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The dual imperatives of action research

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Keywords Information systems, Research, Methodology, Action research

Abstract Action research (AR) is not without its critics, and those who reject some of the paradigmatic assumptions embodied in AR maintain that AR is little more than consultancy, that it is impossible to establish causal relationships, that it is difficult to generalize from AR studies, that there is a risk of researcher bias, and that generally speaking, it lacks some of the key qualities that are normally associated with rigorous research. The authors are sensitive to such criticisms, for although they are committed action researchers, they have elsewhere voiced their concerns about the quality of AR practice in the field of information systems. The authors argue that part of the issue concerns the way in which we currently conceptualize AR. In this article, the argument for a deeper and more reflective analysis of the meaning and full implications of AR is developed, culminating in a model of AR being developed that explicitly includes both a problem solving interest cycle and a research interest cycle. Important implications of this new model are articulated, with examples to illustrate these points being drawn from a real-life AR study.

Introduction

For some time, information systems (IS) researchers have been encouraged to consider action research (AR) as a suitable candidate research approach among the repertoire of methodologies embraced by the discipline (West *et al.*, 1995). AR has many features which would tend to suggest it is ideally suited to the study of information systems, a point supported by Avison *et al.* (1999), who argue that AR has already had a significant impact on practice within the IS profession. However, in recent times, concerns have emerged in the literature about the practice of AR. Stowell *et al.* (1997) and Lau (1997) point out that there is little guidance for the researcher on how to conduct AR. McKay and Marshall (1999a) argue that there has been scant attention paid to the reporting of the AR process itself (as opposed to the context and content of the AR study), and question whether there has been sufficient academic scrutiny of the AR process and its underpinning data collection and analysis techniques. If AR is to be accepted as a serious vehicle for the conduct of research in IS, then it would seem reasonable that steps are taken to improve the practice of AR.

In this article, the authors argue that part of the problem with AR stems from a lack of clarity in the way some researchers think about AR. The dominant model of the AR process presented in the literature is a cyclical approach to research. Arguments will be developed throughout this paper that suggest that it may be more helpful and enlightening for researchers rather to conceptualise AR as consisting of two, interlinked cycles. Thinking of AR in this way would then have implications for the process adopted in AR, and thus

also on the learning and research outcomes that may ensue from an AR intervention.

The article will commence with a consideration of the characteristic features of AR, its strengths as an approach for IS research, and some of its limitations. From there, it will present arguments to support a change in conceptualisation about AR, and will then discuss the implications of these changes.

The dual
imperatives of
action research

What is action research?

There is a sense in which the very essence of AR is encapsulated within its name: it represents a juxtaposition of action and research, or in other words, of practice and theory. Thus, as an approach to research, AR is committed to the production of new knowledge through the seeking of solutions or improvements to “real-life” practical problem situations (Elden and Chisholm, 1993; Shanks *et al.*, 1993). However, it is more than just another approach to problem solving, for the action researcher is working from within a conceptual framework (Checkland, 1991; Baskerville and Wood-Harper, 1996) and actions taken to ameliorate a situation perceived as problematic should form part of and stem from strategies for developing, testing, and refining theories about aspects of the particular problem context (Avison, 1993; Susman and Evered, 1978).

One distinguishing feature of AR is, therefore, the active and deliberate self-involvement of the researcher in the context of his/her investigation. Unlike the methods of objectivist science where the researcher is argued to be an impartial spectator on the research context (Chalmers, 1982), the action researcher is viewed as a key participant in the research process, working collaboratively with other concerned and/or affected actors to bring about change in the problem context (Checkland, 1991; Hult and Lennung, 1980). Collaboration between researcher and what may be described as the “problem owner” is essential to the success of the AR process. A mutual dependence exists in that both researcher and problem owner are reliant on the other’s skill, experiences, and competencies in order for the research process to achieve its dual aim of practical problem solving and the generation of new knowledge and understanding (Hult and Lennung, 1980). In particular, the researcher brings an intellectual framework and knowledge of process to the research context: by contrast, the problem owner brings knowledge of context (Burns, 1994). Thus AR evolves, in part at least, as a function of the needs and competencies of all involved (Susman and Evered, 1978), with a key feature of this research approach being a willingness to share and thus learn, a result of which is enhanced competencies of all concerned (Hult and Lennung, 1980).

