THE PARTICIPATORY PARADIGM FOR APPLIED INFORMATION SYSTEMS RESEARCH

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ABSTRACT

Information systems research continues to be criticised for the fundamental gap between theory and practice. Critics argue that this is largely the result of the methodological inadequacy of the dominant positivist paradigm to the ontological nature of the subject. Studies which recognise the applied nature of the information systems discipline and thus are committed to the production of practically relevant knowledge have adopted action and intervention forms of research. Despite their strength in producing practically relevant knowledge, such studies are scarce because they are rejected for their lack of scientific credence. This paper introduces the participatory worldview as a research paradigm that provides the philosophical legitmisation for action research approaches. The authors present their experiences with participatory information systems inquiry and illustrate the application of participatory research principles in practice.

1.   RESEARCH IN APPLIED DISCIPLINES: THE SEARCH FOR PRACTICAL RELEVANCE

Recent writings in the philosophy and methodology of social research indicate new developments in the ways in which knowledge is produced (Skolimowski, 1994; Heron and Reason, 1997; Pettigrew, 1997). Those developments occur around orthodox paradigms of knowledge production and have important implications for the validation of action and intervention-focused methods of inquiry. At the centre of the search for new philosophical systems for knowledge production lies the commitment to the practical relevance of social inquiry.

The information systems disciplines increasingly shares this concern. Information systems scholars have been criticising the lack of relevance of research to information systems practice (Keen, 1991; Hirschheim, 1992; Benbasat and Zmud, 1999) and have described information systems as a discipline in crisis (Ciborra, 1998). They argue that our scholarly models provide an unsatisfactory representation of the complexities of information systems in organisations. An example of the limitations of the theoretical representation of information systems practice is the continuing experience of investment failures in organisations (cf. Sauer, 1993; Willcocks, 1994; Ciborra, 1998).

The paper begins by tracing the roots of the relevance problem to the overwhelming influence of positivism in information systems research. The participatory paradigm is then introduced as an alternative worldview

and its strength as a philosophical foundation for action research approaches is demonstrated. To articulate the distinctness of the participatory paradigm, a particpatory information systems research project is recounted and the application of participatory principles is demonstrated.

2.   THE ROOTS OF THE CRISIS IN INFORMATION SYSTEMS

In search of an explanation for the crisis in the information systems discipline, critics have argued that it is basically the result of the positivist hegemony in the study of a subject matter for which it is largely inadequate (Orlikowski and Baroudi, 1991; Hirschheim, 1992; Ciborra, 1998). Some scholars have even asserted that positivism has always been inappropriate to the ontological nature of information systems in organisations (Checkland, 1981; Galliers, 1992; Hirschheim, 1992; Walsham, 1995). In order to advance information systems knowledge, several scholars have argued for the need to take a fresh look at the field and establish the epistemological stance appropriate to the applied nature of the discipline (Hirschheim, 1992; Ciborra, 1998; Goles and Hirschheim, 2000). As inadequate methodologies reflect a misconception far more fundamental than that at the level of method and process, namely, a misconception of the dominant paradigmatic view of the discipline, the debate must be initiated at the philosophical level (Ciborra, 1998).

