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# Extending Rigor and Relevance: Towards Credible, Contributory and Communicable Research

Anders Martensson

*Stockholm School of Economics*, [anders.martensson@hhs.se](mailto:anders.martensson@hhs.se)

P Martensson

*Stockholm School of Economics*, [par.martensson@hhs.se](mailto:par.martensson@hhs.se)

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# EXTENDING RIGOR AND RELEVANCE: TOWARDS CREDIBLE, CONTRIBUTORY AND COMMUNICABLE RESEARCH

Mårtensson, Anders, Stockholm School of Economics, Box 6501, SE-113 83 Stockholm,  
Sweden, anders.martensson@hhs.se

Mårtensson, Pär, Stockholm School of Economics, Box 6501, SE-113 83 Stockholm,  
Sweden, par.martensson@hhs.se

## Abstract

*There are many ways to discuss research quality. This paper aims at presenting an actionable framework for research quality, which can be used as guiding principles for identifying important dimensions when evaluating research. The framework takes its starting point in prior suggestions that research should be rigorous, relevant and consumable.*

*When examining the rigor aspect it is argued that this is a means rather than an end. By being rigorous, research strives to be credible. This also calls for consistency and transparency. Similarly, it is argued that relevance is a means for research to be contributory. To be contributory research also has to be original and generalizable. Research has to be consumable in order to be communicable, but to become a consumed piece of research it must also be accessible.*

*Starting out with the agenda of discussing research being rigorous, relevant and consumable, the paper instead ends up with a call for research being credible, contributory and communicable. By using the dimensions presented in the paper, researchers may increase the quality of research efforts both in research design, as well as research execution and research presentation.*

*Keywords: rigor, relevance, framework, research quality.*

# 1 INTRODUCTION

Within any field of research a natural and thus common question is ‘what constitutes good research?’ How should the research carried out within this particular field be evaluated? Within the field of information management specifically there has been an ongoing debate on this topic for quite some time. A proposed reason for this discussion on of how to evaluate and judge research is the perceived need for establishing the field academically while at the same time being quite practitioner oriented (Robey & Markus 1998).

Research can be evaluated using a multitude of dimensions (see e.g. Gummesson 1991, Mason 1996, Rubin & Rubin 1995, Maxwell 1996, Keen 1991), where different suggested sets of dimensions often are overlapping in different ways. Some focus their discussion on criteria for evaluating some specific kind of research, such as Klein and Myers who present a set of principles “*addressing the quality standards of only one type of interpretive research, namely, the interpretive field study*” (1999, p. 69) and Dubé and Paré (2003) who discuss positivist case research. Others argue that different dimensions are better suited to certain kinds of research than others in general; for instance Rubin and Rubin (1995) argue that validity and reliability are better suited to quantitative research and that they do not fit qualitative research.

When evaluating research a distinction is often made between rigor and relevance (e.g. Keen 1991). It is, sometimes implicitly sometimes explicitly, assumed that there is a trade-off between these concepts. Robey and Markus (1998) argue that researchers should strive to produce research that is both rigorous and relevant, which they call consumable research. This paper argues that consumable research is a property of the research in itself. Thus, research should be rigorous, relevant *and* consumable.

In this paper our aim is to put the concepts of rigor and relevance into their contexts and to present a framework for research evaluation, which can be used as guiding principles for identifying important dimensions when discussing quality of research (Mårtensson 2003). We do not argue this to be “the true” or “the best” framework for doing so. We rather argue that this is one approach to discussing research from a multi-perspective point of view. As information systems (IS) researchers we do this with an IS-discipline mindset drawing on a mix of IS-specific literature and more domain-neutral literature.

The purpose of the framework is to identify important dimensions to consider when discussing and evaluating research rather than to lay out explicit rules. We believe that such rules depend quite significantly on the type of research in focus. For example, positivist and interpretive research are usually evaluated quite differently (see Klein & Myers 1999), but this paper does argue that on one level of abstraction the same dimensions can be applied in both cases.

Discussions on research quality concern both the individual researchers evaluating their own research and reviewers in peer-review situations. Being an actionable framework means that the framework is intended to be used both as a sort of checklist (“is some aspect neglected?”) and a possible structure for discussing the quality of a piece of research. The underlying purpose of the paper is to extend the discussion on research quality beyond the concept of rigor and relevance, by considering these as means rather than ends and to consider the larger context.

