

Combining IS Research Methods: Towards a Pluralist Methodology

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This paper puts forward arguments in favor of a pluralist approach to IS research. Rather than advocating a single paradigm, be it interpretive or positivist, or even a plurality of paradigms within the discipline as a whole, it suggests that research results will be richer and more reliable if different research methods, preferably from different (existing) paradigms, are routinely combined together. The paper is organized into three sections after the Introduction. In §2, the main arguments for the desirability of multimethod research are put forward, while §3 discusses its feasibility in theory and practice. §4 outlines two frameworks that are helpful in designing mixed-method research studies. These are illustrated with a critical evaluation of three examples of empirical research.

(*Critical Pluralism; IS Research Methods; Methodology; Multimethodology; Paradigm; Qualitative Research; Critical Realism*)

1. Introduction

The question of which research methods are most appropriate for information systems research has been a focus of concern for some time. Orlikowski and Baroudi (1991) considered three broad research paradigms—positivist, interpretivist, and critical—and found that between 1983 and 1988 97% of IS research articles used a positivist framework. Since then there has been growing interest in, and commitment to, a range of nonpositivist (sometimes called post-empiricist) approaches, particularly based on interpretivism. This is evidenced by a shift in the editorial policy of some of the main IS journals, notably MISQ (Lee 1999, Walsham 1995), and a recent literature survey (Nandhakumar and Jones 1997) that found that 16% of papers used a broadly interpretive methodology. For general coverage of a variety of methods and paradigms see Nissen et al. (1991), Galliers (1992), and Goles and Hirschheim (1999). For recent papers in favor of interpretivism see Avison and Myers (1995), Harvey and Myers (1995), and Myers (1994); for a survey of the critical perspective in IS see Ngwenyama and Lee (1997).

In part this diversity of approach is because information systems, broadly defined, draws on and provides a nexus for many diverse research fields and disciplines. IS is much more than simply the development of computer-based business systems—electronic and information technology is now so fundamental within society that IS as a discipline must concern itself with the general evolution of human communication (Mingers and Stowell 1997). Thus, it has to draw upon a very wide range of disciplines—technology, psychology, economics, sociology, mathematics, linguistics, semiotics—that encompass very different research traditions. This puts IS in a position similar to other management areas such as organizational studies, which are also characterized by a plurality of research paradigms, each with particular research methods. Consideration then turns to the possible relations between these paradigms. The traditional view, particularly since Burrell and Morgan's (1979) seminal analysis of paradigms in organization theory, has been one of *isolationism* in which the paradigms are seen as essentially based on mutually exclusive and contradictory

assumptions, and individual researchers do, or should, follow a single paradigm. This principle is sometimes justified in terms of the superiority of the (usually positivist) paradigm but, more recently, Benbasat and Weber (1996) have argued in terms of the need for uniformity within the IS discipline as a whole:

Our own view is that we need both a paradigm (one or more) and diversity in the IS discipline. A paradigm will serve to provide coherence to the IS discipline and to characterize the phenomena that make it different from other disciplines. In short, it is needed to articulate the core of the discipline (p. 397).

Without this, they fear, the discipline will shatter or be taken over by a more established discipline.

In contrast, Robey (1996) argues that a diversity of research methods and paradigms within the discipline is a positive source of strength. This is primarily because diversity provides a wider range of knowledge traditions upon which to base research and theory, which is particularly important in a discipline like IS which deals with real-world complexities. Robey accepts, however, that such an approach also needs a "disciplined methodological pluralism" (Landry and Banville 1992) to avoid becoming totally unrigorous and anarchistic. This *complementarist* position asserts that no one paradigm is superior, but that their individual rationalities should be respected within the discipline as a whole. Different approaches may be more or less appropriate for particular situations or topics and, therefore, there should be some process of choice between them.

... theoretical foundations for research and specific research methods are justified by research aims, or purposes. They should *not* be chosen because they conform to a dominant paradigm or because the researcher believes in their intrinsic value. Rather theory and method are justified on pragmatic grounds as appropriate tools for accomplishing research aims. (Robey 1996, p. 406)

A third possibility, and the one espoused in this paper, is that different research methods (especially from different paradigms)¹ focus on different aspects of reality and therefore a richer understanding of a research topic will be gained by combining several methods

¹The relation between paradigms and methods is discussed below.

together in a single piece of research or research program.² This position has been supported within IS by a number of authors (Galliers 1993, 1994, 1991, Landry and Banville 1992, Lee 1991), and as long ago as 1985 Lyytinen and Klein argued that the hermeneutic and empirical-analytic traditions should be brought together. But, as Smithson (1991, p. 368) laments,

... despite considerable concern over the methodological shortcomings of IS research and the attraction of combining different approaches, the topic is relatively rarely discussed in the IS literature. It would seem that researchers seldom combine approaches or, if they do, the implications are not highlighted in their reports.

The paper is organized into three main sections. In §2, the main arguments for the desirability of multi-method research are put forward, while §3 discusses its feasibility in practice. Section 4 provides a more substantive contribution to multimethod research by outlining two frameworks that may be helpful in designing mixed-method research studies. These are illustrated with a critical evaluation of three examples of actual empirical research.

1.1. Definition of Terms

To make the position advocated in this paper as clear as possible, I shall define some terms to be used and also provide a summary of the main arguments. Words such as "paradigm," "methodology," "method," and "technique" are open to many interpretations, so while I shall endeavor to use the following definitions consistently, it must be recognized that these are not claimed to be "correct" in an absolute sense. Inevitably, some latitude will be required in applying them across a variety of domains.

Research is conducted by undertaking particular activities such as administering and analyzing a survey, conducting controlled experiments, doing ethnography or participant observation, or developing root definitions and conceptual models. These basic activities are *research methods* or *techniques* (using the terms synonymously). They are generally well-defined sequences

²This approach is called "multimethodology" by Mingers and Gill (1997).

of operations that if carried out proficiently yield predictable results (Checkland 1981, Livari et al. 1998). However, there is often a confusion between the terms “method” and “methodology.” Sometimes they are simply used, imprecisely, as interchangeable (for example, in Tashakkori and Teddlie (1998) or Livari et al. (1998)), while, as Livari et al. (1999) point out, there are also differences in usage between North America and Europe.

For this paper it is useful to distinguish three connotations of the term *methodology*. (i) The most general is “method-ology,” meaning the study of methods (Checkland 1981). One might use this meaning to refer to a course in Research Methodology which covered a whole range of different methods. (ii) The most specific meaning is when talking about “the methodology” of a particular research study, e.g., Tashakkori and Teddlie (1998). In this case the term refers to the actual research method(s) used in a certain piece of research. In this sense, every study has its own individual methodology. (iii) The third usage is a generalization of the second. Particular combinations of methods occur many times in practice, or are deliberately designed a priori and come to be called “a methodology.” Examples of the former are Soft Systems Methodology (Checkland and Scholes 1990) and Grounded Theory (Miles and Huberman 1994), while an example of the latter is Multiview³ (Avison and Wood-Harper 1990). Using the term in this way, “a methodology” is more general and less prescriptive than a method. It is a structured set of guidelines or activities to assist in generating valid and reliable research results. It will often consist of various methods or techniques, not all of which need be used every time. It can be difficult to precisely delineate the boundaries between method and methodology at one end (e.g., which is administering and analyzing a survey?), or between methodology and a general research approach⁴ (e.g., “qualitative research methodology”) at the other. This paper is generally concerned with combining research *methods*,