3.   ACTION RESEARCH: THE METHODOLOGICAL ALTERNATIVE TO RESOLVE THE CRISIS?

Information systems researchers concerned with the lack of relevance of research outcomes have recognised that, in integrating theory and practice, action research has the particular strength of producing knowledge that is directly relevant to the issues being studied (Antill, 1985; Checkland, 1991; Wood-Harper, 1992; Baskerville and Wood-Harper, 1996). However, action research approaches are being attacked for the lack of scientific rigour and objectivity that results in the rejection of research findings on fundamental, philosophical grounds (Baskerville and Wood-Harper, 1996). This brings us to an important aspect of the debate, namely the widely established practice of assessing action research by a positivist theory of validation, a practice which ignores the logic of research assessment (Susman and Evered, 1978; Hirschheim, 1992; Eden and Huxham, 1996). Kuhn (1962) has made this point clear: the rigour of scientific work has to be determined within the confines and canons of the paradigm within which the employed research method is situated, an argument that has also been put forward by action researchers (Baskerville and Wood-Harper, 1996). We subscribe to the view that the recognition of research approaches as good science depends exclusively on the tenets of the research paradigm within which the work is grounded (Kuhn, 1962; Gummesson, 1988; Deetz, 1996). A research paradigm provides a coherent philosophical and methodological system for the conduct of scientific research including a commensurate theory of validation (Kuhn, 1962). As a result of its lack of paradigmatic grounding, action research 'draws on a hazy theoretical base' (Silverman, 1998), having been labelled an 'orphan' in research methodology (Clark, 1972). It is indeed the weakness of its philosophical foundations (King, 1996) that has forced action research approaches to the 'periphery of legitimate scientific methodologies today' (Baskerville and Wood-Harper, 1996).

What then is the paradigm that accommodates action research approaches? Although scholars in disciplines outside information systems have long articulated a paradigm that naturally accommodates action research approaches, information systems researchers seem to have taken little notice, neither of its emergence nor of its significance to our discipline. This paradigm has been termed the *participatory worldview*. It provides the philosophical foundations for research methodologies designed for action and intervention. The next section introduces the participatory worldview as a research paradigm that has the potential to address the crisis in information systems.

4. THE PARTICIPATORY PARADIGM AS A PHILOSOPHICAL FOUNDATION FOR ACTION RESEARCH METHODS

In the social sciences, the participatory research paradigm has been articulated as an epistemological and ontological principle for participatory forms of inquiry (Reason and Rowan, 1981; Heron and Reason, 1997). In *The Participatory Mind*, Skolimowski (1994) was the first to propose a theory of knowledge and of the universe which set the philosophical cornerstone for the participatory paradigm. His historical account demonstrates that the emergence of science, philosophy and a mercantile class in the age of Renaissance gave birth to Mechanos, a worldview deeply imbedded in the belief of a positive science as the tool for understanding a mechanical universe driven by nomothetic law and cause-effect relationships. Social scientists hold that Mechanos continues to be the dominant paradigm for modern civilisation (Reason, 1998). In our discipline, the domination of the positivist logic manifests itself in the struggle of information systems researchers for accreditation of non-orthodox work (Benbasat and Zmud, 1999). They find themselves accused of lack of scientism and experience the predilection of research degree councils, academic journals and funding bodies for positivist research, all of which are testimonies of the continuing hegemony of the mechanistic worldview (Fitzgerald *et al.*, 1985; Baskerville and Wood-Harper, 1996; Joerges and Czarniawska, 1998).

Critics argue that the social, economic and political crises we face in our contemporary world are the consequences of a science driven by positivism (Alvesson and Willmott, 1992; Skolimowski, 1994; Deetz, 1996; Reason, 1998). In contrast to the unrestricted and, at times, destructive effects of scientific progress engendered by the positivist mind, the participatory worldview gives primary attention to the promotion of human welfare through the conduct of socially responsible research (Maxwell, 1984). The crises created by positivism, the participatory worldview argues, are the consequence of the positivist separation of the scientists from the world. The participatory worldview, in contrast, takes the ontological nature of the outer world as objectively given and as subjectively represented in the human mind. It views the earth as a 'living whole', a 'complex system of interrelated entities of which we are part' (Reason, 1998). In participatory research, scientists are an integral part of the world they study, co-creating with the research subjects *their* world and sharing the responsibility for the application of the research outcomes (Reason, 1998).

