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Combining IS Research Methods: Variety Is (Not) the Spice of Life

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Abstract

This research in progress paper reports the results of a survey of the main IS journals to discover the extent of research that uses multiple methods. The preliminary results show that such multimethod research is rare, and where it does occur generally consists only of a survey combined with interviews/case studies. A more detailed discussion of the methodology and results will be available at the conference.

Introduction

The question of which research method(s) are most appropriate for information systems research has been a focus of concern for some time. Orlikowski (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 non-positivist (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) which found that 16% of papers used a broadly interpretive methodology. Thus the discipline of IS is in a position similar to other management disciplines such as management science and organizational studies that are also characterized by a plurality of research paradigms, each with particular research methods.

Mingers (2001) has argued that different research methods (especially from different paradigms) focus on different aspects of reality and that, therefore, a richer understanding of a research topic will be gained by combining several methods together in a single piece of research or research program.[1] This position has been supported by a number of authors (Galliers, 1991; Galliers, 1993; Galliers, 1994; Landry and Banville, 1992; Lee, 1991) and as long ago as 1985, Lyytinen and Klein (1985) argued that the hermeneutic and empirical analytic traditions should be brought together.

The current research is an investigation of the IS literature in order to determine the extent to which different research methods are actually combined together in practice, and whether there were particular combinations that worked well together. This study complements one carried out to discover the extent of multi-method interventions in practical applications of Operational Research (Munro and Mingers, 2000). Analysis of the results has not yet been completed (the data below only goes up to 1997) but will be by the time of the conference.

How Common is Multi-Method Research?

To answer this question, an empirical review of the main IS journals was carried out specifically to evaluate the extent of multi-method research. This study complements similar reviews by Walsham (1995) and Nandhakumar and Jones (1997) into the prevalence of interpretive research.

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[1]This approach is called "multimethodology" by Mingers and Gill Mingers, J. and Gill, A., Eds. *Multimethodology: Theory and Practice of Combining Management Science Methodologies*. Wiley, Chichester, 1997.

Six journals were selected - *MIS Quarterly*, *Information Systems Research* as the leading (and American) journals, *Information Systems Journal, J. of Information Technology* and *European Journal of IS* as European ones, and *Accounting, Management and IT* as a more eclectic one that would potentially be favorable to multimethod research. All papers between 1993 and 2000 were surveyed to record:

i) if there was empirical research (as opposed to theory, methodology, literature review);
ii) the particular method(s) used;
iii) the occurrence of multiple methods.

Table 1. Frequency of Use of Research Methods 1993-2000 (AMIT covered only 1995-2000)

	ISR	ISJ	MISQ	EJIS	AMIT	JIT	Mean
Observation	25%	12%	12%	5%	11%	8%	12%
Survey	19%	18%	28%	35%	10%	24%	24%
Experiment	26%	10%	16%	6%	8%	1%	11%
Simulation	5%	0%	0%	0%	3%	1%	1%
Case study	15%	27%	18%	31%	24%	41%	27%
Interview	7%	13%	14%	10%	15%	10%	11%
Content analysis	0%	2%	1%	0%	3%	2%	1%
Ethnography	0%	5%	2%	0%	7%	5%	3%
Grounded theory	1%	2%	1%	1%	3%	1%	1%
Participant observation	0%	0%	0%	1%	7%	1%	1%
Action research	0%	9%	1%	2%	4%	3%	3%
Critical theory	0%	0%	1%	0%	0%	1%	0%
Consultancy	1%	0%	4%	7%	1%	0%	2%
Other	1%	1%	2%	2%	4%	3%	

We shall look first at the relative usage of different methods and how this compares with previous studies. Table 1 shows, for each journal, the proportion of each type of research method used. Where a paper uses multiple methods each one is counted. Thus, for ISR there were actually 98 empirical papers (out of a total of 149) which generated 115 uses of a method. Of these 115, 25% were observation (usually combined with statistical analysis), 19% were surveys and 26% were experiments. Looking at the means, we can see that observation, surveys and case studies accounted for 63% of all instances. When experiments and interviews are included this rises to 85%. Thus only 15% of instances used "non-traditional" research methods. Of the non-traditional methods, ethnography (including hermeneutics), action research and consultancy were most common. Considering the journals, ISR is strong on observation and experiment, ISJ on case studies, MISQ on surveys, and EJIS and JIT on surveys and case studies. AMIT is clearly different in having a much higher proportion of qualitative methods.

Some comparison with previous surveys can be made. Both Orlikowski and Baroudi (1991) and Nandhakumar and Jones (1997) classified research methods and their underlying paradigms. A detailed comparison at the level of methods is difficult since all three studies have somewhat different sets and definitions of methods but at an aggregate level, O-B found observations, surveys and cases accounted for 67%, rising to 97% when including experiments and interviews, and N-J had 46% and 93%. Taken with ours, these do show some increase in the use of non-traditional methods over time.