but it is also possible to combine these more generic *methodologies*.⁵

Research methods (and therefore methodologies) make implicit or explicit assumptions about the nature of the world and of knowledge. It has been conventional since Kuhn (1970) to call particular combinations of assumptions *paradigms*. Kuhn’s work in the natural sciences presupposed that paradigms generally succeeded one another. But, in the social sciences, Burrell and Morgan (1979) constructed a set of antithetical paradigms that could exist simultaneously. A paradigm is thus a construct that specifies a general set of philosophical assumptions covering, for example, ontology (what is assumed to exist), epistemology (the nature of valid knowledge), ethics or axiology (what is valued or considered right), and methodology (Livari et al. 1998, Mingers and Brocklesby 1997, Tashakkori and Teddlie 1998). There can only be a relatively small number of paradigms extant within a discipline at one time, although the actual number and their characterization in terms of underlying dimensions differs between authors.⁶ This paper uses the idea of different paradigms to emphasize the desirability of combining together methods that have distinctively different assumptions, but does not wish to remain wedded to the particular paradigm boundaries that exist at the moment.

1.2. Summary of Argument

The following points summarize the arguments made in the rest of the paper.

1. Research methods can be seen as instruments for provoking a response from the world. The nature of

⁵In the rest of the paper *methodology* will mean generic methodology. When referring to the specific methodology of an actual study, we will use *methodology*^s.

⁶All commentators distinguish at least two paradigms—positivist (empirical-analytic, objectivist, functionalist) and interpretive (subjectivist, constructivist)—e.g., (Lee 1991). Several other commentators add another, critical (Orlikowski and Baroudi 1991) or pragmatism (Robey 1996, Tashakkori and Teddlie 1998). Many distinguish four; functionalist, interpretive, radical humanist, radical structuralist (Burrell and Morgan 1979, Hirschheim and Klein 1989), or normative, interpretive, critical, dialogic (Deetz 1996). See also, Blaike (1991), Keat and Urry (1981), Pepper (1942), and Smaling (1994).

³Note that this is an information systems design methodology rather than a research methodology.

⁴A useful classification of methodologies and approaches has been developed in the slightly different context of information systems design (Livari et al. 1998, 1999).

the response depends on both the world and the instrument. Different methods generate information about different aspects of the world. The information is used to construct theories *about the world*, which in turn condition our experience *of the world*. It is both desirable and feasible to combine together different research methods to gain richer and more reliable research results.

2. However, it is commonly held that research methods are bound to particular paradigms and that the paradigms themselves are incommensurable, and, therefore, it is logically incoherent to mix together methods from different paradigms. Even some pluralists argue that the integrity of paradigms must be respected when different methods are used.

Contra this view, I argue that:

2.1. *Paradigms* are simply constructs of our thought. To hold that the world must actually conform to one of them is to commit the *epistemic fallacy* (limiting what may exist to our current knowledge) or, more generally, the *anthropic fallacy* (defining *being* or *existence* only in relation to human *being*) (Bhaskar 1978). The world is almost certainly more complex than we do, or possibly can, know.

2.2. Arguments about paradigm incommensurability have been overstated—there is no agreed way of defining different paradigms. Kuhn's version of paradigms is different from and less restrictive than Burrell and Morgan's, and there are many examples of intertranslation between paradigms. The paradigm concept is useful as a shorthand for a particular constellation of assumptions, theories, and methods, but it is purely an heuristic device.

2.3. In any case, it is possible to detach research methods (and perhaps even methodologies) from a paradigm and use them, *critically and knowledgeably*, within a context that makes different assumptions.

2.4. In doing this, we do not have to accept the integrity of extant paradigms because their assumptions are always limited and, therefore, the subject of critique. Nor do we have to (or could we) adopt some assumption-free metaparadigmatic stance that adjudicates between them. Rather we need to develop new paradigms, with their own assumptions and commitments, which draw on the strengths and weaknesses

of the current ones, recognizing the plurality and diversity of the world. Critical pluralism, based on Bhaskar's critical realism, is a step toward this.

2.5. Finally, any discipline that researches aspects of the *social* world must inevitably have a *critical* potential in that the social world of meanings and practices (the object of social science) is intrinsically *value-laden*, and social research will inevitably question society's and individuals' self-understandings.

2. Desirability of Multimethod Research

This section puts forward arguments as to why multimethod research is desirable for information systems. Landry and Banville (1992) have made strong arguments in favor of pluralism in general, but it should be noted that the term "methodological pluralism" may be conceptualized in a number of different ways. (i) Loose pluralism, holding that the IS discipline as a whole should support and encourage a variety of research paradigms and methods within it, but should not specify how or when they be used. (ii) Complementarism, where different paradigms are viewed as internally consistent, and based on different assumptions about their context of use, such that each paradigm would be seen as more or less appropriate for a particular research situation. And, (iii) strong pluralism, as advocated in this paper, where all research situations are seen as inherently complex and multidimensional, and would thus benefit from a range of methods.

Two main arguments in favor of strong pluralism are put forward and used in the construction of a research framework in §4. The first is that the real world is ontologically stratified and differentiated (Bhaskar 1994), consisting of a plurality of structures that generate the events that occur (and do not occur). Different paradigms each focus attention on different aspects of the situation, and so multimethod research is necessary to deal effectively with the full richness of the real world. The second argument is that a research study is not usually a single, discrete event but a process that typically proceeds through a number of phases. These phases pose different tasks and problems for the researcher. However, research methods tend to be more

useful in relation to some phases than others, so the prospect of combining them has immediate appeal. Even where methods do perform similar functions, combining a range of approaches may well yield a better result.⁷

There are other advantages to multimethod work (Tashakkori and Teddlie 1998)—(i) triangulation—seeking to validate data and results by combining a range of data sources, methods, or observers, (ii) creativity—discovering fresh or paradoxical factors that stimulate further work, (iii) expansion—widening the—scope of the study to take in wider aspects of the situation. But only the two primary arguments will be discussed in more detail in this section. They will also be the basis of a framework explained in §4.1.2.

2.1. The Multidimensional World

Adopting a particular paradigm is like viewing the world through a particular instrument such as a telescope, an X-ray machine, or an electron microscope. Each reveals certain aspects, but each is blind to others. Although they may be pointing at the same place, each instrument produces a different, and sometimes seemingly incompatible, representation. Thus, in adopting only one method, one is often gaining only a limited view of a particular research situation. For example, attending only to that which may be measured or quantified, or only to individuals' subjective meanings and thus ignoring the wider social and political context. This argument is a strong one in support of multimethod research, suggesting that it is always wise to utilize a variety of approaches.

A framework has been developed from Habermas's (1979, 1984, 1987, 1993) theory of communicative action and is shown in Figure 1. Habermas's work has long been accepted as a basis for a critical approach within IS (Hirschheim et al. 1996, Ngwenyama and Lee 1997) and is one of the two or three dominant schools of thought within social theory itself. His more recent work has concerned itself with the pragmatics of human communication (and its implications for ethics) and is thus particularly suited to IS. Habermas (1984)

argues that the distinctive nature of humans is their ability to communicate and debate through language, and he calls this activity *communicative action*. Its fundamental purpose is achieving and maintaining *understanding* amongst those involved. There are, of course, other types of action—instrumental (aimed at achieving personal goals in a nonsocial way), strategic (aimed at influencing other actors to achieve one's goals), and discursive (aimed at reestablishing agreement after a breakdown).