5. THE PARTICIPATORY RESEARCH PRACTICE

The philosophical principles of the participatory paradigm have been expressed as a set of imperatives for research practice (Reason, 1994). The *methodological* imperative requires the researcher to engage in research *with* people rather than in doing research *on* people (Heron, 1981). The *political* imperative of participatory inquiry acknowledges that knowledge is power and that the capacity to create knowledge is power (Heron and Reason, 1997). The positivist dichotomy between the researcher as the one who *knows* and the research subjects as the ones who do *not know* is removed, returning the capacity of knowledge-creation back to the people. The *epistemological* imperative provides a theory of validation for assessing the legitimacy of knowledge claims. Participation is also guided by an *ecological* imperative which is exemplified by the damage to the earth's ecosystem that science and technological progress have caused and by the sustainability crises we confront at the ecological, political, social and personal levels (Reason, 1998). Participation also has an *aesthetic* imperative that reminds us to realise the beauty of the world, its aesthetics and our participation in it. The *spiritual* imperative of participation compels us to reflect how we use science and how science might best serve humanity (Reason, 1993). The purpose of social inquiry is therefore no longer the search for truth but to bridge the dichotomies that characterise the Western worldview (e.g. male vs. female; knower vs. not-knower). Finally, there are a number of *practical* imperatives for the actual conduct of participatory inquiry that determine a radically different awareness of the researcher's role in and impact on the research process and outcomes. The researcher changes the system and the people that are researched. Participation thus admits to the obtrusiveness of research into the world of the research subjects, a view that is fiercely rejected in orthodox traditions.

The process of participatory inquiry is cyclical. The researcher and the research subjects form 'communities of inquiry' and engage as equal partners in the inquiry process. In the model of participatory research, knowledge is produced through a cycle of interaction, reflection and application. In progressing through the research cycle, as illustrated in Figure 1, four types of knowledge are created: experiential knowledge, practical knowledge, presentational knowledge, and propositional knowledge (Heron, 1981). These four types of knowledge constitute an 'extended epistemology', extended because it reaches beyond the realm of theory into experience and practice (Heron, 1981). Experiential knowledge is gained in the direct contact with the world, be it people, events, places or things. It is mostly tacit and difficult to surface. Presentational knowledge emerges from the filtering of experience and its representation in concepts, metaphors and stories. Propositional knowledge is expressed in our theories about the world. It represents the type of knowledge we form in the conclusions from our research. It is "rooted in and derived from the experiential and practical knowledge of the subjects in the inquiry" (Reason, 1994, p326). Practical knowledge is 'how-to-do' knowledge and is expressed in skills and competencies.
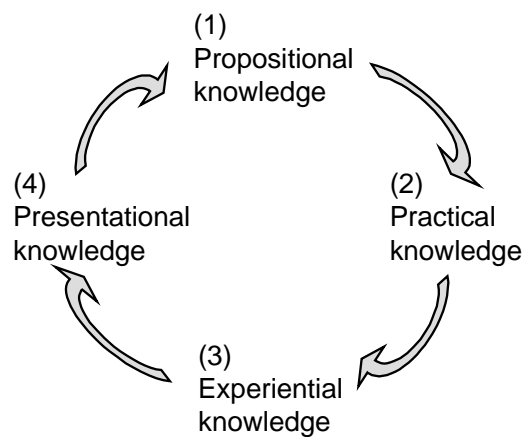
Figure 1. *Research cycling and knowledge creation.*

Source: Based on Heron (1981).

Participatory research proceeds through the four phases of the inquiry repeatedly, cycling between action and reflection, exploring experiences from diverse perspectives, developing diverse ideas and interpretations, and testing different forms of action. The participants, in actively creating, modifying and testing the various forms of knowledge in an iterative research process, not only own but validate the outcomes of the research. Indeed, the cyclical research model provides the strongest validity check of knowledge claims in participatory research. Validity is further enhanced in creating and enacting the findings through those participating in the inquiry. The quality of participatory research is further improved through the commitment to critical subjectivity, which means that the research participants have a commitment to critically examining their beliefs, assumptions and theories in the inquiry process.

