management: corporate operations; organizational structures and procedures

This new version of the model now explicitly ties the quest for rational practice to systematic boundary critique, which thus becomes an integral requirement of all applied rationality critique. To each of its three levels of systems rationality, the model assigns a conforming type of reference

systems, as defined in the S-E-A-U formula of boundary critique. Conversely, the scheme can be understood to work out the different rationality perspectives for which the reference systems stand. The explanation thus works in both ways**:** rationality perspectives can be explained in terms of boundary critique, and boundary critique in terms of rationality perspectives.

A further, essential element of a proper understanding and employment of the model consists in what I propose to call the principle of *critically vertical integration* of systems levels. Since introducing it requires a bit more space, I will do so in a separate, concluding subsection below. First, I suggest we very briefly consider some of the main theoretical merits of a multi-level conception of rational practice and then illustrate its practical implications – the difference it can make for our understanding of rational practice – by means of two examples.

Regarding the more theoretical merits, there are some rather obvious advantages of the shift from a horizontal to a vertical understanding of systems rationalization. Conventional horizontal conceptions of systems rationality locate gains of rationality primarily in an expansion of systems boundaries; they have therefore tended to overlook the need for not only *enlarging* but also questioning and *changing* the reference systems presupposed in claims to rationality. At the same time, they have found it difficult (and have usually failed) to integrate the normative/communicative dimension of rationality, that is, to give it a *systematic* place in the quest for rational practice and in conforming efforts of rationality critique. A multi-level framework can help to reduce these difficulties along the following lines (I'll content myself with simply listing them, without discussing them any further)**:**

(1) Most basically, the framework puts the three ideal-types of rational action (as summed up in Table 1 and emerging from the sociological tradition of Weber and Habermas) into a *compelling yet simple order* and thereby clarifies their meaning and mutual relationship.

(2) It connects the three Weberian / Habermasian ideal-types of rational action with the two traditions of *practical philosophy* and of *systems theory*, and thereby corrects a fundamental deficit of Weber's typology of rational action, it's not being grounded in practical philosophy, along with the missing recognition of the role of boundary critique in

Habermas' work.

(3) It gives new meaning and practical significance to Kant's two-dimensional conception of reason and thereby to his demand for the *primacy of practical reason*, thus helping us to breathe new life into practical philosophy and to pragmatize these two basic ideas of it.

(4) It enriches the "horizontal" thrust of conventional systems thinking, towards expanding systems boundaries, by a methodologically more fruitful "vertical" perspective of conceptual *levels of progressive rationalization of systems* (compare on this Feibleman's notion of "integrative levels" as discussed in the concluding section on "vertical integration").

(5) It integrates the *communicative turn* of our understanding of rationality, as introduced by Karl-Otto Apel (e.g., 1972) and Jurgen Habermas (e.g., 1984), into the practice of rationality critique and thereby paves the way for a critically-normative and discursive concept of rationality, another missing element in the prevalent, scientifically oriented conception of reason.

(6) Last but not least, it systematically relates the three ideal-types of rationality to the *reference systems for boundary critique* proposed by the S-E-A-U scheme of CSH and thereby is apt to deepen our understanding of both, the idea of a three-level concept of rational practice and the meaning of the related reference systems for boundary critique.[5)]

It is obviously the last of these six points that interests us here particularly. Understanding Weber's and Habermas' ideal-types of rational action in the terms of corresponding reference systems for boundary critique is to my knowledge a new idea. More importantly, I see in it the key for developing a conception of critically-normative practice that unlike Habermas' (1979, 1990, 1993) ideal conception of discursive rationality, which ties rational consensus to ideal conditions of practical discourse, is both theoretically convincing and practically achievable. This is so because boundary critique allows critical argumentation on all aspects and implications of claims to rationality, including its normative implications, without depending on conditions of perfect rationality. Quite the contrary, as it does not depend on any particular knowledge or skills that ordinary citizens would not be able to have, boundary critique is apt to promote a new kind of *symmetry of critical competence* among experts, decision-makers, and citizens so that they can all meet as equals (see Ulrich, 1993 and 2000).

