Controlling action research projects

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Keywords *Information systems, Action research, Methodology, Control*

Abstract *Action research (AR), which emphasises collaboration between researchers and practitioners, is a qualitative research method that has much potential for the information systems (IS) field. AR studies of IS phenomena are now beginning to be published in the IS research literature. However, the rigour of many AR studies in IS can be improved. When AR has been published, the findings have frequently been emphasised at the expense of the process. In this article, we look at the process in AR projects, and look at some of the key choices and alternatives in controlling AR. We discuss three aspects of control: the procedures for initiating an AR project, those for determining authority within the project, and the degree of formalisation. We analyse seven recent AR projects in IS and from this analysis distil recommendations for determining these control structures.*

Introduction

Action research (AR), which emphasises collaboration between researchers and practitioners, represents a potentially useful qualitative research method for the information systems field (Baskerville and Wood-Harper, 1996; Lau, 1997; Myers, 1997; Avison *et al.*, 1999). AR differs from case study research in that the action researcher is directly involved in planned organisational change. Unlike the case study researcher, who seeks to study organisational phenomena but not to change them, the action researcher is concerned to create organisational change and simultaneously to study the process (Baburoglu and Ravn, 1992). This makes AR especially interesting in the area of information systems development (Avison *et al.*, 1998).

AR is not without its problems. In particular, the "double challenge" of action and research creates many difficulties, which may partly explain why many information systems (IS) researchers have been reluctant to use this qualitative research method in the past (Baskerville and Wood-Harper, 1996; Lau, 1997). The primary purpose of this paper, therefore, is to suggest how the "double challenge" of combining both action and research can be overcome. Specifically, we focus on key alternatives and structures in controlling AR projects. Inability to negotiate these control structures has been directly linked to failure of IS AR projects. In this paper, we show how this body of control structures is critical for meeting the "double challenge".

Information Technology & People,
Vol. 14 No. 1, 2001, pp. 28-45.

The analysis of these control structures not only extends our understanding of the AR method, but contributes to a potential advancement in the rigour and success of AR studies in IS.

Definition

There are numerous definitions of AR. One of the most widely cited is that of Rapoport (1970, p. 499), who defines AR in the following way:

> Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework.

This definition draws attention to the collaborative aspect of AR and to possible ethical dilemmas which arise from its use. It also makes clear, as Clark (1972) emphasises, that AR is concerned to enlarge the stock of knowledge of the social science community. It is this aspect of AR that distinguishes it from applied social science, where the goal is simply to apply social scientific knowledge but not to add to the body of knowledge (Myers, 1997).

The "double challenge" of combining both action and research potentially leads to difficulties of control in an AR project. These difficulties are compounded by the fact that AR is highly situational. Each AR project, to some at extent at least, is unique, and it is difficult to draft general laws about how to carry out such projects. Therefore, rather than attempting to draft general laws that must be applied in every situation, in this paper we suggest general guidelines for controlling AR projects in IS. We suggest that all action researchers should consider these guidelines in all AR projects, although it is clearly up to IS researchers to interpret and apply the guidelines for themselves.

Controlling AR projects: issues of initiation and authority

There is no consensus on the ideal control structures for AR projects. However, there are three key aspects of the AR situation that help to determine what the basic nature of these control structures should be.

(1) The first aspect concerns the initiation of the AR project.

(2) The second concerns the determination of authority for action in the research project.

(3) The third aspect concerns the degree of formalisation of the project.

The initiation of AR projects

Considering the first aspect, how are AR projects initiated? AR focuses on addressing a situation where problems exist. Sometimes the action researcher may "discover" the problems, but in other situations the problems "discover" the action researcher (Root-Bernstein, 1989).

The former case is research-driven initiation, in that the action researcher might be in possession of a general theoretical approach to addressing problem situations and looking for settings that are characterised by such problems. In this situation, the practitioners may be somewhat dubious or indifferent, particularly if they are unaware that they are in fact confronting serious problems. Sometimes, there is a mixture of the two ways of initiation. It evolves from discussions between researchers and practitioners, possibly following on from consultancy work.

The latter case is problem-driven initiation, in that practitioners might be confronted by a seemingly insurmountable problem and seeking help from theoretical specialists. In this situation, the researchers may have to develop their research program somewhat opportunistically, undertaking a series of research projects that have a broad theoretical span. The researchers attempt to learn from these experiences and draw conclusions which then help to further develop the theory.