6. PARTICIPATORY INFORMATION SYSTEMS INQUIRY IN ACTION: A RESEARCH ACCOUNT

In this section, we first describe a study based on the participatory paradigm and then illustrate how this study applied the principles of participatory research. The conception of the social world in the participatory paradigm is particularly compliant with the nature of information systems in organisations: it reflects the nature of information systems both as an applied science and a socio-technical phenomenon; it resolves the requirement for the continuous innovation of knowledge that results from the frantic pace of technological change; it contributes to the advancement of information systems theory; it performs the requirement for the currency of research output in merging the places of knowledge creation and dissemination; and it creates knowledge that is directly relevant to practice.

6.1. Empirical Example of a Participatory Information Systems Inquiry

The research we recount investigated the management of business benefits of information systems projects in major international organisations. The initial idea for the project emerged at a meeting of member organisations of the Information Systems Research Centre (ISRC) at our institution. The members of the ISRC represent a diversity of roles such as IT directors, change managers, divisional heads, and operations directors. The meetings with the member organisations are held to sustain the exchange of experiences and ideas between information systems academics and practitioners and to evolve the research agenda.

The practitioners expressed a concern about the inadequacy of existing methodologies to successfully deliver the business benefits of information systems investments. Although some members had been using methodologies like socio-technical design principles and soft systems approaches to explicitly address the human and organisational dimensions of information systems implementations, the overwhelming experience was that a business contribution was frequently not delivered as a result of the implementation of the technology. The practitioners further stressed the difficulty of obtaining involvement from senior business management and users in project design and delivery and in addressing the political dynamics of the implementation context. The discussion resulted in the conclusion that an empirically grounded framework for managing and delivering business benefits of information systems projects would be a highly valuable research objective. A preliminary project scope was agreed with an understanding that this was subject to change as the project progressed.

Project cycle 1: Creating the benefits management methodology

Six organisations participated in the first cycle of the research that extended over the period of one year. The organisations represented the pharmaceuticals, utilities, energy, and financial services industries. For a summary of the project types studied see Table 1. The research team for each organisation was formed with six to eight practitioners and three researchers.

The research was initiated by selecting and sharing the literature by all participants, co-researchers and co-subjects. Drawing on existing understanding in the areas of organisational change management, total quality management, investment appraisal, IT implementation, IT evaluation, and productivity improvement, a theoretical framework was devised to guide the analysis. In the specific area of interest, namely the process of benefits delivery from information systems investments, the literature search had confirmed a void of understanding.

The empirical analysis commenced with post-implementation reviews of recently completed information systems projects in the participating organisations. In each of the cases, the researchers and practitioners analysed the extent to which the benefits envisaged in the business cases were actually realised from the technology implementation, including an explanation for their achievement or otherwise. The intra-organisational analysis of the cases was undertaken in bringing together other individuals involved in the projects, such as IT managers, technology users, and business managers, to analyse the data and develop shared interpretations of the findings. On completion of the individual studies, a cross-organisational analysis was undertaken in a plenary workshop that brought all participants together to share the experiences gained in the inquiry process and the findings from the research across organisational contexts.

From the research, an empirical process model of benefits management in information systems investments was developed. This model maps the process in five stages, comprising the elements of benefits identification and structuring, benefits realisation planning, execution of the benefits plan, review and evaluation of outcomes, and identification of future benefits potential. It reflects benefits management as an iterative, cyclical process that spans the entire information systems project lifecycle from the pre-investment appraisal through to the post-investment evaluation. Stakeholder analysis, impact analysis, business driver analysis and benefits structuring were some of the tools that were developed from the data to complement the process model. Further, a framework, termed the 'benefits dependency network', was elicited from the data. This tools connects the investment objectives with the business benefits, along with the required business changes and the IS/IT functionality. Concepts like 'business changes', 'enabling changes', 'benefit drivers', and 'benefits realisation planning' were developed and defined incrementally as the inquiry progressed, thus

building a structured terminology of benefits management and providing a shared language for the community to discuss and exchange experiences and practice. During the inquiry process, a definition of benefits management emerged as the process of organising and managing such that the potential benefits arising from the use of information technology are actually realised.