Underlying the AR process, therefore, is a rejection of many tenets of more traditional approaches to research which are embodied in the scientific method. The methods of natural science are viewed as both problematic and indeed, inappropriate, when applied in “human” disciplines such as IS, for intelligent human agents can (and tend to) take action which can effect both the phenomena under study and the outcomes of the research (Checkland, 1991).

“Facts” in a social context are viewed as being given existence by as well as interpreted within some socially constructed framework of understanding (Avison, 1993). Hence, any scientific or systematic investigation of a social context cannot be regarded as value-free (Elden and Chisholm, 1993), nor can it be divorced from the situational and historical context in which it is given meaning (Hult and Lennung, 1980).

Given these features, a fulsome (albeit cumbersome) definition of AR is offered by Hult and Lennung (1980) who write that:

Action research simultaneously assists in practical problem-solving and expands scientific knowledge, as well as enhances the competencies of the respective actors, being performed collaboratively in an immediate situation using data feedback in a cyclical process aiming at an increased understanding of a given social situation, primarily applicable for the understanding of change processes in social systems and undertaken within a mutually acceptable ethical framework.

Within IS therefore, AR offers many positive features thus rendering it a powerful tool for researchers who are interested in finding out about the interplay between humans, technology, information, and socio-cultural contexts. For example, unlike other research approaches, such as laboratory experiments, which struggle to maintain relevance to the real world, the “laboratory” of AR is the real world, thus avoiding the potential separation of research and practice (Baskerville and Wood-Harper, 1996, Susman and Evered, 1978; Avison and Wood-Harper, 1991). Indeed, it could be argued that in applied disciplines such as IS, AR appropriately establishes action and practice as being the prime focus of research efforts (Shanks *et al.*, 1993). It is ideally suited to gaining understanding of whether technology or methodology is perceived useful and helpful in practice, what problems and issues are perceived to arise, and to identify how practice can be improved within the value system of the problem owner (Avison, 1993).

Its dual aim of being both a mechanism for practical problem solving and for generating and testing theory provides a win-win scenario for both researcher and participants in an AR study (Elden and Chisholm, 1993). In addition, AR is viewed as a means for enhancing the skills and competencies of both the researcher and the participants (Hult and Lennung, 1980). Its explicit requirement that an object of inquiry should not be divorced from the context in which meanings are ascribed supports a more holistic understanding of phenomena in changing contexts (Hult and Lennung, 1980).

Nonetheless, AR is not without its weaknesses as a research approach, nor is it without its critics. Arguments are expressed, for example, which suggest that AR may be regarded as being little more than consultancy (an issue raised in Avison, 1993). When interventions are deemed successful, some would argue that causal connections and explanations cannot be safely made (Baskerville and Wood-Harper, 1996). Researchers are questioned over a perceived lack of impartiality and bias (Avison and Wood-Harper, 1991). The supposed lack of scientific rigour and discipline in AR, the lack of validity of data (Baskerville and Wood-Harper, 1996), and the difficulty of generalising results from AR

studies have lead to it falling into disfavour in those academic circles which evaluate research according to scientific criteria. In such quarters, action researchers may find it difficult to attract research funds (Avison and Wood-Harper, 1991).

The context of much IS research suggests that the strengths of AR may be regarded as more important and significant than its weaknesses, particularly when evaluated against other research approaches and paradigms. However, the practice of AR remains somewhat enigmatic, as there are comparatively few guidelines for would-be action researchers to follow. While much of the AR literature is replete with discussions and argumentation about origins, philosophical and conceptual underpinnings, there are relatively few AR exemplars available, and little direct guidance on “how-to-do” AR (McKay and Marshall, 1999a).