The goal of the initiation process among both the practitioners and the researchers is the discovery of a mutual interest in solving the problem at hand. Either of the cases above can lead to success or failure depending on whether this initiation goal is achieved. This failure occurs because the researchers find no prospects for knowledge discovery in the problem setting, or the practitioners find no prospects for solving the immediate problem (or both). Kock (1997) has shown exactly how this failure unfolds in researcher-driven initiation, identifying three failure forms:

(1) *Iceberg subjects*. Practitioners do not understand the real opportunities for improvement.

(2) *Irrelevant subjects*. There are no prospects for generating knowledge in the particular problem setting.

(3) *No client*. No problem setting can be found that matches the theoretical frames of the action researcher.

The determination of authority for AR projects

The second aspect of control – the determination of authority for AR projects – is more complex. Once the project has been started the mechanisms by which authority is defined are very important. These mechanisms include the determination of action warrants, power over the structure of the project, and processes for renegotiation and /or cancellation.

Action warrants define the authority under which action may be taken. Rarely will an organisation cede ultimate authority for organisational action to an external researcher. This guarded commitment is reasonable since the researcher's motives are divided between research goals and organisational problem-solving goals (Rapoport, 1970). In some cases, the entire AR team, composed of both researchers from a university or other research team (whom we have termed researchers in this paper) and internal organisational

professionals (whom we have termed practitioners in this paper) is consultative, advising decision-makers on recommended actions and possible outcomes. In other cases, a team consisting of researchers and practitioners may be granted final authority for determining organisational action. The form of such a warrant is rarely created by a direct fiat, but rather by appointing internal team members who already possess such authority for action.

The source of the warrants reveals a great deal about the project setting. A warrant established by the CEO in a large enterprise differs qualitatively from one established by an office manager in a small, remote field office of the same enterprise. The decision-maker issuing these warrants defines the actual scope of the project. Importantly, the organisational power held by that decision-maker also defines the potential scope of the project.

The nature of the action warrants has implications for the project. A team which is consultative rather than led by individual decision-makers has more potential for domination by researchers, since ultimate decisions for action are pushed outside of the group, and the practitioners can more easily defer to the researchers, particularly for high-risk action advice. A team with authority-bearing practitioners has more potential for domination by these powerful practitioners, since they will be personally held responsible for the results of the team-determined action. Issues of risk may loom larger in such cases depending on the degree of risk-adversity that characterises the powerful practitioners. Such a group may be more likely to make changes iteratively, since a series of small organisational experiments will be less risky in most situations than bold, sweeping organisational changes.

The degree of formalisation in AR projects

The third aspect of control in an AR project involves the ability to renegotiate AR structures. Formal or informal mechanisms may permit changes in the research team membership and warrants (perhaps thereby redefining the project scope). This renegotiation is likely to be quite informal, representing an evolution of the project as the outcomes from organisational actions emerge. The evolution may change a consultative team into an authority-bearing team, a linear action process into an iterative action process or vice versa. Indeed, the project may be reinitialised, shifting from a researcher-driven mode to a practitioner-driven mode, as the practitioners discover implications of a previously unnoticed problem.

Most AR projects begin with a fairly concrete conceptualisation of the determination of their conclusion: a goal state in which an immediate organisational problem or set of problems has been alleviated. This pre-conceptualisation is particularly evident in practitioner-initiated projects. This conceptualisation may evolve as a result of changes in the warrants (the scope), but the concluding goal state, whether achieved or not, can often be characterised, at least through later reflection, from the very beginning.

It is sometimes less clear, and an interesting indication of the project setting, how a project may be cancelled. A cancellation midstream by the host organisation might be a disaster for the researcher, for example, if part of a PhD program, particularly if the work is a key element of a larger research program or the researcher has invested considerably in developing the theoretical foundations after the problem was discovered. Similarly, a cancellation midstream by the researchers may leave the host organisation in a worse condition, relevant to the immediate practical problem, than their original position at the outset of the project. Valuable time and effort may have been wasted while a serious practical problem remains unsolved.

Particularly relevant in such cases will be the degree of formalisation, typically defined in written agreements, such as a contract or letter of agreement. If the AR project goes well, there may seem to be no need for such agreements. However, if a project is cancelled, or in danger of being cancelled, then the lack of a formal written agreement might be a cause of problems and disputes (though a formal agreement itself does not preclude the latter). A contract might also specify such aspects of researcher engagement and team composition. Some potential alternatives for the formalisation of AR projects will also be discussed further in the next section.

