2000

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Abstract-**This paper discusses nature of action research, and its particular strengths in disciplines such as information systems (IS). However concerns are raised about the quality and rigour of the conduct and reporting of action research studies. Criteria for quality and rigour of qualitative research generally, and for action research in particular, are discussed and analysed. These then form the basis of a framework put forward to guide potential action researchers through issues such as the design, conduct, and presentation of their research, with the aim of improving relevance and rigour in action research studies.**

Keywords: Action research, information systems research methods, qualitative research methods

INTRODUCTION

Information Systems (IS) has long been recognised as an applied discipline. For example, [1] argued that the mission of research in IS was to investigate a broad range of issues associated with the effective use and impact of IS and associated technologies in organisations. Immediately therefore, there is the intertwining of the world of research and the world of practice, and it seems not unreasonable to assert that one of the main objectives of IS research should be to "make a difference", to impact the life of the IT professional and the IT user in efficacious ways. However, when recent estimates suggest that 50% of IT initiatives are considered working failures or are completely abandoned, while only about 10% of such initiatives actually deliver business benefits [2], then it seems reasonable to conclude that IT researchers are not really impacting practice in perhaps the manner that [1] might have anticipated.

However, the view that only through rigorous positivistic research could the IS discipline be advanced has been widely criticised [3]. For example, [3] presents arguments disputing this view, as follows: *"Information Systems will remain a dubious science as long as it tries to emulate the so-called scientific method as the only ideal of academic inquiry. The most visible symptoms of the poverty of scientism are paradigmatic anomalies - crucial research issues which cannot be resolved within the scientific tradition because they transcend its paradigmatic assumptions. The need for affirmative pluralism is offered as a fruitful avenue to improve the status of information systems in academia and practice."*

Thus, there have been calls for rigour and relevance in IS research [4]. However, from certain perspectives, it could be argued that a degree of tension exists between the two: that in the interest of designing and conducting rigorous and elegant research, relevance of content and research outcomes may be sacrificed, or at least made subservient to the demands of rigour [4]. For example, in the human and social domain of IS research, it might be argued that experimental scientific research in the positivist mould may offer rigour, but it is possible that outcomes may be of questionable relevance for the IS community [5,6]. Reference [2] suggests that the dominant positivistic approaches in IS research may produce very reliable results about relatively unimportant issues in practice. Such concerns lead to numerous calls for IS researchers to embrace pluralism in IS research methods [3,7]. In response to these repeated calls, there has been some expansion of research approaches adopted, with interpretive approaches such as ethnography [8,9], grounded theory [10] and action research [11,12,13] all gaining greater acceptance within the IS community. In some respects, however, progress has been frustratingly slow.

For example, IS researchers have for some time now been exhorted to consider action research as a suitable candidate research approach amongst the repertoire of methodologies embraced by the discipline [14]. Action research, after all, boasts many features which would tend to suggest it is ideally suited to study aspects of the planning, development and implementation of information systems within their human, organisational environments. Indeed, [15] argues that action research 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 action research. Reference [16] points out that there is little guidance for the researcher on how to conduct action research. Reference [17] argues that there has been scant attention paid to the reporting of the action research process itself (as opposed to the context and content of the action research study), and question whether there has been sufficient academic scrutiny of the action research process and its underpinning data collection and analysis techniques. If action research 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 action research. This paper aims to rekindle a debate on the practice of action research, and attempts to encourage action researchers to enhance the maturity of their practice by becoming more introspective and reflective about their research. To support this process, a framework to improve the rigour and quality of action research will be proposed and discussed. In the sections which follow, characteristics, strengths and weaknesses of action research will be considered, together with some of the concerns that the authors have about the practice of action research.

CHARACTERISTICS OF ACTION RESEARCH

There is a sense in which the very essence of action research 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, action research is committed to the production of new knowledge through the seeking of solutions or improvements to "real life" practical problem situations [18,19]. However, it is more than just another approach to problem solving, for the action researcher is working from within a conceptual framework [11,20] 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 [6,21].

One distinguishing feature of action research 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 [22], 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 [20,23]. Collaboration between researcher and what may be described as the "problem owner" is essential to the success of the action research 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 [23]. 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 [24]. Thus action research evolves, in part at least, as a function of the needs and competencies of all involved [21], with a key feature of this research approach a willingness to share and thus learn, a result of which are enhanced competencies of all concerned [23].