The dual
imperatives of
action research

49

The action research process: one cycle or two?

The usual representation of the AR process is as a single cycle (with possible iterations), no matter which depiction of AR is used. In Figure 1, the quadrants (A: McKay, 2000; B: Susman and Evered, 1978; C: Burns, 1994; D: Checkland, 1991) are various representations of AR, and are all indicative of this point.

What is common to all these models is the notion of a singular cycle as characteristic of the AR process. This cycle can be passed through once in an AR study (referred to by Baskerville and Wood-Harper, 1998 as linear AR), or it can be repeated in the same context until satisfactory outcomes have been achieved, or a similar process can be applied in a number of different sites

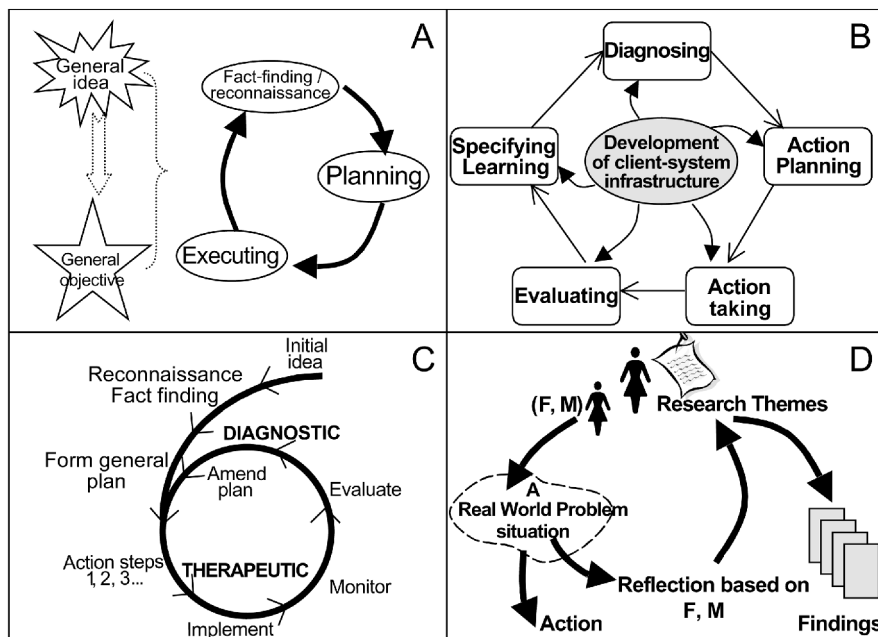


Figure 1.
Representations of the
action research cycle

(called multiple iterations of AR (Kock *et al.*, 1998)). The issue here is not whether or not multiple iterations of the AR cycle have been implemented, but whether AR can rightfully be conceptualised as consisting of a single cycle.

In our discussion of AR in a previous section of this paper, the duality of AR was described as the juxtaposition (and indeed interdependence) of action and research, of theory and practice. This means that the action researcher has dual aims: the researcher must aim to bring about improvements through making changes in a problematic situation, and must also aim to generate new knowledge and new insights as a result of his/her activities. So, conceptually at the very least, there appears to be two AR cycles, one overlaid on the other, and operating in tandem with one another. The first cycle relates to the researcher's problem solving interests and responsibilities, the second to the researcher's research interests and responsibilities. These ideas require further explication.

Figure 2 is a representation of the researcher's problem solving interest. An action researcher must become aware of a real-world problem, one that provides scope for the elucidation of research themes or ideas. Following initial identification, there then follows a reconnaissance and fact-finding activity, where the action researcher endeavours to find out more about the nature of the problem and the problem context, who the problem owners are, key stakeholders in the problem solving process, historical, cultural, and political components of relevance, and so on. Thus armed, the action researcher, maybe in collaboration with participants in the process, plans a problem solving strategy, and then proceeds to implement a number of action steps. These steps may or may not be guided or informed by a particular problem solving approach (such as Soft Systems Methodology (Checkland, 1981) or Multiview (Wood-Harper *et al.*, 1985), or the like). These actions are monitored and