Seven AR projects: the balance of power and control

We now look at seven AR projects in order to assess their control structures according to the three aspects discussed in the previous section: initiation, authority, and formalisation. These seven examples were invited for discussion at the 1998 North American Information Systems Action Research Workshop in Atlanta, Georgia, USA. These were selected because of the opportunity afforded in the workshop to discuss the control structures of a variety of information systems AR projects with the researchers who conducted the studies. Of course, not all of the examples fell neatly and tidily into each of these categories, control in real-world research is both complex and subtle, but Table I emerged from the

Example	Initiation	Authority	Formalization
Semantic database prototype (Baskerville, 1993)	Client	Client	Formal
Reorganization of the IS of the NCF (Simon, 1998)	Client	Client	Formal
Coping with systems risk (Straub and Welke, 1998)	Researcher	Client	Informal
An AR study of asynchronous groupware support (Kock and McQueen, 1998)	Researcher	Staged	Informal
Building a virtual network (Lau and Hayward, 2000)	Collaborative	Client	Formal
Revealing complexity in ISD (Chiasson, 2001)	Collaborative	Identity	Evolved
IT requirements to augment organizational sensemaking (Nosek, 1998)	Collaborative	Identity	Informal

Table I.
Control aspects of seven IS AR projects

workshop discussions of the seven examples as being a fairly accurate description of what happened in practice.

Initiation

Initiation refers to the genesis of the AR project. Did the problem discover the research or vice versa? There are three forms of initiation found in the seven examples: client initiation, researcher initiation, and collaborative initiation.

Client initiation represents the classic genesis of AR, in which a host organisation with a serious immediate problem seeks help from a knowledgeable researcher. While this form of initiation has been characterised as typical, or even characteristic in AR (Schein, 1987), only two of the seven examples seem to fit this type. Baskerville's (1993) study of semantic database prototypes involved a search by an organisation for an alternative design approach following the failure of two previous projects. Simon's (1998) study on "The reorganization of the information systems of the US Naval Construction Forces" involved an invitation to the researcher by the organisation. In both these settings, the researcher neither selected the research site nor the research question, the researcher's interest was called upon by the problem organisations. Rather than the researcher defining the research setting, the problem discovered the researcher.

Researcher initiation represents an alternative approach for AR, in which the researcher begins by searching for a host organisation as a site for an AR project. This form of AR initiation leads to a project bearing some similarity to a field experiment. While supposedly less common, two of our examples appear to fit this characteristic. The action project underlying Straub and Welke's (1998) study on "Coping with Systems Risk" began as a non-intervention case study with an established theory. The opportunity for intervention arose after the engagement had begun. In Kock and McQueen's (1999) study "An Action Research Study of Asynchronous Groupware Support", the researcher sought two host organisations, whose primary concern was business process redesign, which were willing to experiment with groupware as a means to achieve the redesign.

Collaborative initiation represents a setting in which the AR evolved from the interaction between researchers and client. In Nosek's (1998) study *IT Requirements to Augment Organizational Sensemaking*, executives in a special MBA program led by the researcher chose to participate actively by intervening in their own organisations. Similarly, in Lau and Hayward's (2000) study, "Building a Virtual Network", the research evolved from the interventions of regional health representatives following a seven-week training course that positioned information technology in the restructuring of community health services. In Chiasson and Dexter's (2001) study, , the researcher was developing software and infrastructure in two heart clinics, and used this venue as an opportunity to engage the host organisation in an "offshoot" AR project. In these projects, researchers and host organisation

representatives were originally engaged in one activity, and although not unrelated to the ultimate AR project, both the problem and the research seemed to be interactively discovered by both the client and the host.

Authority

Authority refers to the issue of "who is really in charge of the research project". Elements of this authority include action warrants, processes for renegotiation of the structure of the project, and authority for cancellation discussed in the previous section. While AR reports may not explicitly describe the division of power among the stakeholders, it can sometimes be inferred from the way that the research project evolved. As in the initiation characteristic, there are three notable authority patterns in AR projects. However, these are not parallel with the initiation characteristics. These patterns are:

(1) client domination;

(2) staged domination; and

(3) identity domination.

In a client dominated AR project, the research team itself does not hold an action warrant. Rather the team recommends and justifies action to organisational managers outside of the team. Once approved, the team may thereafter be intervening, that is, executing the approved action and monitoring the outcomes. This form of authority seems to be quite common in AR practice, despite the preoccupation with collaboration espoused in the general social science AR literature (Whyte *et al.*, 1991). Three of the examples are characterised by client domination. In Baskerville's (1993) study, the AR team was composed of analysts and programmers without any warrants for action or authority to renegotiate the project structures established between a government department and a consortium of universities. An inter-agency agreement nested cancellation authority strictly with the client. In Simon's (1998) study, the research team did include three powerful managers (chiefs of staff), however it is explicitly noted that the team's proposals of action must be sanctioned by more senior commanders outside of the team. In Lau and Hayward's (2000) project, the role of the researcher involved suggesting technologies, but the final decisions regarding their use were always left with the organisers, participants, co-ordinators, and support staff.