Underlying the action research 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 [20]. "Facts" in a social context are viewed as being given existence and are interpreted within some socially constructed framework of understanding [6]. Hence, any scientific or systematic investigation of a social context cannot be regarded as value-free [18], nor can it be divorced from the situational and historical context in which it is given meaning [23]. This implies that criteria for assessing the rigour of scientific research may be inappropriate if applied to action research studies.

Within IS therefore, action research offers many features 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 action research *is* the real world, thus avoiding the potential separation of research and practice [21,25,26]. Indeed, it could be argued that in applied disciplines such as IS, action research appropriately establishes action and practice as being the prime focus of research efforts [19]. 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 [6].

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 action research study [18]. In addition, action research is viewed as a means for enhancing the skills and competencies of both the researcher and the participants [23]. 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 [23].

Nonetheless, action research is not without its weaknesses as a research approach, nor is it without its critics. Arguments are expressed, for example, which suggest that action research may be regarded as being little more than consultancy [6], and as such does not constitute rigorous or valid research [11]. When interventions are deemed successful, some would argue that causal connections and explanations cannot be safely made [25,27]. Researchers are questioned over a perceived lack of impartiality and bias [26,28], and given the strong contextual nature of action research, there is typically a contingent nature to the knowledge generated or the theory developed [24, 11]. The supposed lack of scientific rigour and discipline in action research, the lack of validity of data [11], the difficulty of generalising results from action research studies [29], and the difficulty (or impossibility) of replicating the findings of an action research study [30] have lead to it falling into

disfavour in some academic circles, and in action researchers finding it difficult to attract research funds [26].

It seems reasonable to conclude, therefore, that if action research is to gain respectability and increased popularity and acceptance within the IS community, it is imperative for rigorous action research studies to be conducted and published. However, this is problematic for a number of reasons. It was earlier stated that there are few guidelines on how to conduct action research [16], and few papers published that illustrate the process of action research (as opposed to the content of an action research study) [17]. The well-established criteria to assess the merit of scientific research have also been rejected as inappropriate measures to assess the rigour and quality of action research. Thus, IS researchers who at a philosophical and epistemological level accept action research as an appropriate approach are left without a well-defined method or guidelines for action research, few exemplars of action research in IS, and no well established criteria of what constitutes "good" action research. The quality criteria for action research and the framework which follow are steps towards redressing some of these deficiencies.

ESTABLISHING CRITERIA FOR RIGOUR IN ACTION RESEARCH

Perhaps the most well-regarded criteria for rigour in interpretivist research are set by [31]. The four criteria, which mirror the four positivist criteria for rigour, and which are argued to more accurately reflect the assumptions of the interpretivist paradigm are credibility, transferability, dependability, and confirmability [31].

Credibility parallels internal validity, and refers to the way in which the researcher presents the complexities of the context, participants and events of the research setting [30]. Qualitative research, and thus action research, is credible to the extent that there is a reasonable match between the representations constructed by participants and those attributed to the participants by the researcher [31]. Credibility requires that the parameters of the research (in terms of setting, participants, theoretical framework and method) are adequately stated [32], and in terms of action research, implies that action taking is evaluated against its effect in ameliorating the problem situation. Reference [33:30] writes about credibility in the following way: *"A qualitative study is credible when it presents such faithful descriptions or interpretations of a human experience that the people having that experience would immediately recognize it from those descriptions or interpretations as their own. A study is also credible when other people (other researchers or readers) can recognize the experience when confronted with it after having only read about it in a study."*

The second construct is *transferability*, the interpretivist parallel to external validity or generalisability. Action research does not aim to establish universal truths, or to produce outcomes which can be immediately generalised to an entire population. The 'particularist' nature of action research implies a number of things. First of all, the use of an explicit theoretical framework to explain and interpret the outcomes of actions in a problem situation means that others can decide whether the results of an action research study apply to other settings, populations, and interventions: thus, the onus of transferability rests more with the transferor, rather than with the original researcher. However, a rich description of the research setting, process and outcomes will aid subsequent decisions and judgements about transferability [31]. Secondly, confidence in the transferability of findings is likely to increase the more iterations of the action research cycle are undertaken [28]. Thus triangulation [30] using multiple cases, multiple participants and/or multiple data collection techniques are all likely to increase the transferability of the action research findings [32,34].