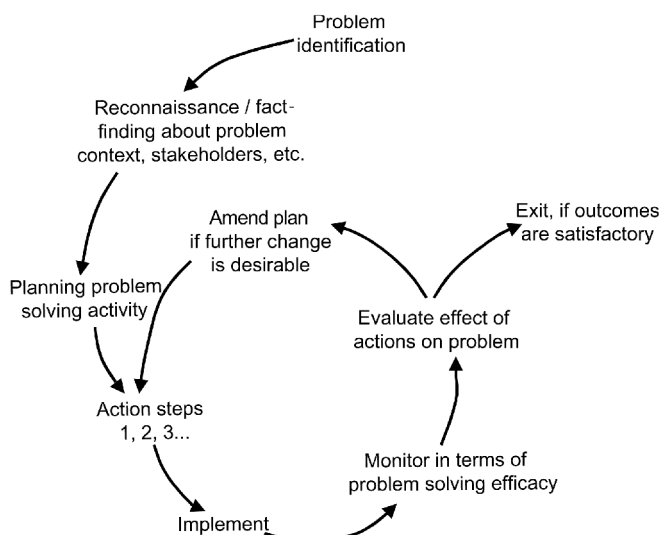


Figure 2.
The problem solving
interest in action
research

evaluated for their impact on the perceived problem situation. At such time as satisfactory outcomes are deemed to have been reached by the stakeholders to this problem context, the researcher exits from the situation, or alternatively, amends the action plan and makes additional changes to the problem context, thus embarking on another AR cycle.

So how does this differ from “good” problem solving that might be undertaken by a skilled operational researcher, business analyst, or systems analyst? What makes it different, we believe, is the second cycle, which we argue is built upon the research interest and responsibilities inherent in AR.

In Figure 3, we have attempted to depict the research interest cycle in AR. In this case, the researcher has a particular idea, or objectives, or research questions of interest which he/she wishes to pursue. Having identified some initial area of interest, the researcher will engage the relevant literature, clarifying issues and identifying existing theoretical frameworks of relevance. A theoretical framework from which to investigate the research interest will be adopted. From there, the researcher plans and designs a research project with the express purpose of enabling him/her to find answers to research questions, themes, or objectives, and so on. Action is taken, the researcher remaining cognisant of his/her particular theoretical perspective. These actions are monitored in terms of research interests, and evaluated for the effect the intervention has had in terms of the research questions. If the research questions can be answered or satisfactorily resolved, or in some way illuminated or even reframed, the researcher exits from the organisational setting. Otherwise, the researcher will amend his/her plans and designs to seek further explanations. Another AR cycle is thus embarked on.

Before proceeding, a couple of caveats must be emphasised. The researcher acknowledges that real-life thinking and acting will rarely follow the neat

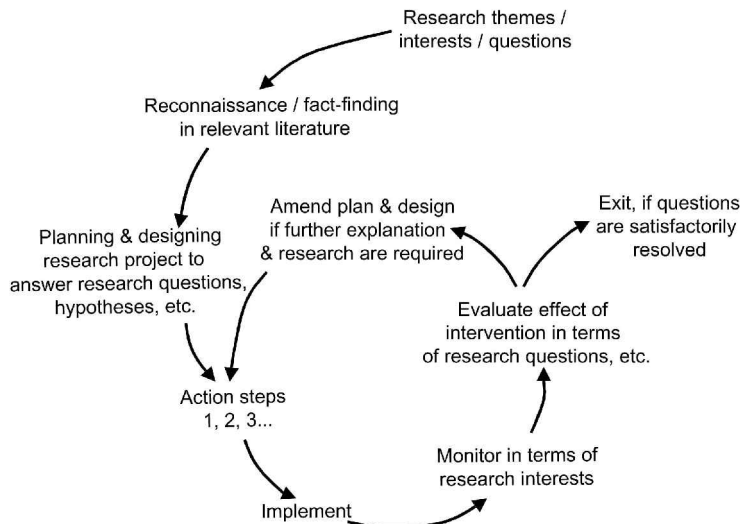


Figure 3.
The research interest in
action research

linear sequence implied by the preceding diagrams and descriptions. Let us accept that real life is a much more messy business than is implied here. This is a problem which besets all models of the real world. Nonetheless, we believe the models and concepts expressed remain valid. Second, it is stressed that these two cycles are not conducted independently of one another, but are highly interlinked and somewhat contingent on one another (see Figure 4).