At the same time, I should emphasize that the six listed points are interdependent. *Together,* they open up a systematic perspective for bringing back in to our contemporary conception of rationality the practical-normative dimension that has largely been lost with the rise of science and the expansion of theoretical-instrumental rationality it brought. At good last, we may hope to find some systematic ways for "disciplining" the dominance of instrumental rationality, and thus to recover some of the lost balance between theoretical and practical reason**:**

> Both philosophically and pragmatically speaking, … the quest for rational action needs to break through the usual dominance of theoretical-instrumental rationality. To this end, we need to "discipline" the use of theoretical-instrumental rationality by subjecting it to the primacy of practical reason, thus advancing from a state of mere co-existence of theoretical and practical reason ("mere" in that it remains methodologically undefined and gives us no orientation as to how to handle their clash) to an understanding of rational practice that gives practical reason a chance. (Ulrich, 2012b, p. 32)

Such an understanding of rational practice should make it definitely clear that the three underlying ideal-types of rational action do not embody meaningful alternatives, not any more than Kant's two dimensions of reason do. Rather, they are part and parcel of an integrated concept of levels of systems rationalization, whereby each level is characterized by a specific type of reference system for rationality critique (which in turn is supported boundary critique). Although in actual practice the three levels may of course be developed to varying degrees, it is clear that good practice depends on giving due consideration to all three levels, as each depends for its full rationalization on the other two. Any gains of rationality at the two higher levels must build on the two lower levels, and at the same time, the upper levels must provide orientation to the good use of the lower levels. The scheme thus suggests that the handling of each level is deficient so long as it is not informed and supported by the other two. Consequently, the three rationality perspectives each also lend themselves to *critical* use with respect to the other two, in addition to their relevance for examining claims at their own level of systems rationalization. Accordingly, the three-level concept of rational practice can also usefully be understood as a framework for applied rationality critique.

To illustrate the practical relevance of the three levels of critique and the ways they are tied to the reference systems S, E and A, I have added in the right-hand column of Table 2 an example of their interpretation in the field

of corporate management.[6)] In management terms we can understand the three rationality perspectives of S, E, and A to focus on these three management levels (beginning with the lowest level)**:**

– *operational systems management,* in which the focus is on the management of cost and resources (i.e., building up potentials of operational success, with the main system of concern being S);

– *strategic systems management,* in which the focus is on the management of complexity (i.e., developing steering capacities in view of uncertainy and change, with the main system of concern being E); and

– *normative systems management,* in which the focus is on the management of conflict (i.e., building up potentials of mutual understanding with all the parties concerned).

In short, the three rationality perspectives can be characterized to focus on managerial core issues related to the management of cost, of complexity, and of conflict. To be sure, this is not an entirely new idea. Such multi-level frameworks have been proposed before, for example by Jantsch (1970, 1975), Beer (1972 / 1981), Espejo et al. (1996), and Schwaninger (2001, 2009). However, while these schemes offer a useful extension of the management and planning approaches of the fields in which they were developed, among them technological forecasting and planning, organizational cybernetics, and management theory, they differ from the scheme suggested here in one important respect**:** they are not grounded in practical philosophy. In the terms of Habermas' typology (Table 1), they remain more or less limited to an orientation towards success (with the "less" applying to Jantsch's framewok, to which we will return below). Accordingly their highest level of systems rationalization remains that of strategic management. They have no means for dealing with the communicative requirements of conflict management that arise when it comes to resolving normative issues, including ethical and moral issues, by means of openly and critically normative argumentation and discourse. In contrast, the three-level concept of rational practice suggested here is grounded in practical philosophy and for this reason can overcome the other schemes' tacit limitation to a merely managerial and strategic notion of rationality that remains tied to an orientation to success. The aim of the present framework reaches further, at what on an earlier occasion I described as *vindication beyond mere reference to self-interest,* that is, as an understanding of

rationality that includes reference to the views and values of parties other than those directly interested and involved – the very core idea of "communicative rationality" (see Ulrich, 2011a, p. 9f). These few remarks must suffice here; for a detailed discussion of the three management levels as understood in the management literature and in my work on critical systems thinking, I may refer the reader to the earlier-mentioned essays (Ulrich, 1988, 2001b, and 2012b).

Two application examples To help readers in appreciating the relevance of the proposed three-level framework of rational practice, let us now turn to two major examples of application. I adapt them here from earlier discussions (see Ulrich, esp. 1988 and 2012b).