Dependability is the third construct, and parallels the notion of reliability. The positivist notion of reliability stemming from replication of the study assumes an unchanging world, an assumption quite incongruent with an interpretivist study. Instead, dependability relies on a transparent process, one that is established, trackable and documentable [31], and hence open to scrutiny [30]. Dependability is not threatened if a researcher refines his/her understanding of a setting, or changing conditions require a change in process, as the 'emergent' nature of interpretivist enquiry may imply greater maturity and success. Dependability depends on the auditability of the research process [31], or the ability of another researcher to follow the "decision trail" of the original researcher [33:33].

The final construct for determining rigour in action research *confirmability*, the parallel to objectivity. In a sense, confirmability is the partner of dependability. Whereas dependability relies on transparency of process, confirmability requires that research data can be traced back to their source, and judgements and assertion made about that data are logical and coherent, and are able to be confirmed by an expert other than the researcher [31]. By stressing the need for interpretations and findings to be confirmed by an outside expert, or confirmed in some other way, the concern about possible researcher bias and subjectivity is removed, and findings can be demonstrated to grow out of the data, not from within the researcher [32].

While these four criteria were deliberately designed to parallel the positivist criteria for rigour, [31] were themselves not totally satisfied with them as a measure of rigour in interpretivist studies. Being parallel criteria, they necessarily have their roots in positivist assumptions, particularly in that they are primarily methodological criteria to ensure that the research process has been conducted properly, a hangover from a research paradigm where method has primacy [31]. Appropriate method(s) they argue, do not ensure that participants' meaning are adequately or faithfully represented. Thus, over and above the rigour criteria, quality interpretivist research needs also to meet the authenticity criteria set out by [31] as being:

• *fairness*, the extent to which participants' constructions are represented and presented in a balanced way;

• *ontological authenticity*, the extent to which individual participants grow through the research experience;

• *educative authenticity*, the extent to which shared understanding develops through the intervention;

• *catalytic authenticity*, the extent to which action is stimulated and facilitated by the research process; and

• *tactical authenticity*, the extent to which participants are empowered to act throughout the research process.

Perhaps the most comprehensive approach to obtaining rigour specifically in action research studies is put forward by [27,35], who offer twelve 'contentions' as the standard to aim for in action research. These are reproduced verbatim in Table 1 below.

Reference [27:84] acknowledge that these contentions may create an "*unachievable challenge*" for the action researcher, given all the imprecision and pressures of a real-world setting, but argue that having high standards enables research to be evaluated against them in terms of quality. It would also seem that adherence to their contentions would not only promote action research as a rigorous form of scientific enquiry, but as far as possible, would do much to alleviate the other major criticism of action research i.e. that it is just like consultancy.

Reference [31], with their rigour and authenticity criteria, and [27], with their twelve contentions for quality action research, would seem to offer abundant opportunity for the researcher to design a quality action research study, and then

to proceed with the research in a manner that ensures credibility of outcomes. The aim of the framework which follows is to operationalise a number of these criteria and contentions.

A FRAMEWORK TO ENHANCE QUALITY AND RIGOUR IN ACTION RESEARCH

The framework proposed (attached at the conclusion of this paper) has been constructed around the four categories suggested by [36] as being fundamental to quality considerations of any piece of research, positivistic or interpretivistic. These categories are:

• *Conduct of the research* – This is concerned with issues of quality related to how the research has been conducted, whether it is positivistic or interpretivistic research. Appropriateness of methods and techniques used for the research questions and research context would be included in this category.

• *Conceptual significance of the research* – This category is concerned with topic selection, the use of appropriate theory, coverage of the significant literature, and contributions to knowledge in the discipline. Also considered here would be future research initiatives growing out of the study in question.