We would assert that AR is more helpfully viewed and thought about as consisting of these two cycles, which can be superimposed on each other.

What we are asserting and trying to emphasise here is a view that action researchers need to think and act more deeply and more reflectively than any of the AR models captured in Figure 1 would suggest. We think that researchers need to think about their problem solving interest in AR, and also about their research interest. By doing so, we believe much greater clarity will ensue for both researcher and consumers of the research output. This position, has, we believe, a number of important ramifications.

First, adoption of this dual cycle view in both our thinking and practice of AR dispels the criticism that AR is just like consultancy. We would suggest that consultancy is not dissimilar to the problem solving interest in AR (see Figure 2). AR which is deemed to be just like consultancy may be found to be lacking in its attention to the research interest cycle. However, if we explicitly add and clearly acknowledge the research interest of AR, then AR is obviously not the same as consultancy, and the research interest cycle offers a mechanism for action researchers to clearly differentiate their activities from those of consultants. Furthermore, we would assert that thinking about AR as though it were composed of two cycles makes it a lot easier for the action researcher, particularly the less experienced researcher, to ensure that they are doing research, and are not inadvertently trying to masquerade consultancy or problem solving as research.

Second, we think it becomes clear that in reference to Checkland's (1991) model of AR for example (quadrant D in Figure, 1), some serious rethinking needs to be done. In this model, Checkland (1991) argues that the cycle of AR

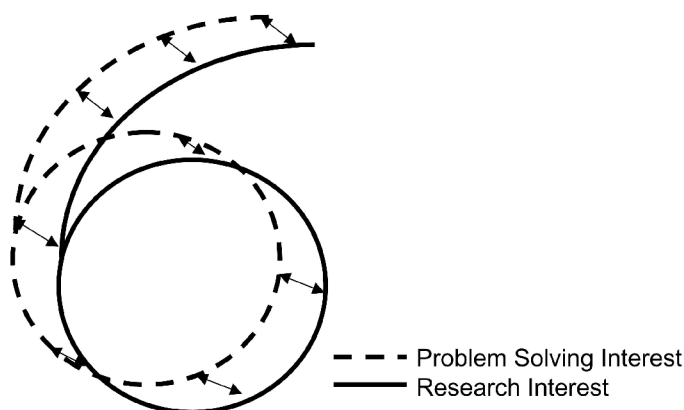


Figure 4.
Action research viewed
as a dual cycle process

entailed the researcher identifying a real-world problem situation (A) potentially of interest to his/her research themes. Prior to any intervention in A, the researcher must declare both a theoretical framework (F) and a method (M) which are used to formulate and guide the intervention, and to make sense of the accumulating experience of the intervention. Subsequently, reflection takes place on these experiences, yielding findings about F, about M, about A, and/or about the research themes. However, the dual cycle process view of AR implies that two methods (M) are potentially being talked about. One M is obviously AR itself, which, as the research approach, is captured in the research interest cycle of AR. Let us call that M_R (research method). The other M potentially appears in the problem solving interest cycle as the method which may be employed to guide the problem solving intervention. Let us call this M_{PS} (problem solving method). We suspect that in some AR interventions, no formal, explicit M_{PS} is adopted (see cases in Greenwood and Levin, 1998, for example). Figure 5 attempts to illustrate this point.