First example: "Stakeholder management" In the seminal text on "stakeholder theory," Freeman (1984, p. 46) defined stakeholders as "any group or individual who can affect or is affected by the achievement of an organization's objectives." A similar, slightly shorter definition defines them as "groups or individuals who can affect, or are affected by, the organization's mission" (p. 52). The definition is widely cited and accepted to this day, yet it is so underspecified that it is hardly useful, in fact, it glosses over the problems it raises. There is no mentioning of the boundary judgments involved, and accordingly no specification of criteria and processes for the boundary critique that would seem required for critical practice (cf. Achterkamp and Vos, 2007). Even worse, the definition glosses over the crucial distinction between stakeholders who are in a position to influence the organization's success or mission and thus the ways it affects them, and others who cannot. In the terms of our earlier Fig. 5, doing justice to stakeholders requires a clear distinction between those *involved* and those *affected but not involved.*

From a perspective informed by our three-level model of rational practice, it is indeed crucial to carefully distinguish the two groups, as they belong to different reference systems. The first group, inasmuch as it is not identical with those involved in the organization (reference system**:** S) belongs to the organization's decision-environment (reference system**:** E), which is that section of the universe which affects the system but is not part of it. The second group, in contrast, comprises all those stakeholders that are or risk

being affected *without* having any influence upon the organization; they are, in the terms of CSH, the group of "those affected but not involved" (reference system**:** A).

As soon as one understands the two stakeholder groups in such terms of boundary critique and related reference systems, it becomes clear that glossing over their different nature in the way Freeman's definition does it is bound to lead into an inadequate treatment of the second group. Its treatment risks being perceived to be of secondary importance as no repercussions are expected for S; it is to S part of the "irrelevant" environment (U) rather than of the "relevant" environment (E). Not surprisingly, then, stakeholder management has achieved little in strengthening corporate social responsibility for all stakeholders, not just for those who are in a position to affect the corporation's success and whose correct treatment is therefore in the very interest of corporate management. This is indeed what has happened, and continues to happen regularly, in the practice of this so-called "stakeholder theory."

In the terms of the three-level concept of rational practice, stakeholder theory has remained limited to the strategic level of systems rationalization. It has no conception of the normative level and its need for boundary critique oriented towards careful identification and handling of the context of application (or of responsible action). This limitation comes as no surprise, given that stakeholder theory was developed within the horizon of the strategic management literature. As a representative text book of strategic management (Thompson (1997) puts it bluntly, a key concern in taking account of the needs of different parties concerned by the corporation's aims and activities is indeed a party's power to affect the corporation's success**:**

> Stakeholder theory postulates that the objectives of an organization will take account of the various needs of these different interested parties who will represent some type of informal coalition. Their relative power will be a key variable, and the organization will on occasions "trade-off" one against the other, establishing a hierarchy of relative importance. (Thompson, 1997, p. 148)

Mind you, the stakeholders will be ranked regarding their importance according to their "relative power" to *affect* the organization or its success, not the other way round, according to the severity of the ways in which they may be affected. In the terms of Figures 3 and 4 above, what is taken to "matter" for the organization's response to stakeholder concerns – the way it

will treat these concerns – is the relation X–>S rather than S–>X; which is to say, the reference system identifying relevant concerns and rational responses is taken to be E, not A. In everyday terms**:** thus-understood stakeholder management is motivated by the organization's own interests rather than by the genuine interests and concerns of third parties, particularly if they have little power. One must wonder, then, what should be new in stakeholder theory as compared to previous management theories in its handling of third parties. After all, the reference systems for assessing managerial or organizational "success" and related rationality claims remain the same (S/E).

The level of communicative rationality and its normative core thus remain outside the conceptual grasp of stakeholder theory. With its deficient definition of stakeholders, it misses its aim from the start. The underlying concept of rational practice remains tied to the idea of building operational and strategic potentials of success, rather than opening up the universe of discourse to ethical and moral issues of dealing with genuine conflicts of interests and needs, of views and values, whereby all the parties concerned would be treated with equal regard for their concerns, regardless of the influence they have upon the organization. The conclusion is inevitable**:** due to its being grounded in strategic management but *not* also in practical philosophy, stakeholder theory fails to do justice to the level of normative management and its requirements of critically-normative discourse. This theoretical deficit need not of course preclude that individual managers of good will may still want to do justice to the concerns of all affected parties; but such a personal stance will not be a *systematic* part of the systems rationality at work. It does not "count" in the system's measure of success and worse, to the extent that caring about the interests of third parties may involve some cost, such managers of good will even risk being accused of not living up to their full responsibility for the organization's success.