	Industry	**Project type**	**Business imperative**
Company 1	Pharmaceuticals	Infrastructure	• Cost reduction • Improved time-to-market • On-time product launch • Shift from functional to process based organisation
Company 2	Utilities	Market information and intelligence system	• Part of internationalisation strategy • Inter-departmental information sharing • Head Office co-ordination of client information
Company 3	Financial services	System for tracking new business generated by Independent Financial Advisers (IFAs)	• Sell more business through IFAs • Improve IFAs' perception of service the organisation provides
Company 4	Financial services	System for underwriting and claims processing	• Not defined in business terms • Driven by IT objectives
Company 5	Financial services	System for commercial car fleet insurance quotations	• Improved accuracy of quotations • Improved conversion rates of quotes into business
Company 6	Utilities	Migration of plant maintenance system from mainframe to distributed UNIX environment	• IT cost reduction • Reduced technological risk of mainframe • Support process re-design initiative

Table 1: *Cases and projects studied*

Project cycle 2: Piloting the benefits management methodology

A second cycle of the project was subsequently initiated and this lasted a further year. During this period, the participating organisations implemented on a current information systems project the benefits management methodology developed in the first cycle of the research. The practitioners were then equipped with a review template that contained a set of questions to assist the systematic assessment of the methodology's capability for improving benefits management practice. In this cycle, the role of the researchers was to help in the operationalisation and implementation of the models and tools in the particular organisational context. Quarterly workshops were used to share experiences across organisational contexts and to assess the evolving value of the methodology and to determine those aspects that proved impractical and required further refinement. The overall result of this cycle had proven the core of the methodology as both relevant to the problems encountered in the practice context and feasible to utilise successfully. Fundamentally, whilst cycle one of the project involved the induction of models and methods from the data, their testing and further refinement was undertaken in cycle two of the inquiry process.

Project cycle 3: Disseminating the benefits management methodology

Cycle three of the project examined the wider empirical validity of the methodology by disseminating it to a wider population. In workshops and consulting assignments, the methodology was exposed to a diversity of practice contexts. In taking it through further research cycles in individual organisations, the methodology was consequently further adjusted, expanded and refined. Today, pharmaceutical companies like Glaxo-Wellcome and AstraZeneca, financial institutions like Alliance & Leicester, GRE, Norwich Union and National Westminster Bank, service organisations like Post Office Counters and CCTA, utilities like PowerGen and British Energy and telecommunications organisation British Telecom are using the benefits management methodology. Thus, not only is the approach being used by the organisations that actively

participated in their creation but also by organisations who were not directly involved. To date, over 90 organisations have adopted at least elements of the methodology, with several extending its use beyond information systems projects.

Project cycle 4: Continuous development of the benefits management methodology

Today, five years since the research begun, the project is in its fourth cycle. Regular review workshops on current benefits management practice are undertaken to provide a forum both for debate, exchange of experiences, and initiate further research to generate new insights and refine existing models and tools. Such experience and lessons are continually incorporated into the methodology to reflect the evolution of information systems and organisational contexts. The scope of the project has now been expanded to focus not only on information systems projects but to explore the creation of benefits-driven information systems strategies.

6.2. Illustrating the Application of the Participatory Research Principles

As we have shown earlier in the paper, the participatory paradigm pursues a set of distinct principles at the ecological, epistemological, spiritual, aesthetic, political, methodological, and practical level (see Table 2). In order to make explicit the application of the paradigm in practice, we will show how these principles informed the research project presented above.