How is this significant? Importantly, we believe it implies that Checkland's (1991) framework involving F, M, and A must be deepened and clarified. Reflection and learning, we would argue, must take place about M_{PS} and M_R : in other words, the researcher needs to explicitly consider what he/she has learned about AR (M_R), from this intervention and what he/she has learned about the approach to problem solving (M_{PS}) adopted on this occasion. Thus we would argue strongly for Checkland's (1991) diagram to be amended as follows in Figure 6.

Conceptually separating M in this way leads to the third important implication of our view of AR. In some AR literature, there seems to be the tendency for confusion to exist over M_R and M_{PS} , particularly when M_{PS} is itself the object of enquiry or the research interest. Such confusion, we would argue, manifests itself in claims that methods or approaches such as soft systems methodology (SSM) (Checkland, 1981), prototyping (Alavi, 1984), Multiview (Wood-Harper *et al.*, 1985), and effective technical and human implementation of computer-based systems (ETHICS) (Mumford, 1985), for example, *are* AR (Baskerville and Wood-Harper, 1998). These

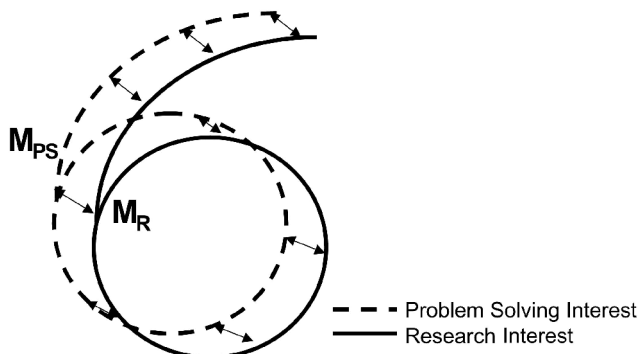
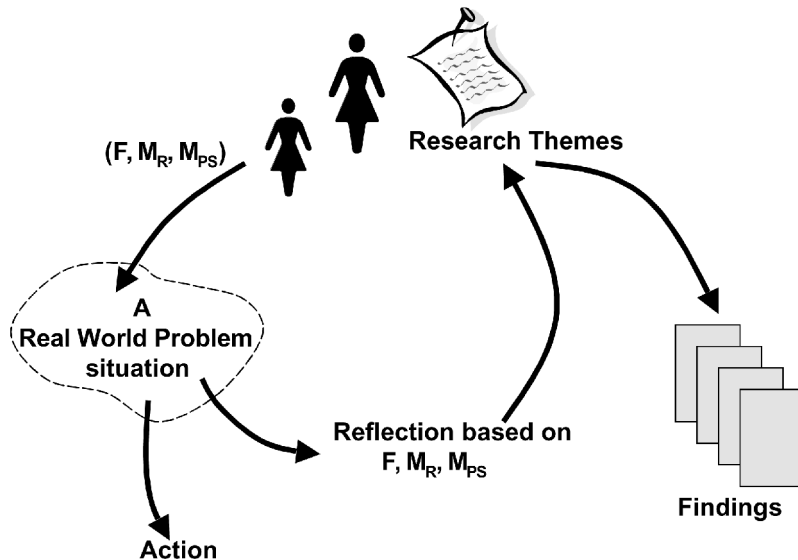


Figure 5.
Thinking about M_R and
 M_{PS}

Figure 6.
The revised action
research framework



methods are all examples of M_{PS} . With the exception of prototyping, these methods have been evolved and developed through extensive AR, and thus, not unexpectedly, may themselves embody many of the features of AR. The problem solving interest cycle of AR would be matched in many a textbook on operational research developed in the 1950s and 1960s (for example, see Ackoff and Sasieni, 1968, Churchman *et al.*, 1957), and thus must be viewed as a rational and responsible approach to tackling certain organisational problems. But being similar in approach to problem solving does not mean that SSM *is* AR. It could mean that SSM (or indeed, any of the other approaches mentioned above) has been used as M_{PS} , and it could be the object of the research, and it could also serve to provide a conceptual framework to guide the research. But SSM itself is not AR (any more than prototyping, Multiview, and ETHICS are). With none of the approaches mentioned here is there the requirement for what we have called the research interest cycle of AR. In our view, until there is a research interest explicit in those methods, then it is confusing and misleading to assert that they are forms of AR.

