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CONTEMPORARY EPISTEMOLOGY AND IS METHODOLOGY: AN INTERPRETIVE FRAMEWORK

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Abstract

This paper describes work utilizing some of the philosophical concepts employed in contemporary epistemology; these concepts have been utilized to develop a framework for interpreting the role that should be played by IS methodologies in IS development in contemporary organizations. It will be argued that in choosing an IS methodology, relevance should determine the conduct of inquiry; in using IS methodologies, rigor will stem from the existence of adequate justification for the requirements elicited by the practitioners. It is concluded that both “hard” and “soft” approaches to IS development, whilst respecting their differences in approach, can usefully be interpreted within this framework - although softer approaches have the advantage in that they have always emphasized the human dimension of IS development. Although the terms ‘relevance’ and ‘rigor’ are used herein they are not used in quite the same sense as they are used in the IS research debate concerning relevance and rigor (as will be discussed).

Introduction

As Loucopoulos and Karakostas argue, “Information systems are entering a new phase, moving beyond the traditional automation of routine organizational processes and towards the assisting of critical tactical and strategic enterprise processes. Development of such systems needs to concentrate on organizational aspects, delivering systems that are closer to the culture of organizations and the wishes of individuals.” (Loucopoulos and Karakostas 1995, p. 4). Clearly, such demands are difficult to achieve in practice. Over the past twenty years or so there has been a considerable growth of interest in IS development methodologies. Also, unsurprisingly, (given the above remarks) there has been a steady growth in interest in softer methodological approaches – more attuned to the social needs of the organization than the technical aspects of IS development. One result of the growth of interest in (and use of) methodologies has led to a new set of problems for IS practitioners; two of which will be considered herein. Let us call the first problem the problem of (IS) methodological rigor. Simply stated, this problem concerns the degree to which a IS practitioner needs to adhere to the prescriptions of the chosen methodology, i.e. should he/she use a cookbook or a toolkit approach. Academically, it is worth qualifying this problem somewhat, as different methodologies – indeed different versions of the same methodology – have tended to give different prescriptions in (precisely) this respect. Fidler and Rogerson neatly capture this notion with the phrase, “The rule prescriptiveness of the methodology” (Fidler and Rogerson 1996, p. 269). It will be argued below that, regardless of the rule prescriptiveness of the methodology, the extent to which a IS practitioner follows the precise prescriptions of a (highly rule-prescriptive) methodology remains a matter of choice for the IS practitioner. Furthermore, there is considerable evidence to support the view that such choices are frequently made, e.g. as Jayaratna concludes:

“The structure, steps, models, values and philosophy of the methodology-in-action may very well be different from either those explicitly outlined in the methodology (creators’ rationale) or those that were interpreted and changed by the methodology users in the context of their own ‘mental constructs’ (methodology users’ rationale) before intervention. This is because a methodology has to match the dynamic nature of the situation and the interactions of the methodology users in the situation.” (Jayaratna 1994, p. 229)

As the practical choice as to whether to use a methodology in a cookbook or a toolkit manner remains largely open, this paper will focus on this issue. The second problem concerns that of methodology choice and the movement between methodologies (within the same IS project). Let us call the second problem the problem of IS methodology relevance. A considerable literature has built-up in recent years to help practitioners with this problem (e.g. Jayaratna 1994), and this paper will not revisit this territory. However, what will be argued is that the problem of (IS) methodological rigor and the problem of IS methodology relevance are epistemologically related; they are “two sides of the same coin”. Consequently, whilst the main focus of this paper
Concerns the problem of (IS) methodological rigor, many of the arguments may help to inform the debate on the problem of IS methodology relevance.

Although the paper utilizes (some aspects of) contemporary epistemology, the requisite concepts and arguments will only be introduced where appropriate. This is a broad area of philosophy, and – in a short paper such as this – it has been necessary to be selective in this respect. However, by keeping the philosophical discussion to a minimum, it is hoped that relevance can be emphasized without a serious loss of philosophical rigor! Although the terms ‘relevance’ and ‘rigor’ are used herein they are not used in quite the same sense as they are used in the IS research debate concerning relevance and rigor. I take the research debate to be one concerned with the comparative merits of research leading to interesting and (possibly) insightful generalizations, or abstractions, (relevance) versus research leading to well-grounded but strongly-bounded particularities (rigor). It is tautological to say it, but that debate relates to academic research (termed ‘theory’ in Figure 1 below). This paper is concerned with IS development (termed ‘practice’ in Figure 1 below); here relevance relates to appropriateness in a particular situation (e.g. a Hospital in England, a Power Plant in the Ukraine, a DotCom in California, etc.). Here, rigor relates to broad principles that apply in any (IS development) situation, i.e. they are generalized abstractions. Using the more traditional philosophical term ‘ universals’, rather than ‘abstractions’ or ‘generalizations’, these notions can be summarized in the figure (p.s. apologies for the rather crude examples!).