In Straub and Welke's (1998) study, the power domination profile is much more subtle. The intervention involved inserting concepts and principles of theory-grounded models of security planning into a professional training program and systematically evaluating the outcome. While it is conceivable that this intervention might have been made without notice from upper management in the organisation, the researcher continuously met with these senior managers and conceded authority over the intervention to their approval.

Staged domination involves a migration of power domination among the AR stakeholders. For example, a project that begins rather informally regarding a problem that the practitioner organisation does not feel is serious, might initially be dominated by the researcher. As the collaborative team develops organisational awareness of the gravity of the problem, the field of action may broaden. The power domination may migrate from the researcher into a form of collaborative power-sharing. A further, wider-scope stage may even migrate power from the collaborative form to a final practitioner-dominated form. This stage pattern may be found in AR projects that grow in scope and field of action. An example of staged domination is found in Kock and McQueen's (1998) study, in which the researcher intervened initially to insert the use of a particular group process methodology into the organisational processes. Further interventions became more collaborative, as the members of the original group dispersed back to their parent organisations and the long-range effects of the original intervention rippled through five organisations.

Identity domination means that the researchers and the practising organisation professionals were the same person (or persons). In other words, one or more of the researchers were internal members of the practitioner organisation, and already possessed the action warrant authority necessary to make the interventions. Typically, these persons would also have the authority to renegotiate the scope or cancel the AR project. Two example studies are characterised by identity power domination patterns. In Nosek's (1998) study, executives involved in an executive MBA program became the action investigators. These people were either already participating in making the decisions within the field of action scope, or were able to become involved in these decisions. Four researchers joined together in Chiasson and Dexter's (2001) study to undertake the multi-purpose SoftHeart project. The purposes of this project were varied, with each researcher operating with shared and individual goals that were nevertheless kept explicit.

Formalisation

Formal control structures are typically defined in written agreements, such as a contract or letter of agreement. These agreements may describe the immediate problem situation and the scope of the research. These may also prescribe the mechanisms of researcher entry into the organisation (engagement), the collaborative team composition, the warrants for action, mechanisms for renegotiating the agreement, and termination of the project through either cancellation or disengagement (Susman and Evered, 1978). These agreements may also deal with research sponsorship or compensation for the researcher.

Informal control structures are found when no written agreements exist. In some cases, the project may begin with little consensus or understanding by the parties involved over essential aspects of the research. The exact nature of the problem situation may be indeterminate, the scope of the problem may be unseen, and the remaining AR project details equally unpredictable. In such

settings, the researcher's first task may be to discover the nature and scope of the problem, and thereby determine the control structures. Here, any formal control structures must emerge after the research commences. The question of formal structures may never be raised, and some AR projects may complete having engaged the researchers and practitioner organisations informally throughout.

A "pure" formal or informal set of AR control structures may be rare in practice. Depending on the nature of the researcher, the practitioner organisation, resource provisions, and the problem setting, some projects may commence with more formal structures than others. There may be some transition as the project emerges, and this transition will not always move from informal to formal control structures. A project that begins with more formal control structures is not likely to become less formal as the project develops. However, informal control structures may evolve into other forms of informal control structures as an AR project emerges. Another possible variation occurs where a written contract is agreed and signed on the basis of "do not worry about this it is just a formality", but which might be enforced brutally later if one party is dissatisfied with the outcome.

AR control structures can be classified as formal, informal, and evolved. Formal control structures are well-defined in written agreements at the project outset. Informal control structures will begin and complete with, at most, only broad and general written agreements. Evolved projects require changes in the control structures as the research scope develops progressively, but not necessarily from informal to formal structures.

The nature of the researcher or research organisation is one of the factors that may influence the control structures. If the research is organised through a large or formal research organisation, this organisation may have policies or common practices that involve formal agreements (often standardised) with research hosts. The researcher's status as an authority in the particular problem setting may affect the demands for initial resource provision, which in turn may require the practitioner to initially increase the formality of the research control structures.

Another factor is the nature of the practitioner organisation. Organisational size will affect the formality of allocating resources and policies. Organisations will vary in their policies about involving external expertise, and the organisational element negotiating the AR control structures may have more or less latitude for involving external expertise. The visibility of the problem and the consequent research results to other parts of the organisation (or outside the organisation) may increase the organisation's need for formal research agreements.