Habermas (1984) analyses communicative action, not abstractly in terms of syntax or semantics, but as real, purposeful, pragmatic interaction between social subjects. He is concerned with actual utterances made by speakers engaged in a social process, and argues that such utterances implicitly raise or embody particular validity claims. These claims can always be challenged or questioned, and the speaker must be prepared and able to justify them for the utterance to be acceptable. Four validity claims are distinguished: *comprehensibility*, *truth*, *rightness*, and *sincerity*. Comprehensibility simply means that the utterance be understandable to a competent speaker of the language. The other three refer to relations between the utterance and three different worlds—the *objective* world of actual and possible states of affairs, the *social* world of normatively regulated social relations, and the *subjective* world of personal experiences and beliefs, respectively.⁸

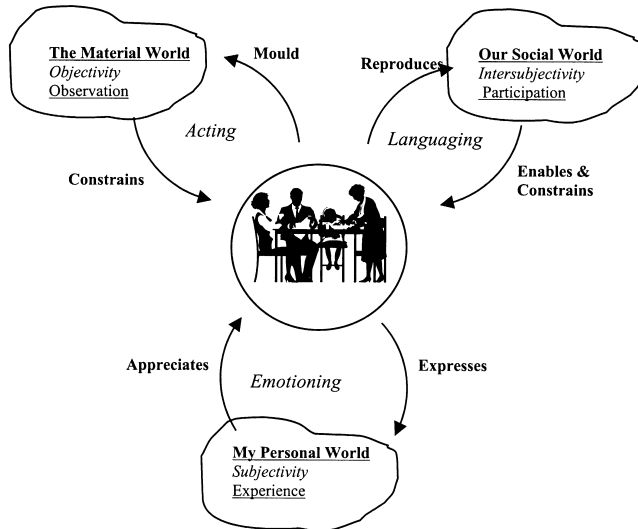
Thus, an acceptable communicative utterance must be understandable; it must be true with respect to an objective world; be based on valid social norms that are considered right; and be meant sincerely in reflecting the speakers beliefs. A listener may question any of these claims leading to further utterances aimed at justifying them that may, themselves, be questioned. The process as a whole is seen as an ideal type for rational communication in which the "force of the better argument" (Habermas 1990) should eventually hold sway.

If we broaden Habermas's theory from considering only utterances towards research activity in general, then we can categorize research methods in terms of

⁷Although this paper focuses on single pieces of research, it is recognised that often studies form part of larger research programmes. It should be easier to combine methods across programmes—see §3.4.

⁸These three worlds are related to Popper's worlds 1, 2, 3. The differences are discussed in Habermas (1984, p. 76)

Figure 1 Three Worlds Relevant to Research Methods (Developed from Work by Habermas)



their relationship to the three worlds—the *material* world, the *social* world, and the *personal* world (see Figure 1). Each domain has different modes of existence and different epistemological possibilities. The material world is outside and independent of human beings. It existed before us and would exist whether or not we did. We can shape it through our actions, but are subject to its constraints. Our relationship to this world is one of *observation* (rather than participation or experience), but such observations are always theory and subject dependent. We can characterize this world as objective in the sense that it is independent of the observer, although clearly our observations and descriptions of it are not.

From this material world, through processes of evolution, linguistically endowed humans have developed, capable of communication and self-reflection. This has led to the social and personal worlds. The personal world is the world of our own individual thoughts, emotions, experiences, and belief. We do not observe it, but *experience* it. This world is subjective in that it is generated by, and only accessible to, the individual subject. We can aim to express our subjectivity to others and, in turn, appreciate theirs. Finally there is the social world that we (as members of particular social systems) share and *participate* in. Our relation to it is one of intersubjectivity because it is, on

the one hand, a human construction, and on the other, it goes beyond and preexists any particular individual. It consists of a complex multilayering of language, meaning, social practices, rules, and resources that both enables and constrains our actions and is reproduced through them. One of its primary dimensions is that of power (Mingers 1992).

2.2. Research As a Process

The second argument is that research is not a discrete event but a process that has phases or, rather, different types of activities, which will predominate at different times. Particular research methods are more useful for some functions than others, and so a combination of approaches may be necessary to provide a more comprehensive research outcome. To help do this in practice, some categorization of the phases of a research study would be useful, against which could be mapped various research methods' strengths. Producing such a classification of research activities is difficult because research in general is so diverse—from library-based literature reviews; through experimentation, surveys, and ethnography; to action research or critical intervention in real-world organizations. So, any such typography needs to be very abstract. Galliers (1991) produced one possible framework, but that was considered to be too specific to a small number of particular techniques. He also produced a revised version that is more general (Galliers 1996) split into "gathering data" and "distilling data," but this still does not cover action-oriented research. An analysis of the general process of research and intervention, based on work of Bhaskar (1979), Maturana (1990), and Tashakkori and Teddlie (1998), led to the identification of the following four phases:

- *Appreciation* of the research situation as experienced by the researchers involved, expressed by any actors in the situation, and prior literature and theories. This will involve the identification of the experience or phenomena to be explained, initial conceptualization and design of the study, and the production of basic data using methods such as observation, interviews, experiments, surveys, or qualitative approaches. Note that this cannot be an "observer-independent" view of the situation "as it really is." It will be conditioned by the researcher's previous experience and their access to the situation.

- *Analysis* of the data produced so as to understand the history that has generated it, and the particular structure of relations and constraints that maintain it. This will involve analysis methods appropriate to the methodology^s of the study and the data produced in the first stage. Explanation will be in terms of possible hypothetical mechanisms or structures that, if they existed, would produce the phenomenon that has been observed, measured, or experienced.

- *Assessment* of the postulated explanation(s) in terms of other predicted effects, alternative possible explanations, and, within action research, consideration of ways in which the situation could be other than it is. The assessment phase also involves interpretation of the results, and inference to other situations.

- *Action* to report on and disseminate the research results and, if necessary or desired, to bring about change to the situation.

Put crudely, these phases cover: What is happening? Why is it happening? How could the situation or explanation be different? And, so what? We should emphasize immediately that these activities are not seen as discrete stages that are enacted one by one. Rather, they are aspects of the research study that need to be considered throughout, although their relative importance will differ as the project progresses. Equally, different studies will place their emphasis at some stages rather than others.

To conclude this section, the proposition that a range of research methods will provide richer and more reliable results seems to be widely supported. Lewis and Grimes (1999), in a wide-ranging survey, classify such work into multiparadigm reviews that seek to reveal the often implicit background assumptions of theories and research, multiparadigm research in which methods from different paradigms are deliberately used together, and metaparadigm theory building in which “the goal is a more rich, holistic, and contextualized purview” (p. 675). Even Benbasat and Weber, who are concerned about excessive diversity within the discipline, concede that, “(i)n this regard, we cannot conceive of how any one paradigm (or a small number of paradigms) could ever account for all the phenomena that are properly the concern of members of the IS discipline” (Benbasat and Weber 1996, p. 397).

So, is there in fact a problem? Perhaps much multimethod, multiparadigm research already occurs.