• *Practical significance of the research* – This reflects the applied nature of the IS discipline, and is an assessment

TABLE 1
TWELVE CONTENTIONS FOR ACTION RESEARCH

(i)	action research must have some implications beyond those required for action or generation of knowledge in the domain of the project. It be possible to envisage talking about the theories developed in relation to other situations. Thus it must be clear that the results could other contexts, at least in the sense of suggesting areas for
(ii)	as well as being usable in everyday life action research demands an explicit concern with theory. This theory will be informed from characterization or conceptualization of the particular experience in ways which are intended to be meaningful to
(iii)	if the generality drawn out of action research is to be expressed through the design of tools, techniques, models and method then this, not enough – the basis for their design must be explicit and shown to be related to the
(iv)	Action research will generate emergent theory, in which the theory develops from a synthesis of that which emerges from the data and which emerges from the use in practice of the body of theory which informed the intervention and research
(v)	Theory building, as a result of action research, will be incremental, moving from the particular to the general in small
(vi)	What is important for action research is not a (false) dichotomy between prescription and description, but a recognition that description will prescription (even if implicitly so). Thus the presenters of action research should be clear about what they expect the consumer to take and present with a form and style appropriate to this
(vii)	A high degree of method and orderliness is required in reflecting about, and holding on to, the emerging research content of each involvement in the organization.
(viii)	For action research, the process of exploration (rather than collection) of the data, in the detecting of emergent theories, must be replicable, or demonstrable through argument or
(ix)	Adhering to the eight contentions above is a necessary but not sufficient condition for the validity of action
(x)	In order to justify the use of action research rather than other approaches, the reflection and data collection process – and hence the theories – should be focused on the aspects that cannot be captured easily by other approaches. This, in turn, suggests that having knowledge about, and skills to apply, method and analysis procedures for collecting and exploring rich data is
(xi)	In action research, the opportunities for triangulation that do not offer themselves with other methods should be exploited fully and but used as a dialectical device which powerfully facilitates the incremental development of
(xii)	The history and context for the intervention must be taken as critical to the interpretation of the likely range of validity and applicability of results.

(Adapted from [27:84])

of whether the research can be linked to real-life issues and challenges facing IS practitioners. Being able to have some impact on practice is of importance in this category.

- *Presentation of the Research* – The category reflects the professionalism of the reporting of the research, and is concerned with elements of expression and structure, particularly as they affect the intended audience for the research.

The categories actually embrace the criteria discussed in the previous section, but add additional considerations as well. Each of these categories will be considered in turn, with an attempt to justify the inclusion of the various questions. Prior to doing that, a note on the categories is warranted. The categories suggested are not mutually exclusive and debate could be held on which category a particular criteria should be put in. For example, , should a statement about research objectives be categorised in *Conduct of the Research*, or *Presentation of the Research*, or both? It could be categorised in both. Similarly, should notions pertaining to a theoretical framework be categorised in *Conduct of the Research*, or *Conceptual Significance*, or both? Once again, it could be argued that ideally, it belongs in both. However, in the interests of parsimony, it was decided to attempt to categorise each criteria once only, and generally, criteria have been placed first into the category *Conduct of the Research*.

Conduct of the Research

The criteria in this section reflect our concern that action research must be presented and judged to be rigorous research, without being forced to the positivist requirements of rigour. Influential in developing the questions in this section was the work of [27,31]. Given our concerns that above all else there must be transparency of process, with the process revealed adhering to the bulk of the characteristics (tenets) of action research, then this too was included in this section. Justification of the choice of research method as an appropriate vehicle for the conduct of the research also seemed to need representation in this category. We also chose to include a criterion on researcher skill in this category. This seemed to be justified, given the direct involvement of the researcher in action research Researcher skill, it was felt, would impact on the way the research was conducted, and hence at least to some extent on the research outcomes and quality.

Conceptual Significance of the Research

The interest in this category revolved around the use and development of theory throughout the action research intervention. The criteria of the use of an explicit theoretical framework had already been captured in Conduct of the

Research, so it was not repeated here. However, the new dimension included in this category was that the theoretical framework selected could be shown to be linked to the relevant academic literature in the field. In this category we also attempted to capture the development of new knowledge or theory from the action research intervention, and the fact that the action research study should lead on to future research and thus play a part in the development of a corpus of knowledge in a particular field.