The need for resource provision is another factor. The material support for the research must be divided between the practitioner and the researcher organisations or housed entirely in one or the other. AR often requires a substantial involvement of practitioner organisational staff as well as researchers. Support and clerical staff will also become involved. Where the practitioner organisation adopts a philosophy of cost-accounting, the dedication of these resources to the AR project may require formal control

structures. The practitioner organisation may also provide compensation directly to the researcher in the form of consulting fees, or to the researcher's organisation for consulting, research support, or for a secondment package.

The perceived seriousness of the problem may also be a factor affecting the need for more formal control structures. If organisational survival is at stake, the practitioner may seek strong guarantees that the researcher is committed to developing a "solution". Likewise, if the researcher or the research institution is struggling, this pressure could lead the researcher to seek increased formality in the control structures.

There are two further factors related to the seriousness of the problem. One is the scope of the perceived problem. A broad scope reaching across the entire organisation may be considered more difficult than a narrow scope. The problem history is also a factor. An intractable problem that has endured repeated, expensive attempts at a solution may incline the practitioner to seek stronger commitments from the researchers.

These factors may evolve as the AR project develops. A project that was initiated with informal control structures may progressively discover more and more underlying problems with a broader scope demanding increasing resources. The formality of the control structures may evolve in concert with these developments.

Two of the examples involved relatively informal control structures throughout the AR project. Executives involved in an executive MBA class became voluntarily involved in the AR interventions and analysis in Nosek's (1998) study. Although there were some formal control structures involved in the MBA course, these were tangential to the research. The AR was conducted without any need for resources, or even a substantial commitment of the participants beyond that normally required for their professional and academic activities. There were no formal agreements between the practitioner organisations and the researcher. In Kock and McQueen's (1998) project, the AR was implemented in the context of an organisational process redesign training program that would have progressed to its practical outcome with or without the overlaying AR infrastructure. Although there were formal control structures regarding the process redesign training, no such structures were agreed between the practitioner organisations and the researcher.

Three of the examples involved relatively formal structures. Baskerville's (1993) study involved an inter-agency agreement between government agencies and a university consortium. Formal letters established the project infrastructure detailing tasks and resource commitments from the researcher and practitioner organisations. The immediate problem was highly visible, somewhat serious, and "consumed" with history. Similarly, the research control infrastructures underlying Lau and Hayward's (2000) study were established with the sponsorship of a partnership of 18 health authorities. The AR was a component of a pilot project involving resources from three universities and a funding agency. The AR project underlying Simon's study did not involve a

separate research organisation, or a written agreement with the researcher (who was a member of the organisation). The AR control structures were nevertheless established internally in the practitioner organisation with formal control structures (for example, the command staff board). The need for this formal control structure is closely related to the visibility and seriousness of the problem (mission critical system infrastructure).

Changes in the control structures do not always imply an evolution in formalisation. Two of the examples exhibit evolutionary control structures, moving among control structures as the project developed. Only one of these evolved in its formalisation. The SoftHeart software project underlying Chiasson and Dexter's (2001) study began as an informal collaboration between four researchers, but evolved as the scope of the stakeholder community broadened into the clinic. Problems and communication breakdowns with the clinic increased the need for more formal structures. The control structures in the project underlying Straub and Welke's study (1998) also evolved, with the project progressing in an organic way. Some formality is indicated, for example, the use of non-disclosure agreements. But the relationship with the practitioner organisation afforded the latitude for a case study design to emerge into an AR design. While these control structures may have remained more-or-less informal throughout the evolution, structures for controlling an AR project must be quite different from a case study. For example, in a case study the determination of action warrants and authority for cancellation are not typical structures.

Discussion

We have suggested that the rigour of AR projects in information systems can be improved if more attention is given to the issue of control. Table II details the forms and characteristics of the three aspects of control structures discussed above: initiation, authority, and formalisation. Table III details the forms and characteristics of the various authority mechanisms discussed above that were implied by the examples. These mechanisms include the determination of action warrants, power over the structure of the project, processes for renegotiation, and authority for cancellation. Table IV

Control aspect	Forms	Characteristics
Initiation	Researcher	Field experiment
	Practitioner	Classic action research genesis
	Collaborative	Evolves from existing interaction
Authority	Practitioner	Consultative action warrant
	Staged	Migration of power
	Identity	Practitioner and researcher are the same person
Formalisation	Formal	Specific written contract or letter of agreement
	Informal	Broad, perhaps verbal, agreements
	Evolved	Informal or formal projects shift into the opposite form