2.3. How Common Is Multimethod Research?

To answer this question, an empirical review of the main IS journals was carried out specifically to evaluate the extent of multimethod research. This study complemented similar reviews by Walsham (1995) and Nandhakumar and Jones (1997) that delve into the prevalence of interpretive research. Full details of the survey will be reported elsewhere; this paper only presents a brief summary. Six journals were selected—*MIS Quarterly*, *Information Systems Research*, and *Communications of the ACM*, as the leading American journals; *Information Systems Journal* and *European Journal of IS* as the European ones; and *Accounting, Management and IT* as a more eclectic one. All papers between 1993 and 1998 were surveyed to record (i) if there was empirical research (as opposed to theory, methodology, literature review); (ii) the particular methods used; and (iii) the occurrence of multiple methods.

Roughly two-thirds of papers contained some form of empirical research, and the dominant forms of research were surveys, interviews, experiments, and case studies accounting for over 80% of recorded examples.⁹ Other more specific research methodologies, such as participant observation, grounded theory, or soft systems methodology, were almost entirely absent. There was also evidence of differences between journals, with *ISR* and *CACM* being most oriented toward quantitative approaches and *ISJ* and *AMIT* toward interpretive. In terms of research combinations,¹⁰ the overall results show that around 13% of those papers that have definite empirical content used more than one research method. This in itself is quite a small proportion (and shows no overall trend over the years

⁹Methods of data *analysis*, such as multivariate statistics, were not counted as separate research methods because they can only be used in combination with a data-generating method.

¹⁰This is to some extent a subjective exercise because some research methods almost inevitably go together. For example, some type of observation or measurement almost always occurs, and interviews go hand-in-hand with case study research and, to some extent, surveys. Equally, the actual classification of methods as being a particular type requires judgement because different terms may be used for similar methods, and some papers are unclear as to their actual methodology^s.

surveyed), but when the detail of particular combinations is considered, it becomes even less impressive. Of 122 recorded combinations, 75% involved only surveys, interviews, and/or case study research, which (as mentioned above) almost inevitably go together. Thus, the general picture is not one of a wide diversity of different approaches and methods as sometimes portrayed (Benbasat and Weber 1996, Robey 1996), but rather a narrow spectrum centered around traditional approaches with very little by way of cross-paradigm linkages. Why is this the case when so many people are, in general, in favour of research diversity? Some possible answers are given in the next section.

3. Feasibility of Multimethod Research

Having put forward arguments for the desirability of multimethod research, we must also recognize the inherent problems and assess its overall feasibility. We should remember that we are concerned particularly with linking research methods that would normally be seen as belonging to different research paradigms. Four levels of problems can be identified: (i) *philosophical*—particularly the issue of paradigm incommensurability; (ii) *cultural*—the extent to which organizational and academic cultures militate against multimethod work; (iii) *psychological*—the problems of individual researchers who are often only comfortable with a particular type of method; and (iv) *practical*. Each of these is a major research area in its own right, and in this paper all we hope to do is outline the main debates and provide at least prima facie evidence that the problems are not insurmountable. More detailed arguments will be found in Mingers and Brocklesby (1997).

3.1. Philosophical Feasibility—Paradigm Incommensurability

The paradigm incommensurability thesis asserts that because paradigms differ in terms of the fundamental assumptions they bring to organizational inquiry, researchers must choose the rules under which they do research from among the alternatives on offer. They must then commit themselves to a single paradigm, although sequential movement over time is permissible. Multimethod research is proscribed for a number

of reasons, the most notable of which is the supposedly irreconcilable objectivist/subjectivist ontological and epistemological dichotomies that exist between the empirical-analytic and interpretive paradigms, respectively. There are other related dichotomies, such as structure versus agency, determinism versus voluntarism, causation versus meaning, and object versus subject. The opposing positions in each dichotomy represent alternative competing “truths” about the world and, as such, they resist reconciliation or synthesis (see Tashakkori and Teddlie 1998).

In recent years, however, several arguments have been put forward within philosophy, social theory, and organization studies against a strong view of paradigm incommensurability. First, it is argued that the characterization of paradigms as separate and mutually exclusive domains may have been overstated (Gioia and Pitre 1990). Although the central prototypical characteristics are incommensurable, paradigms are permeable at the edges, in their so-called “transition zones.” It is possible, these authors argue, to “construct bridges” across paradigm boundaries that are ostensibly impenetrable. Moreover, the distinctions that are generally drawn between different paradigms are themselves fuzzy and highly questionable, and there is no one agreed-upon set of paradigms (Smaling 1994). Second, it is not necessary to accept that research methods are wholly internal to a single paradigm (Mingers and Brocklesby 1997, Smaling 1994). Rather, it is quite possible to disconnect a particular method from its normal paradigm and use it, *consciously and critically*, within another setting. For example, the use of quantitative data need not imply the acceptance of a positivist, objectivist epistemology. Rather, such data can (and should) be interpreted in the light of relevant social meanings, and their production as a social construction.

Third, it is claimed that the whole idea of paradigm incommensurability based upon the objective-subjective duality is fundamentally flawed (Orlikowski and Robey 1991, Weaver and Gioia 1994). Giddens’ structuration theory has been used to demonstrate that it is not possible to separate out objective and subjective dimensions. Reality, according to structuration theory, emerges out of the dialectic interplay of forces of structure and meaning (structural regularities are created out of subjective meanings, and through socialization

processes, structures then “act back” upon individuals’ meanings). Finally, generalizing the previous argument, different paradigms provide us with different perspectives or insights into a reality that is forever more complex than our theories can capture (Booth 1979, Guba 1990, Smaling 1994). It is, therefore, quite wrong to wholly accept the postulates of any one paradigm.

The philosophical position that underpins the arguments of this paper has been called “critical pluralism” (Mingers 1997, 1999) and it can encompass multiparadigm research combinations such as intensive/extensive (Layder 1993, Sayer 1992) or distant/engaged (Nandhakumar and Jones 1997). It emphasizes an acceptance of plurality at many levels—philosophical, social, methodological—but also grounds this from a perspective that adopts a critical stance towards the necessity and validity of current social arrangements. This is clearly seen as a new paradigm; it is not metaparadigmatic. Nor does it take the extant paradigms’ assumptions at face value—for example, that quantitative data could be pure, unmediated reflections of an external reality. This critical pluralist perspective has been developed from the critical realism¹¹ of writers such as Bhaskar (1979, 1989, 1994), Keat and Urry (1981), combined with the biological and cognitive theories of Maturana and Varela (1980, 1987, Mingers 1995, 2000a).

3.2. Cultural Feasibility—Paradigm Subcultures

The question here is whether the existing cultural constitution of the information systems community—the extent to which it is split into paradigm subcultures—will facilitate or act as a barrier against the widespread adoption of multimethod as a research strategy. Obviously, this depends upon the size of the “cultural gap” between where we are now, and where—in relation to multimethod research—we would like to be. This issue has been discussed in some detail with regard to the domain of management science (Brocklesby 1994, 1995, Brocklesby and Cummings 1995). Certainly research within IS (Banville and Landry 1989, Galliers 1994, Harvey and Myers 1995, Landry and Banville

1992, Myers 1994, Orlikowski and Baroudi 1991) does show that it has a fragmented character with general dominance, particularly in the United States, of a positivist subculture. It would seem that few of our colleagues are trained across two or more paradigms or work in groups where the sorts of multimethod research we have described are widely practiced. Most have hard science or strongly technological backgrounds, although some have moved into IS from social science. Applegate’s and King’s (1999) description of the problems faced by a junior researcher trying to undertake nonstandard research is an excellent illustration of paradigm subculture at work.