Stakeholder management has thus become for managers a lip service paid routinely – a managerial ritual, so to speak – rather than a new stance of responsibility, much less a new concept of corporate rationality. As Freeman himself avows in explaining his above-cited, crucial definition of stakeholders, the outlook remains basically utilitarian or oriented to "success" rather than to mutual understanding and cooperation with all the parties concerned**:**

> From the standpoint of strategic management, or the achievement of organizational purpose, we need an inclusive definition. We must not leave out any group or individual who can affect or is affected by organizational purpose, *because that group may prevent our accomplishments*. Theoretically, therefore, "stakeholder" must be able to capture a broad range of groups and individuals, even though when we put the concept to practical tests *we must be willing to ignore certain groups who will have little or no impact on the corporatio*n at this point of time. (Freeman, 1984, p. 52f, italics added; compare also Freeman's additional reference to the "stakeholders whose support is necessary for survival" on p. 33.)

From the outset, stakeholder management thus fails to recognize – or take seriously – the conflict of rationalities involved. It knows only one type of rationality, that which serves its own interests. Consequently it also fails to systematically develop the idea that stakeholding might serve a self-critical purpose and might to this end be driven by different rationalities and corresponding action orientations and reference systems. In the terms of our three-level concept of rational practice (cf. Table 2 above), it would indeed make a fundamental difference if corporate managers would approach stakeholders not only with a strategic but also, and primarily, with a communicative concept of rationality in mind. So long as stakeholding relies on an unquestioned strategic concept of rationality, it will deal inadequately with the normative level of management and thereby forsakes much of its potential for improving management practice. Which after all is what stakeholder theory, by advancing a supposed alternative to the classical, economic and managerialist theory of the firm, was meant to achieve in the first place.

Second example: the "open systems" fallacy A second example is offered by the so-called *open systems approach* in systems thinking. There is a widespread belief in the systems literature that an "open systems" perspective is more conducive to societally rational decision making than are conventional closed systems models. But once again, like in the previous example, we are facing a claim that in practice turns out to be misleading, due to its not being grounded in a clear conception of the rationality concepts at issue. I analyzed this "open systems fallacy," as I call it, on three earlier occasions[7)] and found it a useful way to explain one of the core ideas of my work on "critical systems heuristics" (CSH)**:**

> "Open," in contrast to "closed," systems models consider the social environment of the system; but so long as the system's effectiveness remains the only point of reference, the consideration of environmental factors does nothing to increase the social rationality of a systems design. In fact, if the normative orientation of

> the system in question is socially irrational, open systems planning will merely add to the socially irrational effects of closed systems planning. For instance, when applied to the planning of private enterprise, the open systems perspective only increases the private (capital-oriented) rationality of the enterprise by expanding its control over the environmental, societal determinants of its economic success, without regard for the social costs that such control may impose upon third parties.
>
> Generally speaking, a one-dimensional expansion of the reach of functional systems rationality that is not embedded in a simultaneous expansion of communicative rationality threatens to pervert the *critically heuristic purpose of systems thinking* – to avoid the trap of suboptimization and to consider critically the whole-systems implications of any system design – *into a mere heuristics of systems purposes*. This means that it is no longer "the system" and the boundary judgments constitutive of it that are considered as the problem; instead, the problems of the system are now investigated. (Ulrich, 1988, p. 156, orig. italics; with reference to Ulrich, 1983, p. 299)

Not unlike what has happened in strategic management theory and management education, as illustrated above by the example of so-called stakeholder theory, systems thinking has become seriously impoverished as it has lost sight of *the other, non-utilitarian dimension of rationality,* a rationality perspective that we have characterized above in terms of social rather than nonsocial orientation (M. Weber), communicative rather than success-oriented rationality (Habermas), or in Kantian terms also as theoretical-instrumental vs. practical-normative reasoning. The two fields of management thought and systems thinking also have in common that they both have been influential, in the past few decades, in shaping our contemporary notions of good and rational practice – so much so that an effective handling of the many pressing problems of our epoch is now almost synonymous with calls for more systemic thinking and for stakeholder management. However, the promise of these two approaches is unlikely to be fulfilled so long as the underlying rationality concepts are impoverished.