Table II.
Forms and characteristics of the major AR control structures

Authority mechanisms	Forms	Characteristics
Action warrants determination	Consultative	Practitioner organisation leadership regaining control
	Authority-bearing team members	Practitioner organisation projecting control into research team
	Vested by fiat	Research team assumes responsibility
Power over the structure of the project	Researcher dominated	Consultative, low risk, low profile
	Practitioner dominated	Authority-bearing team membership, high risk
Renegotiation processes	Team membership, problem definition	Changing scope of problems
	Re-initiate project	Discovery of essentially different underlying problem, scope shifts from researcher-dominated to practitioner-dominated
Cancellation authority	Researcher	The practitioner characterises the problem as minor
	Practitioner	Limit practitioner commitment to the research
	Undefined	Most common

Table III. Forms and characteristics of authority in AR projects

Factor	Forms	Characteristics
Nature of the researcher	Formal research organisation	Policies may require formal control structures and researcher domination
	Researcher status as an authority	Limited availability, may require more resources and researcher domination
Nature of the practitioner organisation	Organisation size	Large organisations often have more formal policies
	Policies about involving external expertise	Affects latitude to engage researchers informally and limits researcher domination
	Visibility of the problem	High visibility increases need for formalisation and practitioner domination
Need for resource provisions	Substantial involvement of practitioner organisational staff	Formalisation affected by tight cost accounting philosophy
	Compensation to researcher or research organisation	Formalisation for payment of grants, fees, honorariums, etc.
Perceived seriousness of the problem	Organisational survival	Great practitioner commitment may increase formalisation and practitioner domination
	Scope	Broader scope may increase formalisation and practitioner domination
	Problem history	Intractable, enduring problems may lead to more formalisatoin and practitioner domination

Table IV. AR control structure influence factors

summarises the various influence factors that were important in understanding the determination of formalisation for AR projects.

The description of the AR control structures indicates how these control structures are interactive to a limited degree. For example, we associated factors like a high visibility problem that involves practitioner organisational survival with control structures like formalisation, practitioner initiation, and practitioner domination. This interaction implies that the elements in the control groups (Table II) are deterministically associated with the mechanisms and influence factors. This determination is certainly not absolute, but may be considered implicit. We can detail these implications by mapping the influence factors and mechanisms onto the common forms within the control groups. Table V embodies this mapping.

Recommendations

The AR control structures make it clear that determining the control of an AR project is beyond the independent power of both the practitioner organisation and the researcher. Project control is shared, collaboratively determined, and emergent. The researcher is obliged to stay within the realm of applied theory, those theoretical aspects that are relevant to real problems of today's managers. The practitioner within the organisation is also obliged to stay within the realm of applied theory, taking those actions that can be reasoned from what is broadly known within the field of information technology.

An explicit discussion of control structures is rarely found in AR reports. In some cases these control structures can be detected as implications of the descriptions of the research project setting. Although ambiguity can often be a helpful "social glue" and some blurring of control structures may be positive in an AR project, there needs to be some, perhaps brief, explicit reference to control structures in AR reports to help us interpret and validate the study. There may be some cases, for example, where shifts in the control structure of the AR project need to be reported in order to maintain the validity of the study as findings shift across method variants. Straub and Welke (1998) provide a good example of this as the authors describe how the elements of AR evolved from a case study.

Despite the importance of the control structures for a collaborative activity like an AR project, these structures are sometimes emergent, either highly undefined at the beginning of a project or highly adapted in the later stages of the project. As the examples illustrate, highly defined, formal control structures are not necessary in AR projects. Indeed, they are probably impractical in many AR situations. However, there are some common associations between various influence factors, control mechanisms, and forms of AR control.

Our recommendations do not deal so much with exactly how AR control structures ought to be determined for certain research settings. Rather, we recommend that researchers and their AR practitioner professionals actively and collaboratively determine these control structures in the early stages of the

Mechanisms and influence classes	Factor	Forms	Action research control structures						
				Initiation		Domination		Formalisation	
Collaborative	Practitioner	Staged	Identity	Researcher Formal	Practitioner Informal	Evolved			
Authority mechanisms	Action warrants determination	Consultative	×			×		×	
		Authority-bearing team members		×		×		×	
		Vested by fiat		×		×		×	
	Power over the structure of the project	Researcher dominated	×			×		×	
		Practitioner dominated		×		×			×
	Renegotiation processes	Team membership, problem definition			×				×
		Re-initiate project			×				×
	Cancellation authority	Researcher	×			×		×	
		Practitioner		×		×		×	
		Undefined				×		×	
Factors influencing control structures	Nature of the researcher	Formal research organisation		×				×	
		Researcher status as an authority		×			×	×	
	Nature of the practitioner organisation	Large organisation size						×	
		Policies about involving external expertise							
		Visibility of the problem (low, high)	Low	High		High	Low	High	Low
	Need for resource provisions	Substantial involvement of practitioner organisational staff		×		×		×	
		Compensation to researcher or research organisation		×				×	
	Perceived seriousness of the problem	Organisational survival		×		×		×	
		Scope (narrow, wide)	Narrow	Wide		Wide		Wide	Narrow
		Long problem history		×		×		×	