Some recent empirical evidence in the United Kingdom is both interesting and surprising. Galliers et al. (1997) report on a survey of United Kingdom IS academics (the sample frame was the 535 members of the UKAIS, of whom 20% replied), part of which dealt with academic background and use of research methods. Surprisingly (in comparison with the above research), nearly 70% came from a *social* science background (36% economics), and a further 21% came from operational research. Almost none had a specifically technical or scientific training. Given this, it is not surprising that the most common research area was in the organizational and human impact if they were in IT (16%) and that the most commonly used research methods were intensive ones such as case study, interviews, and qualitative analysis (41%). The most common epistemological positions were interpretivism (40%) and “common sense/ad hoc” (12%), with positivism (10%) and pragmatism (10%) following. Finally, the survey specifically asked if research methods were used in combination, and 70% replied “always” or “often”, although no further details are available. The predominance of a social science background is unexpected in the light of common presuppositions that many IS people come from a technical background. There may of course be some bias in the sample—either the UKAIS in general, or the subset who chose to respond—but it would be interesting to replicate this research in the United States, and with IS practitioners rather than academics. The high proportion who regularly combine methods is encouraging, although these may well be methods within a single paradigm.

¹¹The term pluralist rather than realist is simply a matter of emphasis, highlighting its pluralist (especially of research methods) rather than its realist aspects.

This does not mean that the institutionally entrenched single-paradigm, even single-method subcultures that pervade IS are inviolable. Cultures do change, albeit often slowly and in response to specific conditions and events. Perhaps the most basic condition that might trigger the sort of transformation we are talking about would be an unexpected failure in traditional ways of working combined with a consciousness of the limitations of one's preferred paradigm and knowledge of what other options might be available. This, indeed, does seem to be happening following the numerous, well-publicized commercial information systems failures such as the London Ambulance system (Beynon-Davies 1995) and the London Stock Exchange system, *Taurus* (Drummond 1996). Then, of course, there is the question of capability. Changes would have to be made in the curriculum to develop a better awareness of the range of ontological and epistemological options that are available, and to broaden knowledge and research skills. Changes would need to be made in the criteria required to recruit staff. These changes present a number of challenges, but they do not represent insurmountable obstacles.

3.3. Psychological Feasibility—Cognitive Barriers

The next potential difficulty in multimethod research concerns the cognitive feasibility of moving from one paradigm to another. Spanning a wide range of disciplines, there is now an extensive literature that has explored the extant links between personality traits, cognition and research preferences, and the production of knowledge. A major issue raised in this literature is the question of whether entrenched cognitive predilections may be altered to facilitate multimethod research. Research based on a Jungian personality schema (Blaycock and Rees 1984; Nutt 1979, 1986; Slocum 1978; Stumph and Dunbar 1991) suggests that the preferences of the "analytical scientist" type seem to reflect many of the exigencies of doing hard, quantitative research. Empirical studies of these "types," for example, show that they value precision, accuracy, and reliability, and they perform best when they can impose models on a decision situation to specify the relevant data needed and provide formats for logical analysis. The two "feeling" types, the "particular humanist"

and the "conceptual humanist," in contrast, provide a closer approximation to the interpretive/soft systems style of research. Particular humanists, for example, prefer to conduct research via personal involvement with other people; they prefer qualitative data and report through personalized descriptive accounts.

3.4. Practical Barriers

Finally, we must recognize that there are practical but nonetheless real constraints on multimethod research. The current situation seems well captured by Deetz (1996) in a paper on the nature of paradigms within organizational studies. He argues against the traditional epistemological version of paradigms developed especially by Burrell and Morgan (1979), which has dominated organizational and management studies. This, he claims, is too rigid and representational, founded in a strong objective/subjective distinction, and too easily taken as being "true" (or perhaps "false") rather than simply more or less stimulating or interesting. In its place he proposes to identify different discourses¹² (rather than paradigms) that characterize different research communities within organizational research. And, he argues, movement across or between these discourses, while desirable, is very difficult in practice.

Different orientations have developed specific ways of answering the types of questions they pose and do not work terribly well in answering the questions of others. The choice of orientation, to the extent that it can be freed from training histories and department/discipline politics, can probably be reduced to alternative conceptions of social good . . . I, like many others, sometimes wish we were all multilingual, that we could move across orientations with grace and ease, but this type of Teflon-coated multiperspectival cosmopolitan . . . is often both illusionary and weak. (Deetz 1996)

At the same time, academics are increasingly under publication pressure and it is certainly much easier to sell clear-cut, well-defined, monomethod work both to funding agencies and to journals. This is particularly crucial to less senior faculty still needing to establish their reputation and tenure; Applegate and King's

¹²Four discourses are identified—normative, interpretive, critical, and dialogic—based on two underlying dimensions: whether theoretical concepts are local/emergent or elite/a priori, and whether the research is generally focussed on consensus/order or dissensus/conflict.

(1999) vignette of the pressures and conflicts faced by a junior researcher rings very true. In the United Kingdom we have suffered from the Research Assessment Exercise (RAE). This major undertaking aims to assess research quality across all subjects in all universities, and its results are a significant determinant of research funding. However, its crude methodology, largely couched in terms of *numbers* of publications rather than quality, has effectively penalized longer-term, more complex research projects in favor of short-term, often trivial, journal articles. It is also true, of course, that any project must have self-defined or externally given boundaries, and particular questions that it sets out to answer. It cannot aim to discover everything about everything.

However, despite the practical problems raised in this section, I believe that the approach set out in this paper does not ask for the impossible. It simply suggests that in any piece of research, even one in which a tightly drawn research question overwhelmingly implies a particular method, thought be given to the influence of a range of factors in the situation (including the predilections and experience of the researcher), and the extent to which other methods may add to the richness and *validity* of the results. It is certainly true that multiparadigm research *is* occurring increasingly across a range of disciplines—see surveys by Lewis and Grimes (1999), Mingers (2000b) and Tashakkori and Teddlie (1998)—and there is no reason to suppose that the barriers outlined above apply any less to these other disciplines. Also, to some extent these problems can be alleviated when research is organized into a research program. Individual projects may be largely mono-method, but their results and conclusions can be linked to others that adopt a different approach and may be carried out by other researchers, resulting in the overall program being rich and multimethod.

The multimethodology approach should perhaps be viewed as a regulatory goal rather like Habermas's (1970) "ideal speech situation"—an ideal that can be aimed for and can guide our choices without the expectation that it can be wholly fulfilled in actuality. The next sections of the paper offer some exemplars of multiparadigm research and some practical guidance for combining research methods.

4. Practical Guidance for Multimethod Research

We have so far argued that pluralist research is both desirable and feasible, although there are a number of difficulties and problems to be overcome. In this section we will offer some practical guidance on linking together different research methods in a systematic way. The first part describes two frameworks to help in the choice and design of particular research methodologies^s, while the second section illustrates these with three examples of multimethod research.

4.1. Frameworks for Designing Research Methodologies^s

4.1.1. The Research Context. The first step in a project is to design the research methodology^s for that particular study. That is, to decide which methods are appropriate and how they will be linked. Developing on work of Checkland (1981) we can conceptualize a research situation in terms of three notional systems: a *researching system (RIS)*, a *research-content system (RCS)*, and an *intellectual resources system (IRS)*.