## 2 RIGOROUS RESEARCH?

The first question to ask when discussing rigorous research is: *What is rigorous research?*

Two concepts often highlighted when discussing quality of research in a broad sense are *validity* and *reliability*. Most methodological textbooks discuss these concepts and how they can be applied (e.g. Kirk & Miller 1986, Gummesson 1991, Silverman 1993, Miles & Huberman 1994).

Validity means that a piece of research should closely reflect what is actually measured or explained, or put differently: “*Judgements of validity are, in effect, judgements about whether you are ‘measuring’, or explaining, what you claim to be measuring or explaining*” (Mason 1996, p. 146). Typical tests of validity is referred to as type I errors, i.e. believing a statement to be true when it is not, and type II errors, rejecting a statement which is true (e.g. Silverman 1993). Here things get more complicated if submitting to an underlying view of science that there is no objective truth and that the world is socially constructed (cf. Berger & Luckmann 1966).

Reliability means that two researchers studying the same arena would come up with compatible observations (e.g. Miles & Huberman 1994, Rubin & Rubin 1995). Here things also can get complicated depending on the view of science and in an interpretive setting it may be difficult to argue that two researchers would come up with the same results.

As indicated above, one can raise concerns about the applicability of the concepts of validity and reliability in more interpretive research settings. Validity and reliability are rooted in a positivistic and quantitative research tradition and do not perfectly fit qualitative interpretive research. Reliability carries notions from quantitative research and deals with quality of the research tools or instruments and the measurements they provide. In qualitative research the concept of “tools” is more complex, as the researcher usually is more actively involved.

In fact, when trying to apply the concepts mechanically to qualitative pieces of research it may distract more than clarify (Rubin & Rubin 1995). It is worth noting that positivistic research does not have to be quantitative. Similarly, interpretative research does not have to be qualitative. Furthermore, Lee (1991) even argues that positivist and interpretive research can in fact be integrated.

Nevertheless, it is important to find ways of discussing the quality of research from a rigor perspective. Keen (1991) brings a slightly different perspective when discussing the rigor of research, when he stresses the importance of placing the study in an intellectual context in addition to its reliability and internal validity. This line of reasoning is supported by Maxwell (1996) who includes *conceptual context* as a vital component of research study design. The intellectual context criteria means that research in some fashion must relate to existing knowledge, i.e. it is not enough to have reliability and being internally valid. By bringing these three concepts together, i.e. validity, reliability, and conceptual context, we can address the question of what rigorous research really is, as described in Figure 1 below.

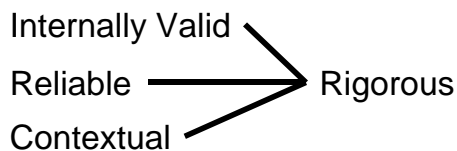


Figure 1. *Dimensions Building up Rigorous Research*

The second question to ask when discussing rigorous research is: *Why rigorous research?*

Is it at all important that research is rigorous? One answer is that yes, it is important and it is important in order to gain *credibility*. It is important in the sense that it should allow a reader to judge if the

research can be trusted or not (or indeed the researcher). Research being rigorous is not a goal in itself. Instead it is a means for achieving credibility. A rigorous piece of research can be trusted.

From this follows a third question: *What is credible research?*

Taking the rigor aspect for granted, the question is what else is needed for research to be credible. Based on Shipman (1982), Gummesson (1991) suggests that the research process has to be transparent enough for the consumer to assess the credibility of the research. Transparency is needed for the reader to be able to judge the rigor of the research. Rubin and Rubin (1995) suggest transparency and consistency-coherence.

*“Transparency means that a reader of a qualitative research report is able to see the basic processes of data collection”* (Rubin & Rubin 1995, p. 85). This is very much in line with Gummesson’s credibility concept despite their apparent disagreement on other criteria.

*Consistency-coherence* deals with the extent to which inconsistencies in the empirical data are understood (rather than eliminated). Rubin and Rubin claim that *“A credible final report should show that the researcher checked out ideas and responses that appeared to be inconsistent”* (1995, p. 87). The goal is not to eliminate inconsistencies but to understand why they occur (ibid.).

Bringing these concepts together we can address the question of what credible research really is, as described in Figure 2 below.