Table 2 shows the frequency of empirical and multimethod research by journal across years. For each journal and year the columns show the total number of papers (excluding editorials, reviews etc.), the proportion judged to be empirical, and the proportion of these that were multimethod. Looking first at the means, the proportion of empirical papers is generally about two thirds with ISJ and particularly AMIT being considerable less. We can also see from Figure that is has been a rising trend starting from quite a low base of 47%.

I would suggest that this is a relatively high proportion of empirical material with a corresponding paucity of theoretical and philosophical work. For comparison, there is an analysis of the OR/MS literature in the US (Reisman and Kirschnik, 1994) and the UK/Europe (Ormerod and Kiossis, 1997). This compared journals in 1962 and 1992 in terms of the space devoted to meta research and philosophy, theory, and actual applications (equivalent to empirical research). The findings were: US, 1992 – 68% philosophy and theory, 32% applications; UK: 86% and 14%; and Europe 97% and 3%. Interestingly the relative lack of real applications was seen as a cause for concern. We might speculate that in IS it is relatively easier to undertake and have published some form of empirical study rather than a piece of serious theoretical work. It is also the case that the journals surveyed here tend

to be in the information management area rather than the more technical side of IS development and it would be interesting to look at this literature to see how much theoretical work there is there.

Table 2. Proportion of Empirical and Multimethod Papers, 1993-2000

	ISR			ISJ			MISQ			EJIS			AMI			JIT			Mean	Mean
Year	**Tot**	**Emp %**	**MM %**	**Tot**	**Emp %**	**MM %**	**Tot**	**Emp %**	**MM %**	**Tot**	**Emp %**	**MM %**	**Tot**	**Emp %**	**MM %**	**Tot**	**Emp %**	**MM %**	**Emp %**	**MM %**
93	13	38	40	15	13	0	26	54	50	25	56	0				26	54	21	47	23
94	17	47	13	15	67	20	24	71	35	25	56	29				19	42	13	57	23
95	16	69	0	16	56	11	26	54	7	21	52	18	13	69	33	22	55	8	58	12
96	27	67	28	16	44	14	21	52	18	23	57	15	16	31	60	30	60	0	54	20
97	21	81	18	17	88	27	25	64	19	23	65	7	10	80	63	23	78	17	75	21
98	17	82	0	16	38	0	21	71	20	19	89	18	13	62	25	23	83	16	72	13
99	20	75	0	16	56	22	25	68	24	24	79	21	11	82	56	32	91	21	77	21
00	18	56	10	16	81	31	18	89	13	10	60	0	11	55	33	21	86	33	73	21
Mean		66	12		56	20		65	23		64	15		61	44		61	17		

Tot: total number of papers (AMIT only covered from 1995).
Emp: proportion of total that were empirical.
MM: proportion *of empirical* that were multimethod.
Note that the mean figures are not calculated from the columns but from the actual numbers of papers.

Moving to the substantive question of multimethod research, the mean proportion varies from 12% in ISR to 44% in AMIT although the latter is somewhat of an outlier. The average across journals varies rather randomly over time at around the 20% level.[2] Thus, in the main journals only one in five papers make use of multiple research methods, and this has not increased over time despite strong support for this approach, especially in the early 1990s (Galliers, 1991; Galliers, 1993; Galliers, 1994; Landry and Banville, 1992; Lee, 1991; Lyytinen and Klein, 1985; Robey, 1996; Smithson, 1991). Possible reasons for this will be discussed later.

We can also look at the particular combinations of methods used. Taking them in pairs (there were very few examples of more than two methods used), we find that the vast majority (70%) involve only observation, survey, case study and interview as shown in Table 3:

Table 3. Most Common Combinations of Methods (freq. of occurrence)

	observation	**survey**	**case**
survey	5		
case	9	22	
interview	19	34	21

Virtually no other combinations have more than one or two instances thus confirming the very narrow range of research methods used in contrast to the wide diversity that is sometimes claimed (Benbasat and Weber, 1996; Robey, 1996).

How Feasible is Multi-Method Research?

Having put forward arguments for the desirability of multi-method 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 different levels of problems can be identified:

i) *philosophical* - particularly the issue of paradigm incommensurability;

[2]This is larger from the initial figure reported in Mingers Mingers, J. "Combining information systems research methods: towards a pluralist methodology," *Information Systems Research* (12:2), 2001, pp. in press.. This results from a change of journal base – JIT for CACM – and incorporating more years.

ii) *cultural* - the extent to which organizational and academic cultures militate against multi- method work;
iii) *psychological* - the problems of individual researchers who are often only comfortable and competent with a particular type of method;
iv) *practical* – the extent to which factors such as research grants and tenure militate against innovative and perhaps more complex research designs.

Each of these is a major research area in its own right that can only be mentioned in this paper. More detailed discussion will be found in Mingers and Gill (1997).

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