Accordingly imperative it is that the two-dimensional nature of rationality receive more attention and become an integral part of the "open systems" approach, no less than of stakeholder management. This should happen in a manner that would clarify the mutual relationship of the two dimensions and strike a better balance between them, that is, *strengthen the communicative dimension* and with it the critically-normative issues that it entails. As long as we merely see in the latter dimension an added consideration that is "nice to have" but, regrettably, often clashes with the need for successful action under pressures of time and money, little will change. Since the two dimensions often clash, it is indeed difficult to think and argue clearly and consistently about what constitutes good and rational practice. Again a

Kantian handling of the two dimensions gives us the crucial hint**:** we can avoid unresolved rationality conflicts between them by bringing them into a vertical order, so that their relationship and ranking become clear and do justice to their nature or to what Kant (1786) calls the *primacy of practical reason.* In everyday terms we might speak of the *means* character of theoretical-instrumental reason as related to the selection of *ends* that must inform it and which in turn is to be guided by practical-normative (including moral) reasoning and corresponding, critically-normative discourse.

A multi-level conception of rational practice as proposed in Table 2 offers a relevant, practical framework for such two-dimensional systems thinking, lest it remain a mere ideal. It frees "open" systems thinking from being tacitly and unquestioningly tied to a merely instrumental, success-oriented concept of rationality; a concept of rationality that extends the reference system from S to E but has no grasp of A, and which for this reason also achieves little in the way of bringing into play the level of communicative rationality. The crucial point, as we have well understood by now, is that a mere expansion of systems boundaries from S to E does not at all achieve a change of the rationality perspective at work; for the assumed reference systems for measuring successful and rational action remains the same (S/E). Only the conceptual move to a different reference system, the context of application (A), implies a substantial shift of the rationality perspective at work; which is what the suggested framework achieves with the move to the third level of communicative rationality.

Generally speaking, then, reflective practice calls not only for an extension of our horizon of considerations but also for a conscious change of the standpoint from which we seek to extend it. A mere expansion of systems boundaries does not achieve this, as the underlying rationality remains basically the same. Within a framework of conventional systems thinking, chances are that an expanded "systems rationality" (*sic*) will remain focused on the success of the system of interest. It will thus tend to remain subject to a strategic (i.e., utilitarian) rather than communicative (critically-normative) handling of the social aspects of the situation. The *open systems fallacy* occurs when our systems thinking aims at an expansion of rationality without being embedded in a reflective *and* communicative effort of challenging the notions of rationality in play (cf. Ulrich, 1988, p. 156f).

Open systems thinking that understands the issue becomes *critical systems thinking*. Its methodological focus will be on systematically questioning the different *reference systems* – the sets of boundary judgments, that is – that inform the "facts" and "values" (or the considerations and concerns) taken to be relevant for judging situations and assessing good and rational action. This is of course what CSH's core principle and major tool of *boundary critique* is all about. By explicitly integrating the concept of boundary critique into the three-level concept of rational practice (an aspect that was still only implicit in the framework's earlier versions of 1988, 2001, and 2012), I hope that both concepts as well as their interdependence have gained in clarity and critically-heuristic power, so that they can support one another in the never ending quest for good and reflective practice.

I would like to conclude this discussion on the meaning and use of reference systems in boundary critique with a hint at one more methodological principle that is apt to guide critically-normative practice along the lines suggested in this essay, I call it the principle of *critical vertical integration* of rationalization levels. I adopt it, once again, from an earlier account (Ulrich, 2012b, pp. 37-39).

Final consideration: the principle of critical vertical integration The term "vertical integration" was to my knowledge first used by Erich Jantsch (1969a, p. 54f; 1969b, p. 190f) in the context of technological forecasting and planning. He used it to refer to the integration of all its tasks – "activities" or "functions," as he called them, such as exploring and assessing existent technologies; anticipating and designing technological futures; and defining objectives and policies for the "joint systems of society and technology" (p. 8) – within a systems-theoretically and scientifically based framework of *policy sciences*, a field emerging in the 1950s and 60s (the seminal publication is Lerner and Lasswell, 1951). Jantsch calls such an integration of forecasting and planning functions "vertical," in distinction to the need for considering, in each stage of technology development, the larger context of the different subsystems involved (man-technology, nature-technology, and society-technology), to which he referred as "horizontal" integration.

In a slightly broader perspective, exploring the integration of *human design*

with an evolutionary perspective, Jantsch (1975, pp. 123, 209, 224) also speaks of "vertical centering," in a sense that comes closer to what I mean with the vertical integration of rationality levels. I can best explain my intention by means of a graph that I equally owe to Jantsch (esp. 1975, p. 209). Adapting it to our present aim of grounding the notion of rational practice in practical philosophy rather than in management and planning theory (along with systems thinking), and consequently integrating the level of communicative rationality, we get the following scheme (**Fig. 6**).