If the dual cycle of AR is accepted, and the potentiality of there being M_R and M_{PS} , then further elaboration on Checkland's (1991) framework is required, and this brings us to the fourth implication of our view. We would argue that F , M_R , and A are all primarily of concern to the research interest cycle, and that the research must be designed in such a way to enable new knowledge to be generated about F and/or A : in other words, the design of the research must enable the researcher to answer his/her research questions or the like at the very least. Given the nature of AR, it may well be that reflection can (indeed, should) occur on F , M_R , and A , giving rise to new

insights which may or may not have been anticipated in the research questions. But if we think of the problem solving interest cycle, then there is a problem situation (P) in which we are intervening, possibly using M_{PS} . Given the nature of AR, we are thus also in a position to reflect on P, and on M_{PS} , giving rise to what we would call experiential learning, learning from the experience of doing.

A few comments must be made on the relationship between P and A. P may be a specific, real-world example of any particular A, or it may be somewhat different, but allows the researcher to investigate A, so that there would be overlapping elements in P and A. These relationships are illustrated below in Figure 7.

We would argue that this differentiation between P and A is justified, as there is clearly different ownership of these two concepts. The ownership of A rests with the researcher, and this remains the case throughout the research process, no matter what the specific P is. By contrast, P remains in the ownership of participants or relevant stakeholders, and although the researcher is ethically bound to take an interest in P and to act to try to alleviate the problem, it is the participants who retain ownership throughout the research process. This is illustrated in Figure 8.

Let us take an example to illustrate our point. One of the researchers was involved in a research project which was attempting to study the effect of using cognitive mapping (Eden, 1988) for information requirements determination (IRD) (McKay, 1998). Research questions had been developed, based on an extensive review of pertinent literature, to reflect a theoretical premise that the technique of cognitive mapping, and its accompanying method, Strategic Options Development and Analysis (SODA) (Eden, 1989) would be effective to support IRD in an organisation. At much the same time, the authors were approached by a semi-autonomous government agency which was

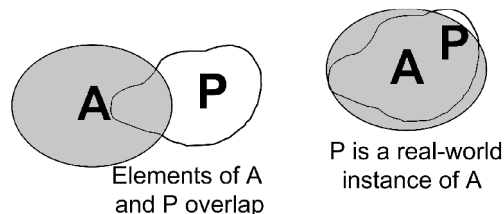


Figure 7.
The relationship
between P and A

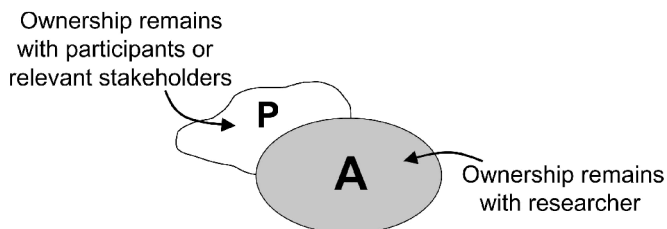


Figure 8.
Ownership with regards
to P and A

experiencing problems with its workers' compensation system (WCS). We were asked if we could assist them in determining their information requirements with respect to the WCS. They understood the research imperatives of university academics, and left to our discretion all decisions about how this was to be accomplished. Given this scenario, we would complete the revised AR framework as shown in Table I.

Our argument says that adequate design of the research interest cycle would enable new knowledge to be generated about A, and most likely F. Reflection on F, A, and M_R, will also generate new insights, modify existing questions, or raise new questions. But through the problem solving interest cycle, through intervening and acting in a real-world context, then we would assert that experiential learning about P and M_{PS} may well have taken place. Whether or not such experiential learning should take the status of new knowledge generated by rigorous research activity is debatable: our own predilection is that it probably should not. But in our view, it still constitutes a meaningful outcome of the research, and it most certainly could, indeed should, form the basis of a subsequent research effort. Quality of AR falls outside the scope of this paper (see McKay and Marshall, 1999b), but let us flag at this stage the notion that the research interest cycle has everything to do with an assessment of rigour and quality of AR, while the insights and experiential learning associated with the problem solving interest cycle have more to do with the richness of AR, the enhancement of skills and competencies of both the researcher and participants, and understanding about the nature of intervention in organisational problem contexts.