The RCS is the particular site or object of the research. It could be one or a number of organizations, part of an organization, a particular country or industry, particular types of IS activity, or some area of academic discourse. When appropriate, it will include the clients or funding bodies for the research together with any stated aims, objectives, or research questions. It will generally be a complex interaction of people, social practices, ideas, knowledge, and technology. The RIS is the particular researcher or researchers engaged within the research situation (some of whom, particularly in action research, may ordinarily be involved in the organization). The IRS consists of those frameworks of theories, research methods, and methodologies that could potentially be relevant to the research situation, although not necessarily within the researchers' current repertoire. It is one of the contentions of this paper that in the development of information systems research, too little attention has been paid to the nature and role of the particular researcher(s) involved in terms of their relationships to both the research situation and the intellectual frameworks available to them. In some ways this is ironic—

the development of interpretive and then critical approaches focused attention on the human actors in the research situation but generally remained silent about the users of the research methods.

There are, as well, three sets of relationships that need to be considered: those between the researcher(s) and the situation, those between research methods and the situation, and those between researchers and method(ologie)s. These three systems and their relations constitute the context at the point of engagement in a research situation. Consideration of these sorts of issues will determine both the initial actions taken and the planning or design of the research (Ormerod 1996c) as a whole. During a study they both condition and change in response to what happens. Thus, they serve as continual reference points for the process of critical reflection that is necessary to structure the research choices made during the process. A series of questions has been developed (Mingers and Brocklesby 1997) to focus attention on the issues and will be illustrated with reference to actual pieces of research in §4.2.

4.1.2. A Framework for Mapping Methodologies. In §§2.1 and 2.2 above on the desirability of multimethod research two important features of research situations were described: their multidimensionality and the different types of activity that need to be undertaken within different phases of research. By combining these two factors, a grid is produced that can be used to map the characteristics of different research methods to help in linking them together (Mingers and Brocklesby 1997). The logic of this framework is that, in principle, a research study could be concerned with the three different worlds—material, personal, and social—and the four different phases. Combining these yields 12 different aspects of a research situation that might need to be addressed or questions that could be answered. For instance, in the first phase of research one is collecting data about the situation. This may relate to the physical and material factors, the beliefs and expectations of individuals within the situation, and the relevant social practices and norms. Different research methods will be appropriate for these domains and will yield quite different forms of data. In the next phase, one is analyzing the data to understand the structures that underlie and

generate the observations and experiences from the first phase. The framework can then be used in two ways: either considering the questions and asking which research methods may be useful in addressing them, or looking at a research method or methodology and mapping it on to the framework to see which areas it addresses, and appraising its relative strength in each box.

I should make it clear that I would not expect all studies to cover all possibilities. In practice, only some will be relevant to a particular study and this will depend on the context as described above—the particular research objectives, the boundaries drawn and the time and resource constraints, the researchers involved and their own competencies and commitments, and the research methods relevant to the situation. The point is that these choices should be made consciously in the light of a full range of possibilities, rather than implicitly from a very limited repertoire.

4.1.3. Generic Research Designs. The framework described in 4.1.2 allows for a very varied combination of research methods, but in practice particular generic combinations of approaches have been found to work well together. Table 1, developed from Mingers and Gill (1997) and Tashakkori and Teddlie (1998), lists these and provides some research instances.

Five generic research strategies are described with an illustration and reference to actual example(s). The point of these is to demonstrate how methods from different paradigms (i.e., qualitative and quantitative) can fruitfully be combined together. Clearly the more complex designs may be better accommodated within a research program comprising several distinct research projects. One is described below.

4.2. Applying the Frameworks—Examples of Empirical Research

To illustrate the above frameworks and to give examples of multimethod research, I will discuss three studies.¹³ The first, Lynne Markus' (1994a) study of the use of e-mail in relation to information richness theory, is a good example of multimethod research, but it is by no means perfect as the various limitations highlighted

¹³These should be taken as good examples of multimethod research but not *exemplars* in the sense of ideals to be aimed at.

MINGERS

Combining IS Research Methods: Towards a Pluralist Methodology

Table 1 Different Types of Multimethod Research Designs (the Example Does Not Necessarily Correspond to the Illustration)

Type of Design	Method Mix	Illustration	Example
Sequential	Methods are employed in sequence with results from one feeding into the later one.	Do a statistically analyzed questionnaire then follow up with some in-depth interviews to better understand the results. Or, undertake ethnographic research and content analysis to design a questionnaire.	(Markus 1994a) (Ngwenyama and Lee 1997) (Carlson and Davis 1998)
Parallel	Methods are carried out in parallel with results feeding into each other	Observation and recording of computer usage together with interviewing and cognitive mapping of users	(Trauth and O'Connor 1991) (Trauth and Jessup 2000)
Dominant (Imperialist)	One method or methodology as the main approach with contribution(s) from the other(s)	An intensive study using ethnography or participant observation with some statistical data analysis in the Appreciation phase	(Sillince and Mouakket 1997)
Multimethodology ^s	A combination of methods, embodying different paradigms, developed specifically for the task	Interviews, data analysis, and questionnaires, combined with root definitions and conceptual models (from SSM), and strategic choice commitment package.	(Ormerod 1995)
Multilevel	Research conducted simultaneously at different levels of an organization and using different methods	Survey of call-center operators and interviews/cognitive mapping with supervisors and managers.	(Taylor and Tashakkori 1997)

below will show. The discussion includes a follow-up study in which Ngwenyama and Lee (1997) show how the data can be further interpreted using critical theory. The second, by Trauth and Jessup (2000), provides a direct comparison of positivist and interpretivist analyses of the same information, while the third, by Ormerod (1995), is a piece of action research,¹⁴ involving several methods, culminating in the development of an IT/IS strategy for a large supermarket.¹⁵

¹⁴Action research involves undertaking activities to meet an organization's objectives, but is distinguishable from *consultancy* in that the researcher contributes to knowledge by reflecting back on the theories underlying the work.

¹⁵I had hoped to include discussion of a significant research program involving different methods and researchers. Unfortunately, I have not been able to find one within the IS literature. One is described in Tashakkori and Teddlie (1998)—the Louisiana School Effectiveness Study. This involved five major phases over 16 years and included a rich mix of qualitative and quantitative data generation and analysis.

EXAMPLE 1—E-MAIL AND INFORMATION RICHNESS THEORY. Information richness theory is well developed and has been the subject of much research. As originally conceived, it claims that communication media (e.g., documents, face-to-face, etc.) differ in the richness of interaction that they support and that, therefore, users will choose particular media depending on the task at hand. In particular, it claims that the higher the level of the task and the more equivocal it is, the more likely that managers are to choose information-rich media such as face-to-face. With regard to e-mail, it has been claimed to be relatively information poor in comparison to, say, meetings or the telephone. Markus' research aimed to investigate these claims within a particular organization, and if the expected pattern of e-mail use was not found, to then consider alternative theoretical explanations of a more social nature, such as critical mass theory and social definition theory. In the following, I will highlight those aspects

of the research that illustrate well a multimethod approach but also point to particular limitations of the work done.¹⁶

The way the particular research methods were used together can be shown using the framework developed in §4.1.2. A questionnaire was used to investigate managers' awareness of the appropriateness of various media, how well this corresponded to information richness theory, and the frequency of e-mail usage. These were analyzed statistically. The content and degree of equivocality of e-mail communication was investigated by a variety of intensive research methods. Grounded theory and interpretive analysis was used on a sample of actual e-mails, and this was followed up by interviews to explore both objective and social aspects.