Fig. 6: The principle of vertical integration of rationalization levels
"Critical vertical integration" is a major principle that helps to understand and apply the three-level concept of rational practice proposed above properly. (Source: adapted from Jantsch, 1975, p. 209, and Ulrich, 1975, p. 75)

The graphic part of the scheme (but not the revised text) betrays its origin in cybernetic thinking and more specifically, in Ozbekhan's (1969, p. 132f) notion of "controlling feedback" loops, according to which "each distinct level of action is controlled by feedback emanating from a different level of the hierarchy" – the idea that provided the inspiration for Jantsch's original graph. In my own understanding of such *integrative multi-level thinking*, Ozbekhan's and Jantsch's planning levels become levels of rational practice in general. As the previous discussion should also have made clear, I do not follow Ozbekhan and Jantsch in their cybernetic rather than moral and political understanding of "control." The point is not to adapt plans or actions to supposedly objective or natural requirements of the planning "environment" (reference system**:** E) but rather, to subject them to the views

and values of those who may have to live with the consequences (reference system**:** A) – the communicative dimension of rationality. Accordingly, the different levels of thought are to guide *rationality critique* (including boundary critique) rather than just managerial control of "turbulent" environments so as to achieve "organizational stability," as a famous concept of the epoch had it (Emery and Trist, 1969, pp. 248-253).

The fact that the idea of communicative rationality was not available to Ozbekhan and Jantsch at the time may explain why their frameworks for technological planning and policy "sciences" remain strangely apolitical and do not (or at least, not systematically) take up the ethical and moral questions involved, despite frequent references to values and "normative" forms of planning. Again, the difference is that Ozbekhan and Jantsch did not ground their notion of rational policy-making in practical philosophy but on the contrary, aimed to extend the reach of science into practical-normative territory (compare my discussion, in Ulrich, 2012a, pp. 6-9, of these two opposite approaches to improving practice).

Where I agree with Jantsch and Ozbekhan is that integrative multi-level thinking, and thus (in our case) well-understood instrumental, strategic, *and* communicative rationalization of practice, should always move (or perhaps better, communicate) *between* and *across* the different levels at which ends and means, and with them also values and consequences, can be defined and questioned. Only thus can each level of rationalization *infuse meaning* (cf. Ozebekhan, 1969, p. 133) into the other levels, whether (as I'd like to add) in the form of direction (e.g., guidance, support) or challenge (e.g., questioning of reference systems, unfolding of selectivity and partiality). Consequently, each of our three levels of rational practice also call for examination (and implicitly, again, for communication) from both a top-down and a bottom-up perspective. To handle the three levels reflectively, we therefore need to conceptualize means and ends at no less than *five levels*, as suggested by the middle column in Fig. 6 above**:**

- *Norms of action:* highest standards or principles of action (e.g., moral and democratic principles); they shape our *values* and ideals.
- *Normative ends:* standards of improvement defined by personal and institutional values and by related notions of intended consequences; they shape our *policies.*
- *Strategic ends:* objectives defined by policies; they shape our

strategies and tactics of action.

- *Operational ends:* goals defined by strategies and tactics; they shape specific *operation*s or procedures of action. And finally,
- *Means:* basic resources defined by available sources of support; they shape the *feasibility* and *efficiency* of action.

We may then understand our three levels of rational practice to function as communication channels or platforms, as *intersections* at which different needs and notions of rationalizations meet and can convey meaning and challenges to one another. Such *communication across systems levels* or, implicitly, across the boundaries of different reference systems, is indispensable with a view to recognition and integration of competing or clashing rationality requirements. We may consequently also capture the idea of a mandatory process of moving up and down the hierarchy by referring to the three rationalization levels as *integrative levels*, a concept that to my knowledge Feiblemann (1954) was first to explain systematically, although still in a context of mainly functional thinking (e.g., in biology and ecology). In the present context I understand integrative levels as conceptual levels of rationality that gain their full meaning and validity only in the light of a combined, or "integrative," multi-level perspective. The practical way to implement this idea is by an *iterative process of vertical centering:* each level is at regular intervals (iteratively rather than permanently) to be in the center of systematic review both from above and from below.