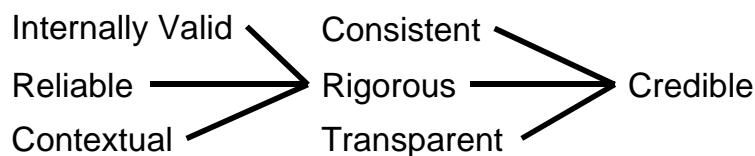


Figure 2. *Dimensions Building up Credible Research*

Figure 2 above illustrates the concept of *rigorous research* put in a wider context. First the figure illustrates three basic concepts building up to what rigorous means. Then the concept of rigorous is put in the perspective of being the means, not the end in itself. Instead *credible* research is the goal to achieve. But there are also additional dimensions building up to credible research. Research should not only be rigorous, but also consistent and transparent, in accordance with the discussion above.

Having extended and put the traditional concept of rigorous research in a wider context, and instead advocated credible research, we now turn to the concept of relevant research.

### 3 RELEVANT RESEARCH?

The first question to ask concerning relevant research is: *What is relevant research?*

Traditionally, the focus has been on the rigor of the research rather than its relevance (Benbasat & Weber 1996, Robey & Markus 1998). Keen’s opinion is very clear as he states that *“Until Relevance is established, Rigor is irrelevant. When relevance is clear, rigor enhances it.”* (1991, p. 47). As argued by Robey and Markus (1998), there is no inherent conflict between the concepts of rigor and relevance, i.e. there is no need for a trade-off to be made.

In order to increase the relevance of research, Keen claims that one has to add the questions “why?” and “for whom?” to the more traditional “what?” and “how?” (Keen 1991). Relevance has been further specified by Benbasat and Zmud (1999) into the dimensions described in Table 1 below, where the first three dimensions are content related and deal with the nature of the contribution, while the fourth rather deals with presentation style.

Dimension	Description
Interesting	Does the research address problems or challenges that are important to IS professionals?
Applicable	Can the results (i.e. knowledge and prescriptions) be utilized by practitioners?
Current	Does the research address current (at the time of publication) technology and business issues?
Accessible	Is the research presented in an understandable way for IS professionals?

Table 1. *Dimensions of Relevance (Benbasat & Zmud 1999)*

By bringing these three content-related concepts together, i.e. interesting, applicable, and current, we can address the question of what relevant research really is, as described in Figure 3 below. The fourth concept, accessible, will be dealt with later.

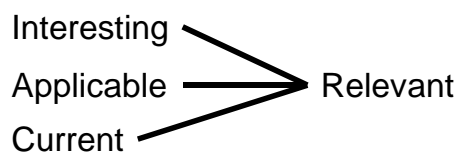


Figure 3. *Dimensions Building up Relevant Research*

The second question to ask when discussing relevant research is: *Why relevant research?*

In the same way that the rigor of research is not an end in itself, neither is the relevancy. It is important that research is relevant so that it can make a *contribution* to something or someone. If one does not seek to contribute to something it hardly matters if the research is relevant. Thus, relevancy concept can be extended and instead be seen as a means to contribute.

From this follows a third question: *What is contributory research?*

One immediate aspect is whether the research in some sense is original or not. This does not mean that replication studies cannot be contributory (see Berthon et al 2002). A replication study can in fact contribute quite significantly since it adds value to the initial study.

Another important aspect of research aspiring to contribute is its generalizability (e.g. Gummesson 1991). Mason (1996) suggests two ways of thinking about generalization: empirically and theoretically. Empirical generalization extends findings from one empirical population (the studied sample) to a wider population based on the argument that the sample in some sense was representative of the wider population. Theoretical generalization on the other hand extends findings to theoretical propositions rather than to populations (Yin 1994). Lee and Baskerville (2003) also discuss different forms of empirical and theoretical generalization.

By bringing these concepts together we can address the question of what contributory research really is, as described in Figure 4 below.

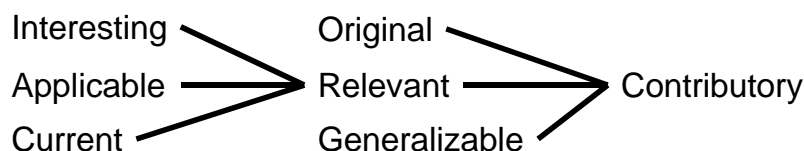


Figure 4. *Dimensions Building up Contributory Research*

Figure 4 above illustrates the concept of *relevant research* put in a wider context. First the figure illustrates three basic concepts building up to what relevant research means. Then the concept of

relevancy is put in the perspective of being the means, not the end in itself. Instead *contributory* research is the goal to achieve. But there are also additional dimensions building up to contributory research. Research should not only be relevant, but also original and generalizable, in accordance with the discussion above.