Methods were used that addressed, in some measure, all three domains. The survey covered material aspects such as the frequency of e-mail usage; the interpretive analysis and interviews explored the meaning of the messages for particular individuals; and the grounded theory and interviews revealed some of the social aspects of e-mail usage. In terms of the four phases, the research concentrated mainly on appreciating the current situation with some attempt at analyzing the underlying structure using the various theoretical explanations. However, the framework and underlying philosophy also reveal limitations of this particular research design.

First, the questionnaire and its statistical analysis have been carried out in isolation from the other methods, following the logic of a positivist approach. Thus, it is simply assumed that the particular language and meanings used in the questionnaire are appropriate and will be interpreted in the same way by all respondents. Equally, in undertaking the statistical analysis and providing, for example, significance levels, it is assumed that the responses simply reflect some objective reality. In fact, this is partially recognized in the post hoc discussion of results: "That the questionnaire was unable to capture socially-defined rules about the

appropriateness of e-mail and telephone use for work-related. . . communication is not surprising . . .". Indeed, it is not. The approach advocated here would be to begin with interpretive and ethnographic research within a particular context to be able to create a more reliable questionnaire, and then to feed back the results to inform a later round of interviews and analysis.

Second, although some attention is paid to the social, as opposed to individual, aspects of the situation, this is fairly limited and restricted to the particular norms of e-mail usage developed within the organization. What is lacking is any consideration of the interaction between this localized context and the wider social practices and relations of power and legitimacy that sustain them. This perspective could be brought in several ways, for example, Giddens' (1984) structuration theory, Habermas's (1987) critical social theory, or Callon and Latour's actor-network theory (Walsham 1997).

In terms of the research context (§4.1.1) it is interesting that in the vast majority of reported research very little information is given about the relationships between the researchers, the methods used, and the research site. From a positivist perspective, these issues are irrelevant or even illegitimate because research results are assumed to arise "purely" from the situation, but from a critical perspective they are crucial in both explaining how the particular work came to happen, and thereby helping to evaluate it.¹⁷ The stated purpose of the research is to investigate how and why senior managers use e-mail. More particularly, the purpose is to put an existing theory (information richness) to a strong test and, if it is found inadequate, to compare it to alternative theories that bring in more social dimensions. What of the researcher's commitments to the research? Although it is described in a fair-handed way, we might surmise that the researcher actually has fairly clear expectations about the likely outcome because several of her cited publications are concerned with questioning the usefulness of information richness theory and with developing one of the alternatives—critical mass theory.

What of the research site and the actors within it? A

¹⁶My analysis relies only on the published paper—some of these points were considered in the research as a whole (personal communication from Markus), and a further description of the research can be found in Markus (1994b).

¹⁷Note that the points raised in this section are not intended as a criticism of this research. Rather, they illustrate the inevitable commitments and limitations of any piece of research.

single organization was chosen (why only one?), and for theoretical reasons it needed to be one in which e-mail was widely used (not common at the time), but not a computer company. Such a company was found and “access gained through the Chairman,” although it is not explained how this happened or why the company should be willing, except that the chairman was clearly an enthusiast for e-mail and had publicly committed the company to it. This obviously had an important effect on behavior within the company because (as explained in the paper) when the chairman left, e-mail usage dropped off. Equally, the fact that the researcher was introduced by the chairman may have influenced the responses she obtained. It is noted that after the chairman left, the researcher no longer had access.

What of the relationship between possible research methods, the researcher, and research situation? No information is given about the researcher’s own knowledge, experience, or predilection for different research methods, but clearly she is comfortable with several from different paradigms. It is argued that information richness theory, which concerns the individual user, requires information about frequency and type of use, and that this is best obtained from a survey, while, the alternatives that are more socially oriented need interpretive methods such as grounded theory. Some awareness of the possible philosophical problems is shown because the study is to be conducted using principles of methodological triangulation, especially Lee (1991). There does not appear to be any consideration of other possible research methods, e.g., soft systems methodology, participant observation, critical hermeneutics, or critical theory.

Moving now to the follow-up study example, Ngwenyama and Lee (1977) make a very similar point in their analysis of some of the e-mail transcripts from Markus’s (1994a) paper using Habermas’s (1979) theory of communicative action. As explained in §2.1, this theory is concerned with the legitimacy of communicative acts in terms of four validity claims: comprehensibility, rightness, truth, and sincerity. Ngwenyama and Lee go beyond an interpretive analysis of the transcripts in terms of the richness of meanings transmitted, to show that implicitly these validity claims are being raised and challenged. This shows even more

than Markus’s own analysis the extent to which e-mail can be used for equivocal, and socially and politically sensitive communications. It also goes beyond analysis of meaning and understanding at the individual level to situating that within encompassing social and political contexts. From a multimethod viewpoint, the example demonstrates the same data being analyzed from quite different theoretical traditions. In terms of generic research designs, the two studies together are an example of the sequential type although, as pointed out, the link between the survey and the interpretive analysis is quite weak.

EXAMPLE 2—GROUP SUPPORT SYSTEMS. The second example (Trauth and Jessup 2000) is of interest because it is a deliberate attempt to compare and contrast positivist and interpretive analysis of the same information. It can best be seen as an example of a parallel design because the two analyses were carried out separately on the same set of data, but the conclusions were then combined to generate a richer understanding. It is to some extent artificial as the main aim was the comparison of methods rather than substantive learning about the research situation. The research context was a U.S. university where an issue about gender equality in management and promotions had arisen, generating considerable tension and emotion. As part of the university’s response, several computer-supported discussion sessions (GSS) were held, facilitated by one of the researchers. It was hoped that the relatively anonymous format would encourage an open discussion. Although a general invitation was extended, relatively few people chose to attend, the vast majority being women in nonsenior roles. Nothing was ever done with the information collected.

The data available was thus the transcripts of the GSS sessions. According to Trauth and Jessup, a positivist analysis of this data assumes that the sessions have a well-defined and known task—idea generation and evaluation, and consensus building. It then sets out to measure how well this has been achieved by setting up an a priori coding scheme—available in the literature (Connolly et al. 1990)—and then mechanically assigning participants’ comments to the categories. The scores can then be analyzed statistically. The results appeared to show that there was a high

degree of participation and engagement; ideas were challenged but with little overt conflict; and consensus about practical changes was generated.

In contrast, the interpretive analysis imposed no external categories, but aimed to surface and understand the *meaning* of the various interactions to the individual participants themselves within their particular organizational context. It tried to establish an insider's rather than outsider's view. Several interpretive methods were used (ethnography, hermeneutics, participant observation, and grounded theory) in an extremely detailed and intensive study of the transcripts. Small sections ("strips" (Agar 1986)) were analyzed not only for their obvious cognitive content, but also for other layers of meaning such as sarcasm or irony, and the process was repeated through iterations of the hermeneutic circle. The results of the interpretive analysis revealed a very different picture from the positivist. Participation was biased and unrepresentative; engagement was high but emotionally charged; there was little consensus, but there were widely different perceptions of the nature of the problem and possible solutions; the level of conflict was high with considerable degrees of sarcasm; anonymity was low as people who knew each other sat together; and the sessions were not judged as particularly useful.