This way of visualizing and describing the idea of vertical integration should also remind us that each of the three concepts of rationality has to play a *critical role* with respect to the other two. Each level is to help us "discipline" the claims to rationality of the others, as it were. Vertical integration is first of all *rationality critique.* It is a principle of reflective practice. It understands rational action as the result of a self-reflecting and communicative process of rigorous scrutiny of its assumptions and implications across the three levels of rationalization. Speaking of vertical integration is thus really just a convenient short formula for what is more precisely called the *principle of critical vertical integration.*

To be sure, vertical integration is not meant to replace horizontal integration but rather to give it a new depth, so to speak. Rationality critique has both a horizontal and a vertical dimension; both matter in boundary critique. A

well-understood "open systems" perspective will henceforth question our reference systems, and unfold their implications, in both horizontal *and* vertical direction. Horizontally, it will enlarge our view of situations by expanding the reference systems considered; vertically, it will deepen our understanding of situations by shifting our standpoint and perspective between essentially *different* reference systems.

The three-level concept of rational practice thus translates into a process of *systematic rationality review.* In a deliberate reversal of my earlier-quoted critical comment on the open systems fallacy, systems rationality will then no longer focus exclusively on the "problems of the system" but will instead consider "the system" and the boundary judgments constitutive of it as a core problem of any understanding of "rational" practice.

We've come full circle, back to what Robert Pirsig, in the quote from *Zen or the Art of Motorcycle Maintenance* that serves as a motto for this essay, described as a key confusion of our time**:** "The true system," he wrote, "the real system, is our present construction of systematic thought itself, rationality itself.… There's so much talk about the system. And so little understanding." (Pirsig, 1975, p. 94) Would it be all too presumptuous to hope that we may have lessened this lack of understanding just a little bit?

Notes

1) For a selection of some of my writings on CSH, see, e.g. Ulrich, 1983, 1984, 1988, 1996, 2000, 2001a, b, 2003, 2006a, b, 2007, 2012c, and 2017a-e. The page *Selected Readings on Critical Systems Heuristics* and other sections of my home page provide further hints. *[BACK]*

2) See the subsection *"Boundary critique and the S-E-A-U scheme"* in Part 2 of the previous essay (Ulrich, 2017e, p. 19f) on this issue. There is, then, as a rule, no need for four separate rounds of boundary critique, one for each type of reference systems. Understanding the nature and role of the four reference systems is nevertheless important for a good practice of boundary critique, and there may indeed be occasions on which it makes sense to focus the process of boundary critique on one type of reference system only. *[BACK]*

3) "Normative," a term no longer current in everyday spoken English, means both "having value implications" and, consequently, "being (or needing to be) regulated by norms," the latter furnishing standards of assessment. Accordingly, I call an approach or a methodology *critically-normative* when I recognize it to lend itself to a critical handling of normative issues, including its own normative content; that is, if it offers help not only in stipulating and justifying theoretical or practical propositions but also in rendering them transparent and assessing their value implications for the different parties concerned in specified contexts of application. *[BACK]*

4) Weber's (e.g., 1968a, pp. 6-9, 20f) "ideal-types" represent conceptually pure cases (*Idealtypen*) – in this case, action orientations – that cannot usually be found in social reality but are useful for analyzing it. In comparison to such pure types, actions as we observe them in practice are thus nearly always imperfect expressions – and combinations – of rational behavior. Accordingly, Weber's ideal-types of action are useful not only to understand why people act the way they do but also to gain insight into the *rationality deficits* involved**:**

> They state what course a given type of human action would take *if it were* strictly

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> rational, unaffected by errors or emotional factors and if, furthermore, it were completely and unequivocally directed to [the intended meaning]. In reality … there is usually only an approximation of the ideal type. (Weber, 1968a, p. 9, italics added)

Further, it follows that empirical actions are not simply rational or not; they involve different elements of rationality that each can assume a higher or lower degree of practiced rationality; for example, an agent may intend to act instrumentally rational but fail to do so for emotional or value-rational reasons as well as due to a lack of knowledge (i.e., incorrect means-end calculation). Compare the earlier discussion of Weber's typology of rational action in Ulrich (2012b, pp. 8-14). *[BACK]*

5) It should be clear that although the three-level concept does not assign a rationality level of its own to the fourth reference system, U, the latter is present inasmuch as defining both E and A implies their conscious and careful delimitation against U. The three-level framework does thus involve all four reference systems and all related boundary issues, specifically the two boundary issues to which we have referred as E/U and A/U. *[BACK]*