Having extended and put the traditional concept of relevant research in a wider context, and instead advocated contributory research, we now turn to the third and final proposed aspect, whether the research is consumable or not.

## 4 CONSUMABLE RESEARCH?

So far the common criteria rigor and relevance have been placed into the larger contexts of research being credible and contributory. It is, however, argued that it is not even enough for research to be credible and contributory. As researchers we should also strive for our research to be consumable Robey and Markus (1998) or to reverberate (Desouza et al 2006). In fact, sometimes it is even argued that reverberation is more important than rigor and relevance (ibid.).

The first question to ask when discussing consumable research is: *What is consumable research?*

Robey and Markus (1998) argue that research should be consumable and they advocate practitioner sponsorship, new models of research, producing consumable research reports, and supporting non-traditional publication outlets as tools for producing research consumable for practitioners. They (ibid) frame consumable research as research where relevance and rigor are combined. This paper argues that consumable research refers to whether the research is easily consumed, regardless of whether it is rigorous and relevant. This argument is indeed supported by Robey and Markus' discussion on how to produce consumable research which deals more with how to make the research easily consumed than how to combine rigor and relevance.

The second question to ask when discussing consumable research is: *Why consumable research?*

A short answer to the question is that all the tools mentioned above serve to decrease the gap between traditional rigorous academic research on one hand, and research that is consumable for, and consumed by, practitioners on the other hand. A *consumable* piece of research is not the same as a *consumed* piece of research. By being consumable there is a possibility that research will also be consumed, but the research needs to be communicable.

From this follows the third question: *What is communicable research?*

One aspect of being communicable is the accessibility, presented in Table 1 above, which is addressed in Figure 5 below (cf. Benbasat & Zmud 1999), i.e. the research is presented in a way that IS professionals understand and would enjoy reading. Rubin and Rubin discuss the communicability of research and emphasize that "*The portrait of the research arena that you present should feel real to the participants and to readers of your research report*" (1995, p. 91). Robey and Markus' (1998) discussion on non-traditional publication outlets can also be seen as an accessibility issue.

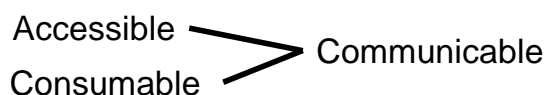


Figure 5. *Dimensions Building up Communicable Research*

Being consumable is an important aspect of research, but once again it is argued that this is more of a means than an end. Research should be consumable in order for it to be communicable, but it must also be accessible.

## 5 CREDIBLE, CONTRIBUTORY AND COMMUNICABLE RESEARCH

In the previous three sections we have discussed the concepts of rigorous research, relevant research and consumable research. We have illustrated how these concepts can be seen as means rather than ends, and therefore suggested the three “C-concepts” as the ends: Credible research, Contributory research and Communicable research. But one could also regard these concepts as means to an end which could be described as “Good Research”. Of course, “Good Research” can in turn be considered a means to a higher end and so on. This quite philosophical question is however not dealt with in this paper.

Putting together the three pieces discussed above, produces a model for describing “Credible Contributory Communicable research”, see Figure 6.