Table V.
Associations between AR control structures and research setting factors

project. Even if this determination only yields informal structures (for example, an undefined cancellation authority), it is important that these determinations be consciously decided during the course of the research, rather than ignored. The reason that this is important is based on the possible evolution of the control structures. If these structures are not recognised at the outset, their gradual development may go unnoticed by either the practitioner or the researcher. These changes may signify oncoming important scope shifts, critically important information for both practitioner and researcher, but perhaps more critical to practitioners. These changes may also signify shifts of control between practitioner and researcher. Such control shifts may suggest concerted changes in related control structures.

In order to manage the AR project, control is required. Control depends on an understanding of the project control structures. AR is collaborative. Without an explicit understanding of the current and past project control structures, either the researcher or the practitioner (or both) can unknowingly lose control and thereby mismanage the project.

Implications for the theory of action research

Our discussion of controlling action research projects has revealed some potential conflicts with the espoused theory of action research:

- *Mutually acceptable ethical framework.* Rapoport (1970), among others, emphasises a mutually acceptable ethical framework as being a key to AR. This now appears somewhat naïve in situations where either the practitioners or researchers have the upper hand in most control aspects, in particular, initiation and determination of authority. Our study suggests that AR projects are likely to be dominated by either the practitioners or researchers. This may mean that the dominating partner exerts pressure to ensure that their values take precedence. This may be particularly difficult for the researcher, for example, in situations where the practitioners want change to dehumanise the workplace or downsize their company. Willcocks and Mason (1987), for example, show that coercive situations are not uncommon in information systems work. Similarly, it might be difficult for the practitioner where the researcher wishes to test theories in a real situation which do not address the perceived problem nor have obvious benefit to the organisation. Cancellation of the project may not be feasible, even in "intolerable" situations, where there is a watertight formal agreement between the parties. In any case, cancellation might be a major problem for the researchers and practitioners alike.
- *Synergy between researchers and practitioners.* In the nature of the initiation process and the mechanisms for defining authority, the "ideal" of AR, where researchers inform practitioners (and theory informs practice) and practitioners inform researchers (and practice informs theory) in an equal and synergistic way (Avison and Wood-Harper,

1991), might well be compromised by the realities of the particular situation. Indeed, such a statement might also be perceived as being naïve. It is a cornerstone of AR that there is a two-way inter-relationship between theory and practice but, depending on power and control factors, the emphasis, in reality, is likely to be in one direction in most AR projects. This may be particularly difficult in situations where the real control is exercised by "clients" who are outside the project team. A further complication occurs where the practitioner and researcher are, in effect, the same, as in Nosek's (1998) study.

- *The use of formal arrangements.* We have shown that many AR projects are conducted having established written agreements and contracts. Indeed, we have suggested that this has a number of potential advantages. However, this requires clarity and prediction, whereas AR situations are not easy to define and control. AR is not merely a piece of well-defined consultancy. The project is likely to develop in different ways from that originally perceived (the uniqueness of the project makes it interesting to the researcher) and even the boundaries of the project are likely to change as the practitioners and researchers learn from experience as the project develops. Further, a general approach defined by the researcher is likely to change to the requirements of the particular situation. Indeed, that change process leads to improvement in the theory (as well as improvements in practice). Thus there may well be a conflict between what is desirable for control purposes and what is desirable for research purposes.
- *Problem situation rather than problem solution.* Checkland (1981) argues that an action researcher should perceive the aim of projects to improve problem situations, that is, situations where there may be a number of problems, rather than "solve" a particular problem. Although this may be a long-term approach, it may lead to a much improved problem situation. This view is influenced by systems thinkers who might see a particular problem as a symptom of other factors in the situation that need to be addressed. Researchers are asked to apply their craft to the ill-structured, fuzzy world of complex organisations. However, such a view may conflict with that of the practitioners who wish to see the amelioration of an immediate problem in the shortest time possible. Again, depending on the particular power structure that attains, an "ideal" of AR may not be practicable.
- *Difficulties of generalisation and validation.* AR is highly situational – each AR project is unique. This makes it difficult to write with authority on AR. Further, it also makes it difficult for AR to be assessed and, perhaps, impossible for us to suggest general *laws* for the conduct of AR projects. We have only been able to suggest guidelines for controlling AR projects. Such a situation is not always well received by researchers in other disciplines or researchers in information systems using other

research approaches or those who are in a position to fund research and sometimes perceive AR to be *relevant* but not *rigorous*. As the researcher is involved in the change process this implies a loss of impartiality. Further, the approach is often seen as "consultancy" and not "research", and this accusation might be particularly strong where the balance of power is with the practitioners/clients rather than the researchers. Again, the reality of the situation may mitigate against the achievement of some of the goals of AR. However, it could well be argued that general laws cannot be formulated for any projects, and this problem is not unique to AR.