In relation to the argument of this paper, the research demonstrates clearly the way in which different methods, even when applied to the same data, yield very different pictures of the world. Here, the positivist, extensive approach provides a very superficial analysis of what is a very complex social and political situation. The intensive, interpretive analysis gets at the underlying structures and processes and, to some extent, explains the surface appearance. In terms of the research context, (4.1.1) it is interesting to note how the research method affects the relationship between researcher and situation. From a positivist perspective, there should be no relationship—as the authors say, coding should ideally be done by a disinterested third party. But, in an interpretive analysis the role of interpreter must be acknowledged. Here, the authors are admirably clear that they were intimately involved in the situation—working in the university, having a research interest in gender, and facilitating the sessions. However, they are less reflective about their choice of

methods either in the original GSS work—why GSS rather than some other form of action research (e.g., SSM) or facilitated workshop (e.g., cognitive mapping)? Or in the later analysis—why this particular form of positivist analysis? One presumes from the backgrounds of the researchers that it was familiarity, rather than a considered choice of appropriate methods.

Looking at the mapping framework (§4.1.2), we can see that the primary research situation (i.e., the gender problem) was mainly concerned with the social world (roles, practices and power relations, and the personal world) meanings and emotions. And we can see that it was originally intended as part of a process of change, thus requiring all four phases of appreciation, analysis, assessment, and action. In this context, the use of GSS systems can be appropriate as they help with surfacing individual's beliefs and meanings, and with generating possible alternatives. However, by themselves they tend to focus on the personal and ignore the more systemic aspects of organizational and societal structure. This would particularly be the case here, where gender issues are not peculiar to this particular situation. This should have led to the use of complementary methods, such as critical systems heuristics (CSH) (Ulrich 1994) or actor network theory (Walsham 1997). It is not surprising that the results from the GSS sessions were ignored. In terms of analysis, it was also to be expected that positivist methods would reveal little of significance in such a contentious and emotive situation. But equally, the interpretive analysis was limited if there was a need to go beyond understanding to action. Methods that might help with this could be CSH, soft systems methodology (Checkland and Scholes 1990), or strategic choice approach (Friend and Hickling 1987).

EXAMPLE 3—DESIGN OF AN IS/IT STRATEGY. The third example is different from the previous ones in being action research in which the researcher was engaged in designing an IS/IT strategy. Ormerod (1995) was commissioned to assist Sainsbury's (one of the U.K.'s foremost retail chains) in "producing an IT strategy that fits Sainsbury's, based on a shared understanding to generate commitment at Board level." The emphasis was on creativity, learning, and

broadmindedness. It was to be highly participative involving many senior managers. The overall approach revolved around the participation of different groups in a process of seminars, workshops, and project work. Ormerod organized the project into five sequential stages and used various methods and techniques at different points.

The phases were: (1) *Involvement*. This was the initial planning of the project, designing task groups, and ensuring the participation of relevant actors. (2) *Business imperatives*. The first substantive stage was to generate understanding and agreement about the business and its environment and the crucial business imperatives. The main tool was cognitive mapping. Maps were developed for several key actors, and these were discussed, elaborated, and eventually combined into a map of the overall business. Other techniques used were SWOT analysis (strengths, weaknesses, opportunities, threats), de Bono's "six thinking hats" (1985), Mintzberg's structure in fives model (1983), and Porter's value chain (1985). (3) *Insight into future systems*. This stage was concerned with exploring various areas of the business to identify potential new systems developments. Seven teams covered different areas using SSM (Checkland and Holwell 1998). This involved developing rich pictures of the area, creating models of possible systems, and evaluating their desirability and feasibility. (4) *Evaluation*. This phase considered all the candidate systems (100) in terms of their costs and benefits relative to the business imperatives identified in Phase 2. Then followed "comparing" and "choosing" stages of the Strategic Choice approach. Quantitative and qualitative measures were used in the evaluations, and the Viable Systems Model (Beer 1985) was also employed, although not very successfully. (5) *Strategic initiatives*. Finally, the portfolio of possibilities was shaped into a strategic plan of six interlinked initiatives, each with several subprojects. This formed the basis of IT strategy over the medium term. Unusually, Ormerod (1996b) returned five years after the project to evaluate how the strategy had performed on implementation.

Evaluating this research, it is clearly a sophisticated example of multimethodology, wherein a range of methods and parts of methodologies were combined

together to meet the needs of the particular situation. In terms of the research methods used, it did cover all the stages of a research design (§4.1.2), but in the main it concentrated on the use of soft methods in the personal dimension. There was little quantitative analysis except in the final evaluation stages and little by way of consideration of the social and political aspects of the process except in the emphasis on widespread participation, at least among senior managers.

In terms of the research context (§4.1.1), action research raises delicate questions concerning the relationship between client and researcher, some of which are explored by Ormerod in a later paper (Ormerod 1996a). If the researcher is being employed as a consultant to achieve a particular outcome for the client, then this will be the dominant factor in determining what the researcher actually does. This must inevitably condition the results and imply a strongly managerialist perspective. Critical inquiries or methods that challenge the existing balance of power or accepted practices too radically may well not be acceptable (Mingers 2000c). Equally, it is likely that management will set the scope and boundaries of the project and perhaps impose particular solutions, e.g., downsizing. There could also be problems within the research side. To count as genuine research there should be some theory or method which is to be tested that is made explicit at the start of the project. The reflective results need to be published. However, it is often the case that in the heat of action pragmatic decisions are made, and the original ideas to be tested are abandoned. There are also often problems in publishing the results for confidentiality reasons.

5. Conclusions

This paper has argued for the adoption of a pluralist approach within IS research. This means that in designing the methodology^s for any research study consideration should be given to the different dimensions of a real situation, material, social, and personal; to the tasks involved in the different stages of a research study; and to the research context (including the capabilities and characteristics) of the researcher(s). This should lead, if possible and appropriate, to the con-

struction of a multimethod, multiparadigm research design. The paper went on to discuss a variety of feasibility issues that are (surmountable) barriers to multimethod research. Finally, some tools were described that can be useful in multimethod research, and these were illustrated by a critical discussion of three pieces of empirical research.

Out of this discussion, we can now outline an agenda for further work. First, more research needs to be done on the cognitive and cultural obstacles that stand in the way of multimethod research. Are there other personality-related factors that impinge upon research preferences, in addition to those identified in the Jungian schema? Can individuals operate effectively in nonpreferred research modes? What are the preferences and "habits of mind" of information systems people? What scope is there, if any, for "paradigm shifting?" To what extent does the prevailing cultural constitution of the IS community mitigate against multimethod research? Should there be changes in the curriculum in tertiary education (Work 1997) and training to better develop multimethod competencies? All of these questions provide fertile avenues for further research.

Second, alternative theoretical frameworks to provide practical guidance for multimethod design need to be investigated. The two-dimensional framework presented here only illustrates one possibility. Inevitably, there will be others that are potentially valuable sources of insight. Once frameworks are in place, we can then set about the task of investigating logical possibilities for combining methods, putting them to work, and then reflecting upon the results. Third, there is the question of the individual researcher. The cognitive and psychological characteristics of individuals are important in making a particular selection of methodologies, but they are generally ignored in the development of methodologies and frameworks. Lastly, it is already apparent that a good deal of multimethod research is already being undertaken that has not yet filtered through into the literature. It would be useful to know more about this work. The answers to questions like: Who is doing it?; for what reasons?; and how are they combining methods?, would complement the insights that emerge out of more theoretically driven concerns such as those expressed here.

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