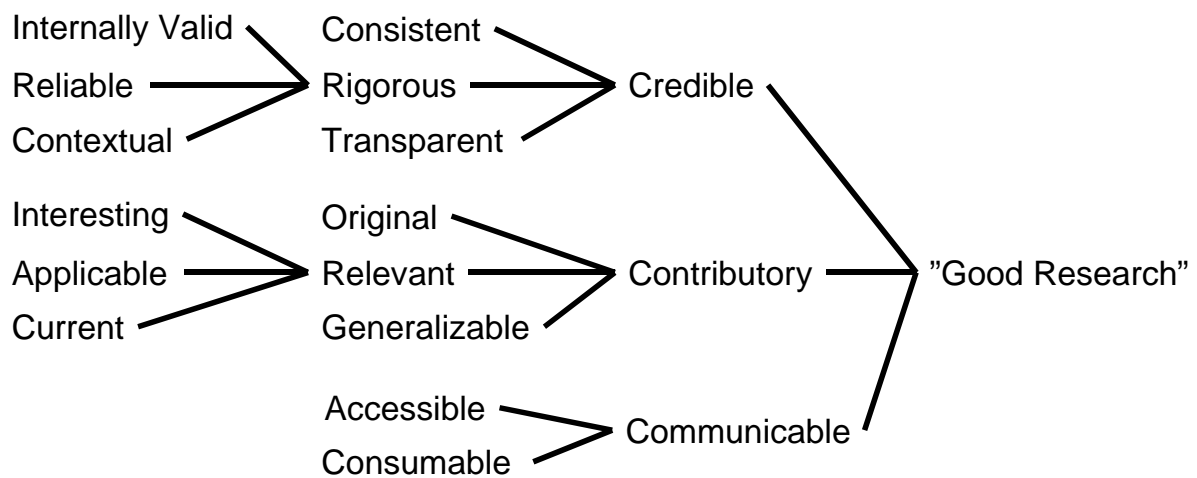


Figure 6. *The Framework for Research Evaluation*

As soon as one starts discussing “good research”, an attendant question is “according to whom and by what criterion”? (e.g. Lundeberg 1993). As discussed above, the framework presented in Figure 6 suggests a number of important dimensions when addressing this question.

Determining whether a piece of research is, e.g. generalizable, is beyond the scope of this framework due to the amount of contingencies such as the type of research and personal preferences of the evaluator. Thus, this framework aims not at settling what is “good research” and not. It does, however, aim at suggesting proper dimensions when judging whether a piece of research is good or not. It is argued that agreeing on the dimensions used makes any discussion on the merits of a particular piece of research more fruitful

## 6 CONCLUDING REMARKS: ACTIONABLE KNOWLEDGE

Rigor and relevance are two fundamental concepts when discussing research and its quality. As we have outlined in this paper much can be gained by putting these concepts in a larger context. This can be done in two different dimensions: first by considering rigor and relevance as means to ends, second by broadening the discussion about other supplementing means for reaching these ends. As discussed above the concepts of credible, contributory and communicable are suggested as ends, i.e. for capturing and describing “good research”:

- Credible – Can I trust this piece of research?
- Contributory – Does it contribute to my understanding or knowledge of something?



- Communicable – Will I ever come across, read and understand this piece of research?

Until research is communicated the first two questions become hypothetical (“Would I trust...”, “Would it contribute...”).

Let us now get a taste of our own medicine. Given that someone has come across, read and understood this particular piece of research on rigor and relevance, what can we learn from this, and how can we use this framework?

The framework presented in Figure 6 provides an easily applicable set of dimensions which can be used in least three different situations. First, the framework provides a set of dimensions useful when *designing research studies*. By checking that the dimensions are reasonable well covered, researchers may increase the quality of their research efforts both in actual research execution and in research presentation. Second, the dimensions in the framework can offer an actionable set of dimensions to cover when *evaluating research*, e.g. in a review process. Third, the framework can help elaborating *general quality discussions* on what is “good research”. Often researchers discuss the quality of their research by, more or less mechanically, applying the concepts of validity and reliability only to find that “yes”, their research is both valid and reliable. Nothing would please us more than if the framework suggested in this paper could at least entice more sincere discussions on the matter of research evaluation.

In terms of being generalizable, the framework has been developed with an IS-discipline mindset, but given its abstract nature we do not see inherent restrictions preventing its use also in other disciplines should non-IS researchers find it useful. Of course, to what extent the framework would be contributory in a specific (non-IS) field of research will depend on whether it will be relevant in this field. Would it for instance address current and interesting questions in that field? A weakness of this research if applied in non-IS domain would be its lack of conceptual context since this paper does not relate to on-going discussions in non-IS domains.

That being said, there are many ways going about evaluating research. In a travesty of the old story (see Weick 1979) of the three home plate umpires, a first evaluator would argue that research should be evaluated as it is. The second evaluator would argue that what should be evaluated is what people have actually learned from the research. Our third evaluator, finally, would argue that what should be evaluated is whether the research actually matters to her. Despite their various approaches to research evaluation, our three evaluators would probably agree that evaluation is a fundamental aspect of research. The proposed framework can help evaluating research: both at a planning stage when designing studies, and after concluded studies to be published, as well as on a more general level on quality in research.

It is our firm belief that applying the dimensions suggested in the framework increases the chances of actually producing credible, contributory and communicable research.

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