Practical Significance of the Research

This category (despite its small number of criteria) is regarded as being of great importance to both action research and the IS community. The problem solving interest of action research requires that the researcher (with the participants) attempts to ameliorate a real-world problem, and thus, being of some practical significance seems to be a fundamental requirement of action research. IS researchers have also been exhorted to acknowledge the applied nature of their discipline, and to engage in relevant research, research that makes a difference to practice [1]. So the criteria in this category were aimed to ensure that the action research intervention would potentially help practitioners and alleviate problems experienced in the IS discipline. We use the word 'potentially' deliberately, because the issue of whether practitioners choose to take up the ideas of the research seemed to us to lie outside the responsibilities of the action researcher, provided of course, that the researcher has made a reasonable attempt to disseminate the results of his/her research to appropriate audiences.

Presentation of the Research

In some senses, potential criteria for this category have been subsumed into the proceedings categories in the framework. However, as it was previously argued that one of the features that distinguished action research from consultancy was the requirement for the action researcher to publish and disseminate their research findings, this category was retained. It was retained to emphasise the need to identify various potential consumers of the research (IS practitioners, IS academics, etc.) and to make an effort to present the research findings to these consumer groups in an appropriate way. It is acknowledged, however, that on some occasions, the full extent of the action researcher's effort to publish and talk about his/her results may be unknown.

USES OF THE FRAMEWORK

In our view, the framework has a number of potential uses. Firstly, we believe it will be invaluable to the researcher, particularly a new researcher, in helping to shape his/her research design and the subsequent conduct of the action research study. Increasing awareness of the sorts of issues and criteria to be cognisant of in conducting a reputable

action research intervention would, we believe, be of great benefit to producing credible research outcomes. We say this particularly in the light of our experiences as PhD student and PhD supervisor. We would have welcomed some clear guidelines to follow to ensure that rigorous research was being conducted. The added benefit here might be that more doctoral students may pursue an action research study, given appropriate guidance, despite being regarded in some circles as *"too risky"* for PhD students [37].

Secondly, examiners of Masters and Doctoral theses may find this framework helpful in considering the quality of the submitted work. The obvious implication is that the framework could be used explicitly in the thesis by the student to demonstrate beyond doubt the quality of their work.

Thirdly, the framework could obviously be of assistance to reviewers of academic papers, who likewise have the difficult task of assessing the value of a particular piece of work. Although it is acknowledged that in the confines of 10-20 pages, for example, it may be impossible to attend to all these criteria, attendance to some of them may help to improve the quality of action research reporting. Conversely, in writing up action research studies, some guidance to structuring a paper may be gleaned from the framework. The framework may play an important role in this regard to help overcome the reluctance of some quality IS journals to publish action research (see [16]).

The framework is *not* offered as a way of 'scoring' an action research study. It is not the intention that marks be added up and a rating of quality given, or such like. However, it seems clear that the greater the number of assessments to the right-hand end of the Likert scales, the more we would be to consider that quality action research had been done. Likewise, a few 'not at all' evaluations on the left-hand end of the Likert scales may not necessarily imply that inferior quality action research had been conducted. It may be that the criteria was simply inappropriate in the particular circumstances of the research. However, in this case, we believe the work would actually be strengthened if some arguments were presented explaining the omission or inappropriateness of the criteria. The framework is offered primarily for guidance and to inform and challenge, not to dictate, prescribe or penalise.

CONCLUSION

Action research would seem to be an ideal vehicle for the conduct of research in IS. But to produce credible results from an action research study, care needs be taken to ensure that quality, rigorous research has been conducted and reported appropriately. Indeed, to avoid the reservations and criticisms about action research, it is incumbent upon researchers to ensure the rigour of their study, and to clearly demonstrate that their work differs from that of the consultant. The framework proposed in this paper claims to do just that: it aims to offer guidance to the researcher, and to

pose challenging questions which, it is hoped, will stimulate reflective and reasoned action on the part of the researcher. In this way, it is hoped that the framework will play a small part in gaining greater acceptance of the legitimacy of action research studies in the discipline of IS.