In conclusion, we perceive these difficulties merely as potential or actual problems in carrying out AR. In our view, the potential benefits to practice and research in doing AR greatly outweigh these difficulties. No other research approach has the power to add to the body of knowledge and deal with the practical concerns of people in such a positive manner. We hope that this paper, in drawing attention to the need for good control mechanisms, contributes to making AR more feasible and rigorous for researchers in information systems.

References

Avison, D. and Wood-Harper, A. (1991), "Information systems development research: an exploration of ideas in practice", *The Computer Journal*, Vol. 34 No. 2, pp. 98-112.

Avison, D., Lau, F., Neilsen, P.A. and Myers, M. (1999), "Action research", *Communications of ACM*, Vol. 42 No. 1, pp. 94-7.

Baburoglu, O.N. and Ravn, I. (1992), "Normative action research", *Organization Studies*, Vol. 13 No. 1, pp. 19-34.

Baskerville, R. (1993), "Semantic database prototypes", *Journal of Information Systems*, Vol. 3 No. 2, pp. 119-44.

Baskerville, R. and Wood-Harper, A.T. (1996), "A critical perspective on action research as a method for information systems research", *Journal of Information Technology*, Vol. 11 No. 3, pp. 235-46.

Checkland, P. (1981), *Systems Thinking, Systems Practice*, John Wiley & Sons, Chichester.

Chiasson, M. and Dexter, A.S. (2001), "System development conflict during the use of an information systems prototyping method of action research", *Information Technology & People*, Vol. 14 No. 1, pp. 28-45.

Clark, P. (1972), *Action Research and Organizational Change*, Harper & Row, London.

Kock, N. (1997), "Negotiating mutually satisfying IS action research topics with organizations: an analysis of Rapoport's initiative dilemma", *Journal of Workplace Learning*, Vol. 9 No. 7, pp. 253-62.

Kock, N. and McQueen, R.J. (1998), "An action research study of effects of asynchronous groupware support on productivity and outcome quality of process redesign groups", *Journal of Organizational Computing and Electronic Commerce*, Vol. 8 No. 2, pp. 149-68.

Lau, F. (1997), "A review on the use of action research in information systems studies", in (Lee, A., Liebenau, J. and DeGross, J. (Eds), *Information Systems and Qualitative Research*, Chapman & Hall, London, pp. 31-68.

Lau, F. and Hayward, R. (2000), "Building a virtual network in a community health research training program", *Journal of American Medical Informatics*, Vol. 7 No. 4, pp. 361-77.

Myers, M.D. (1997), "Qualitative research in information systems", *MISQ Discovery*, Vol. 2, http://www.misq.org/misqd961/isworld/index.html

Nosek, J. (1998), "Exploring IT support for organizational learning in the virtual corporation", technical report, David D. Lattanze Center, Baltimore, MD.

Rapoport, R. (1970), "Three dilemmas of action research", *Human Relations*, Vol. 23 No. 6, pp. 499-513.

Root-Bernstein, R.S. (1989), *Discovering: Inventing and Solving Problems at the Frontiers of Scientific Knowledge*, Harvard University Press, Cambridge, MA.

Schein, E. (1987), *The Clinical Perspective in Fieldwork*, Sage Publications, Newbury Park, CA.

Simon, S. J. (1998), "The reorganization of the information systems of the US Naval Construction Forces: an action research project", Florida International University working paper, Miami, FL.

Straub, D.W. and Welke, R.J. (1998), "Coping with systems risk: security planning models for management decision-making", *MIS Quarterly*, Vol. 22 No. 4, pp. 441-69.

Susman, G. and Evered, R. (1978), "An assessment of the scientific merits of action research", *Administrative Science Quarterly*, Vol. 23 No. 4, pp. 582-603.

Whyte, W.F., Greenwood, D.J. and Lazes, P. (1991), "Participatory action research: through practice to science in social research", in Whyte, W.F. (Ed.), *Participatory Action Research*, Sage Publications, Newbury Park, CA, pp. 19-55.

Willcocks, L. and Mason, D. (1987), *Computerising Work*, Paradigm, London.