Thus, in Figure 9, we rework Checkland's (1991) framework once more to reflect these ideas.

Conclusion

This paper has provided a detailed consideration of the nature of AR and in particular, some of its features which make it an attractive proposition for the conduct of much IS research. However, concerns about the research process adopted with AR, together with concerns regarding the need for a clear conception of the nature of the AR process, were voiced. These include the need for research questions or hypotheses to be clearly formulated up-front, for thought and care to be given to planning and executing the

Table I.
Elements of an action
research intervention

F	=	Cognitive mapping and SODA have characteristics that would render them effective for application to IRD
M _R	=	Action research
M _{PS}	=	SODA and cognitive mapping
A	=	Issues and challenges in effectively determining information requirements in organisations
P	=	Identifying information requirements for a new WCS at the government agency

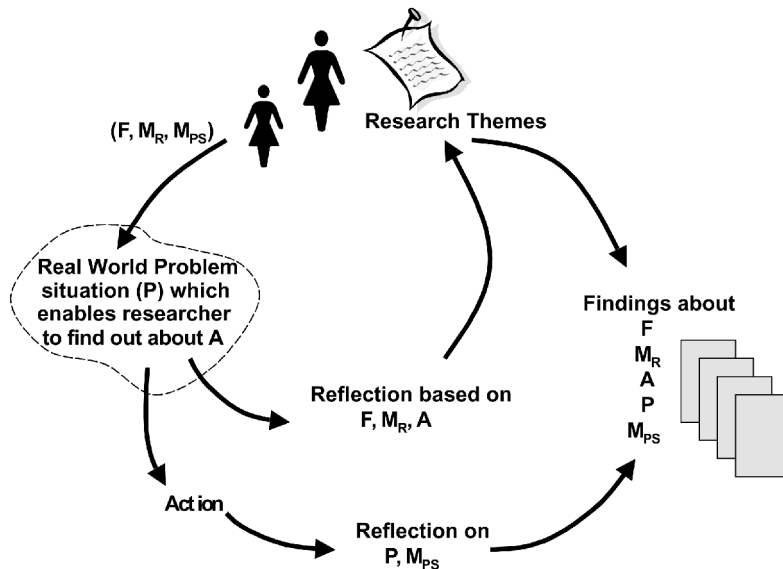


Figure 9.
Outcomes of dual cycle
action research

collection of data, and for equal care and attention to be given to the analysis of such data. The authors also suggest that the data collection and data analysis should be explicitly and carefully described when the research is reported. Giving these matters the attention they need and deserve will, the authors feel, improve the practice of AR in general, and in IS in particular.

Thus this paper has reiterated some of the features of AR that make it particularly apposite for application to many facets of research in information systems. These benefits and strengths of AR were clearly seen to outweigh its limitations, but concerns were voiced about the practice of AR, and about the need to maintain rigour and credibility in the knowledge or theory generated through real-life interventions. Considering AR as being composed of the dual imperatives of problem solving and research enabled the authors to develop a new model of AR. This new conceptualization presents AR as two separate but interconnected and interacting cycles: one cycle representing and focused on the problem solving interest in AR, and the other cycle representing and focused upon the research interest in AR. Not only does this help dispel the criticism of AR that it is just like consultancy, but it arguably facilitates researchers in being much more explicit about the reflection and learning process that seems to be part of the essence of AR. This conceptualization, the authors believe, allows for better planning, evaluation, and monitoring of the AR process and project. The authors also argue that conceptualizing AR in this way may improve the rigour of AR, as it requires researchers to pay more considered attention to their research interests and responsibilities than do many of the more traditional models of AR.

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