Contemporary Epistemology and IS Methodology Relevance

In contemporary epistemology, an important distinction can be made between our criteria for justification for our belief-sets and prescriptions relating to the conduct of inquiry (for adding to our “stock” of beliefs).

Criteria for Justification

Our criteria for justification will often be based on some notion that what we believe, we believe for “good reasons”. A crude example would be the dictum that “seeing is believing”. Whilst not adequate in all situations (such as during a Magician show), seeing something (x) occurring generally provides a better justification for believing (that x occurred) than e.g. hearsay. In contemporary epistemology, this would be termed a foundational criterion for justification – as it is based on isolated occurrences, which we would claim to be fairly certain about. We might use some such phrase as “I believe x occurred because I saw it happening.” in order to justify our belief that x occurred. However, another approach to justification is termed coherence. This approach is holistic, in that it requires that all our beliefs “cohere”, i.e. that they do not contradict each other. We might use some such phrase as, “Everything I know about macroeconomics tells me that we have not abolished the business cycle.” in order to justify our belief (i.e. after a sustained period of economic growth an economic downturn was inevitable. Such a belief would not be justified on any “direct” foundational evidence, but rather by the totality of our beliefs (and previous foundational evidence) pertaining to macroeconomics.

In IS analysis, beliefs are generally justified by foundational arguments, but we can (and, I would argue, should) use techniques such as cross-referencing between different models (etc.) to check that our beliefs – about how a particular organizational IS functions – are correct. In practice, it is often necessary to obtain further foundational evidence (i.e. “go back to the users”) if our belief sets do not cohere. A (somewhat crude) example would be: suppose that Accounts had told us that “No goods are ever ordered unless a Purchase Order had been raised.”, whereas Purchasing had told us that “Sometimes goods are obtained without a Purchase Order being raised.”. Both beliefs would be foundationally justified – but they are not coherent. Further investigation would be required until we could reach a belief-set that was justified both foundationally and coherently. At any rate, IS methodologies should emphasize a rational, mature approach to the justification of beliefs about an IS:

“The goal of inquiry is substantial, significant, illuminating truth; the concept of justification is specifically focussed on security, on the likelihood of beliefs being true. Hence my claim that truth-indicative is what criteria of justification need to be to good… [But] Even if our criteria of justification are truth-indicative, to reach the conclusion that our beliefs are mostly true would require the further assumption that our beliefs are mostly justified. But people have many beliefs in which they are not justified, or are justified to only a very
modest degree. Superstition, wishful thinking, self-deception, jumping to conclusions, and so forth, are not, after all, so rare.” (Haack 1993, p. 203)

In a sense, the very point of IS methodologies is to provide adequate, rational, defensible justification for the nature, scope and functioning (etc.) systems that are developed as a result of using an IS methodology. As Jayaratna put it, “Methodologies exist to help us in our reasoning. They attempt to raise our conscious thinking, to make us question the rationale of our planned action and to guide us in the transforming of situations.” (Jayaratna 1994, p. xii). Furthermore, there is a welter of evidence to support the view that correctly understanding the operation of the current system and the users’ requirements is crucial to the development of successful information systems. The models developed for the design of a new IS will need to be both (internally) coherent and (foundationally) justified by the users’ requirements.

**Conduct of Inquiry**

Precisely how analysts come to arrive at such models is a different matter; not less important, but less rigidly definable and more open to variations – such that the varieties of organizational circumstances, in which a particular IS is to be developed, can be adequately catered for. Interestingly, Haack argues that this principle is true for all human inquiry in general:

“… It is doubtful whether it is possible to give rules - as opposed to guidelines, the application of which requires judgement or discretion – for conducting inquiry… the ‘conduct of inquiry’ project is likely to be more hospitable to pluralism, for there may well be different, equally good, ways of proceeding in inquiry – indeed it may well be that the best thing is for different inquirers to proceed differently; whereas pluralism with respect to criteria of justification … is not possible.” (Haack 1993, p. 204)

Consequently, it is no real surprise that both hard and soft IS methodologies have similarities at the level of (how to go about) rational justification – lots of interaction with the users and such like, and no surprise that they have radically different recommendations for the conduct of inquiry - different models with different interpretations as to the purpose of modeling etc. Also, on this basis, new ideas for the conduct of inquiry (i.e. new IS development methodologies) can be cautiously welcomed providing that it can be shown that their criteria for the justification of their (intermediate and final) products adequately meet the criteria proposed (or, rather, endorsed) herein. Interestingly, in this respect there is sufficient common epistemological ground between hard and soft approaches to allow movement between hard and soft approaches, as the organizational circumstances dictate. A systems analyst may choose whichever approach he or she sees fit, and/or consult some texts to decide which methodology to choose in the circumstances pertaining, (e.g. Hirschheim et al. 1995) without committing themselves to a radically different epistemological basis – at least insofar as rational justification is concerned.