6) Readers will find a more detailed account that informs the present illustration in a previous discussion of the example of corporate management in Ulrich (2012b, pp. 34-39, esp. 34-35). *[BACK]*

7) This subsection summarizes three previous short discussions of the open systems fallacy in Ulrich (1983, p. 299f; 1988, p. 156f; and 2012b, p. 30f), a concept by which I hope to draw some attention to a rather neglected pitfall involved in so-called "open systems thinking." *[BACK]*

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Picture data Digital photograph taken on 18 January 2010, around 4:30 p.m., above Lake Thun, Switzerland. ISO 100, exposure mode aperture priority with aperture f/3.5 and exposure time 1/1200 seconds, exposure bias -0.30. Metering mode multi-segment, contrast soft, high, sharpness soft. Focal length 14 mm (equivalent to 28 mm with a conventional 35 mm camera. Original resolution 3648 × 2736 pixels; current resolution 700 x 525 pixels, compressed to 153 KB.

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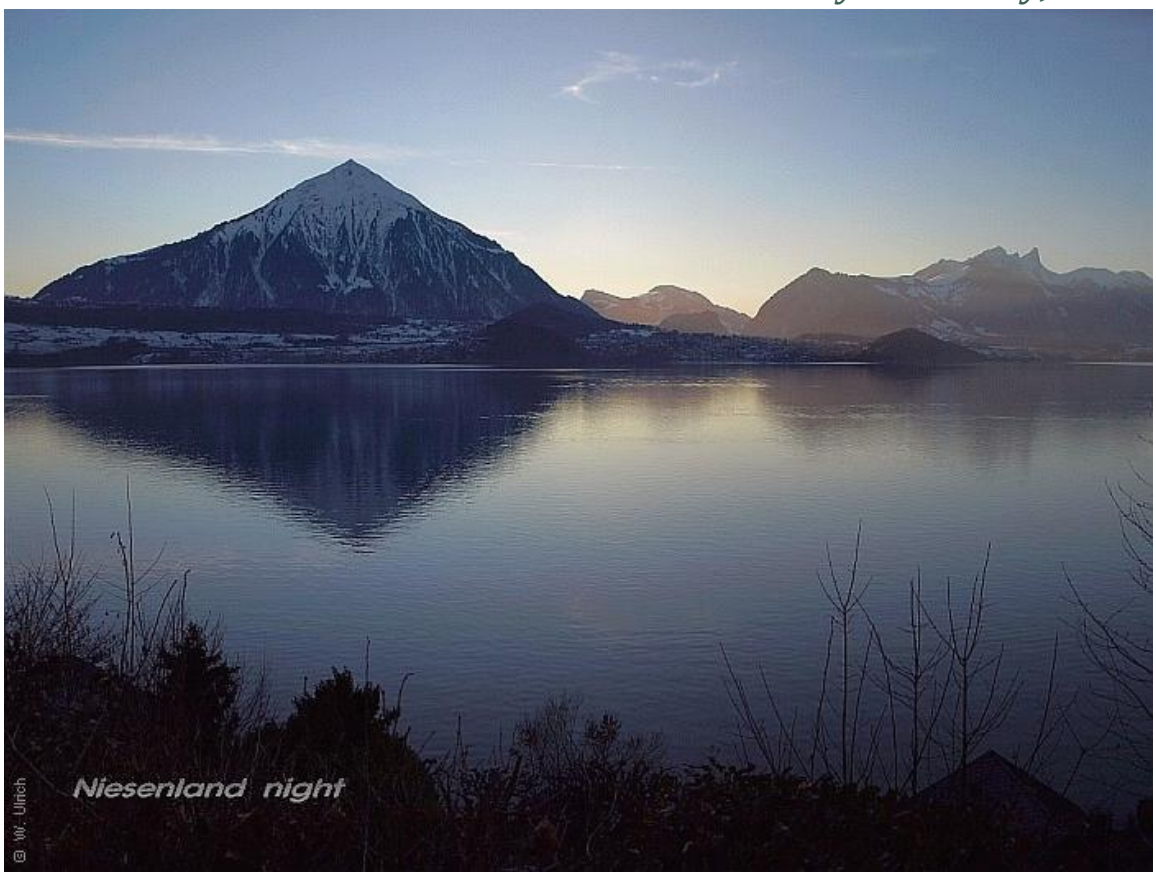

The horizontal and the vertical

„Rationality critique has both a horizontal and a vertical dimension; both matter in boundary critique."

(From this essay on the nature and role of reference systems)

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