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CONDUCT OF RESEARCH

Research Method

	Limited — Outstanding
Is adequate and appropriate justification made for the use of action research as opposed to other research methods suitable for IS?	☐☐☐☐

Transparency of Process

	Limited — Outstanding
Are research aims / objectives clearly stated?	☐☐☐☐
Are the history and context of the research described and explained in sufficient detail for consumers of the research?	☐☐☐☐

Are issues relating to the Researcher (R) - Practitioner (P) relationship made clear?
  - roles, responsibilities, expectations of P, R
  - background of R
  - scope of enquiry
  - clear understanding by P of R's interest and intentions
  - degree of involvement by P
	☐☐☐☐

Are approaches and techniques (and the rationale for their selection) for data collection and analysis stated clearly?	☐☐☐☐

Credibility of the Research

	Limited — Outstanding
Is there evidence of an explicit theoretical framework, derived from a review of the relevant literature, guiding the action research intervention?	☐☐☐☐
Have attempts been made to evaluate and explain the success or failure of actions taken to ameliorate the perceived problem in terms of the theoretical framework?	☐☐☐☐
Does it appear that there is a match between the constructions of Ps and those reported by R?	☐☐☐☐
Is there evidence of verification by P?	☐☐☐☐
Would it appear that R has presented a fair and faithful description of events?	☐☐☐☐
Is there an explicit concern with the generation of theory which emerges from the theoretical framework tempered by the experiences of the intervention?	☐☐☐☐

Transferability of the Research

	Limited — Outstanding
Are descriptions of setting, process and outcomes sufficiently rich to aid the judgements and decisions of other researchers regarding the transferability of the research to other contexts?	☐☐☐☐
Could it reasonably be concluded that the research findings and outcomes could inform other organisational settings?	☐☐☐☐
Are opportunities for various forms of triangulation exploited, thus providing greater confidence in the transferability of the outcomes?	☐☐☐☐

Dependability of the Research

	Limited — Outstanding
Is the research process auditable?	☐☐☐☐
Is the research process open to scrutiny?	☐☐☐☐
Are the bases for decision making and assertions / claims explicit?	☐☐☐☐

Confirmability of the Research

	Limited — Outstanding
Is there evidence of an orderly process of data collection and analysis?	☐☐☐☐
Are assertions / conclusions made about data logical and coherent?	☐☐☐☐
Are findings and conclusions grounded in the data?	☐☐☐☐
Are data analysis and research findings confirmable (or have they been confirmed) by an outside expert?	☐☐☐☐

Impact on Participants

	Limited — Outstanding
Does a shared understanding amongst participants or other organisational benefits eventuate as a result of the action research intervention?	☐☐☐☐

Research Skill

	Limited — Outstanding
Is there evidence of adequate skill to mange the action research intervention on the part of R, especially in terms of his/her ability to collect and explore data?	☐☐☐☐

CONCEPTUAL SIGNIFICANCE

	Limited — Outstanding
Has the significance of the research topic to the IS profession been articulated and justified?	☐☐☐☐
Has significant literature in the area of interest been accessed, supporting the selection of an appropriate theoretical framework to guide the research?	☐☐☐☐
Is it obvious that new knowledge / theory has been developed or emerged as a result of the action research intervention?	☐☐☐☐
Does this action research study lead to questions or issues for future research?	☐☐☐☐

PRACTICAL SIGNIFICANCE

	Limited — Outstanding
Would Ps agree that some improvement in the problem situation had occurred as a result of the intervention?	☐☐☐☐
Could this research potentially make a helpful contribution to the work of practitioners in the field of IS?	☐☐☐☐
Does the research help alleviate problems that are evident in the IS discipline?	☐☐☐☐

PRESENTATION OF RESEARCH

	Limited — Outstanding
Is the action research presented in such a way that there is evidence of logical rigour throughout the study? Are the links evident between a problem in the IS field, the literature review, theoretical framework, research method and design, and results / outcomes?	☐☐☐☐
Has the consumer of the research been identified? Is the action research presented in an appropriate form and style to suit the consumer's objectives?	☐☐☐☐
Has publication of the action research (within confidentiality constraints) in an appropriate avenue been sought? Have adequate attempts been made to communicate findings and outcomes to practitioners and other Rs?	☐☐☐☐
Is the manuscript (thesis, research paper, report, etc.) of a professional style and standard?	☐☐☐☐