**Conduct of Inquiry Versus Criteria of Justification**

Haack developed a table to indicate the desirable features of “projects of devising guidelines for the conduct of inquiry” and for “the project of explicating / ratifying criteria of justification”. These are summarized below (adapted from Haack 1993):

<table>
<thead>
<tr>
<th>“Conduct of Inquiry”</th>
<th>“Criteria of Justification”</th>
</tr>
</thead>
<tbody>
<tr>
<td>More hospitable to pluralism</td>
<td>Oriented to truth</td>
</tr>
<tr>
<td>More recalcitrant to precision</td>
<td>Focused on security of belief</td>
</tr>
<tr>
<td>Guidelines, not rules</td>
<td>Focused on likelihood of belief</td>
</tr>
<tr>
<td>Require discretion, good epistemic character</td>
<td>Focused on truth-indicativeness of belief</td>
</tr>
<tr>
<td>Social dimension important</td>
<td></td>
</tr>
</tbody>
</table>

These considerations can help us to evaluate IS methodologies in the following way. For any particular IS methodology, we may simply substitute Haack’s conduct of inquiry guidelines, with exception of the requirement (1), which (I would suggest) should be replaced with, “that any particular methodology – and especially a new methodology - should be sufficiently novel and distinct from other methodology with respect to guidelines (2) through (5) to warrant our attention and interest”. Moreover, we may ask how any IS methodology meets Haack’s criteria of justification; for if it fails to do so then, I conclude, its use should not be advocated. Furthermore, if one examines the conduct of inquiry guidelines one can easily provide a theoretical argument concerning the undesirability of slavishly applying an IS methodology in a “cookbook” manner. Not only should movement between hard and soft methodologies be encouraged by the above analysis, but “cookbook” uses should be actively discouraged.
The appeal of a “cookbook” approach rests on the inability to make an important distinction between how to conduct an inquiry and what the criteria of justification for the products of a IS development project are to be; consequently it violates the freedom a IS practitioner needs to adapt his or her processes of inquiry to the actual needs of the project:

“… [C]oncerns about justification are focused on one dimension, specifically, of the goal of inquiry … This is not to suggest that the two kinds of epistemological project here distinguished are unrelated … It is only to insist that, though related, they are distinct. But it is the distinctness of the two projects that needs emphasis here, because they have frequently been run together.” (Haack 1993, pp. 203-204)

In IS development methodologies (and, in particular, in their “theoretical underpinnings”), the consequences of “running these projects together” will result in a failure to discern the real differences between using a methodology in “toolkit” mode and in “cookbook” mode. A cookbook approach, similar to that described in Wastell (1996), will not result in improved justification for the models developed. A toolkit approach is not epistemically sloppy; rather it can now be seen as being (generally) epistemically desirable. Methodologies such as Soft Systems Methodology (Checkland and Scholes 1990; Checkland and Holwell 1998) have always recognized as much. Of course, there will be appropriate cases where a near-cookbook approach to methodology-use can sensibly be advocated. An inexperienced practitioner, with little or no opportunity to call on the resources of more experienced IS practitioners, may well do better with a cookbook approach – rather than no methodological approach at all. Moreover, there will always be phases / stages / tasks in a project where a near cookbook approach is the only practical approach available, e.g. if a IS practitioner decides to use a technique like normalization. However, even here, the “depth” to which a practitioner may “delve down” may be a matter of practical significance and choice:

“The normalization process is often described in terms of stages known as first, second, third, fourth and fifth normal forms (1NF-5NF)… fifth normal form deals with a rather unusual situation known as join dependency which is of little practical significance.” (Howe, p. 87)

So, generally speaking, the practical significance of methodological prescriptions should determine which aspects of a methodology - even of near-cookbook process within a methodology – are actually performed.

**Conclusion**

In choosing a methodology, relevance should determine the conduct of inquiry; in using methodologies, rigor will stem from the existence of adequate justification for the requirements elicited by the practitioners. However, it can be concluded that practitioners should be given (by project managers, etc.) considerable freedom to choose approaches to IS development that – from their perspective - suit the pertaining organizational circumstances. Furthermore, it may often be necessary for practitioners to move between (broadly-based) hard and soft, and near-cookbook and near-ad hoc approaches in many IS development projects – as the practicalities dictate. Iteration between phases and cross referencing should be encouraged, at least as far as the time-constraints of a particular IS development project allow. Finally, it should be noted that whilst this paper has gone some way to providing a coherent framework for interpreting practical action in IS development, Jayaratna’s advice to the practitioner, “Not to hand over his or her thought processes to be directed by any external person, model, methodology or framework, including the one advocated in this [1994] book. Methodology users must become responsible for their thinking and actions.” (Jayaratna 1994, p. xiii) is pertinent here, as his comments apply to this paper also.

**References**