Ecological Principle. From initiation through to completion of each cycle, the research was motivated by the desire to support the progression of knowledge in the practice context of information systems. Accordingly, it was the practitioners who sparked off the idea and shaped the research agenda by their experiences and the lack of knowledge they felt existed. The increasing and sustained use of the methodology developed in this research testifies to the value of the knowledge created and its impact on the improvement of practice.

Paradigmatic principle	Implication for research practice
Ecological	• Motivation for sustainable scientific and technological progress.
Epistemological	• Validation of research results through co-creation and co-implementation.
Spiritual	• Commitment to using science to the improvement of human condition.
Aesthetic	• Conscious of the beauty of the world, its aesthetic, and our participation in it.
Political	• Research subjects are recognised for their capacity for knowledge creation.
Methodological	• All participants are co-researchers and co-subjects.
Practical	• Admission to the obtrusiveness of research into the empirical world

Table 2: Paradigmatic principles in participatory research and their application

Epistemological Principle. The validation of the knowledge and models created from the research cycles occurred through a number of mechanisms. The research teams not only co-created the models and tools in the inquiry process but also co-implemented them in the practice context. The shared collection and analysis of the data helped to develop interpretations that were inter-subjectively valid.

Spiritual Principle. In representing the reality of the practitioners throughout the entire research process, the findings were recognisable by the business community and thus helped improve information systems practice.

Aesthetic Principle. The participatory method accounts for the human consequences of technology. In developing the outcomes from the research *through* the stakeholders and *for* the stakeholders, people were provided with the opportunity for shaping their immediate reality.

Political Principle. Rather than placing the practitioner community at the receiving end of the knowledge creation process, they were recognised for their capacity for building knowledge. The democratic nature of the research process entails that all engage in data collection, contribute insights and provide interpretations.

Methodological Principle. The practitioners were true co-researchers in participating in the selection and absorption of the literature, the collection of empirical evidence, the building of concepts from the data, and the interpretation of the findings and their meaning for the practice context.

Practical Principle. Participatory inquiry is experiential and all the results from the research are grounded in the practical experience of the participants in their organisational context.

7.   CONCLUSIONS

Information systems research has suffered from a lack of relevance as a result of the positivist hegemony with its separation of the scientist, as the objective analyst, from the research subjects. Separation is seen in the participatory worldview as the central reason for the production of idealised models that have limited relevance to the empirical world, a view which has not only been articulated in sociology (Heron, 1981; Reason, 1993, 1998) and philosophy (Skolimowski, 1994) but also in information systems research (Ciborra, 1998).

Indeed, the increasing recognition of the need for practical relevance of research by the information systems community has favoured the trend towards methodological pluralism (Mumford *et al*., 1985; Klein *et al*., 1991; Landry and Banville, 1992) and encouraged researchers to experiment with alternatives, for example interpretivism (cf. Orlikowski, 1991; Walsham, 1995), phenomenology (cf. Boland, 1985), structuralism (cf. Walsham and Han, 1990) and critical theory (cf. Ngwenyama, 1991). While methodological pluralism has introduced a refreshing diversity in theoretical perspectives and thus enriched our understanding of the field, it has, however, made a limited contribution to the production of practically relevant knowledge because of their preoccupation with understanding of the social world.

Participatory approaches, in contrast, go beyond the mere elicitation of social constructions and meaning systems in committing to the practical implementation of the outcomes of the research. The open, collaborative and cyclical conduct of the inquiry by the researcher and the social actors, who engage in the dual roles of co-researchers and co-subjects, ensures not only the validation of the inquiry process and its outcomes but also the determination of reality in terms that are meaningful and relevant to practice.

In presenting to the information systems community the participatory worldview and its application to research practice, we have attempted to suggest a system of knowledge production that we view as complementary to existing modes of inquiry, albeit, recognising the fact that there will always be "natural limitations associated with different ways of knowing" (Evered and Louis, 1981, p393).

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