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Case Research in IS: State of Affairs

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CASE RESEARCH IN IS: STATE OF AFFAIRS

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ABSTRACT: Case studies are an important research method in areas where innovations are studied such as in the field of IS. This method enables us to study contemporary phenomena in their natural context.

Ten years ago, Benbasat, Goldstein & Mead presented an instrument for the evaluation of case studies, and applied this to case studies in IS. They came to the conclusion that many researchers seem to ignore important methodological issues.

We questioned the current state of affairs and investigated 55 case studies that were published in the last two years. We did the same evaluation as Benbasat, et al., although we took into consideration the difference between positivistic and interpretive studies in our review. We conclude that although progress has been made, there is still a need for improvement. Therefore, we propose that case investigators make the chain of evidence explicit, so that the audience is able to follow the relations between theory, units of analysis, site selection, sources of evidence, data analysis techniques, data and conclusions. We ask for more attention for the publication of case study designs to further professionalize the application of this research method in our field of research.

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1. Introduction

In 1987 Benbasat, Goldstein & Mead proposed several criteria for the evaluation of case research. They applied these criteria to a set of case studies and stated:

"...we identified a number of problems....Some of these might be alleviated by asking the authors to provide more information about their research objectives and research plans. However, it appears to us that, in many instances, the investigators had not considered some of the methodological issues".

As case studies are an important research method in IS, we asked ourselves the question: what is the state of affairs ten years later? We start this paper with an evaluation of the criteria used by Benbasat, et al. considering the literature on case studies published in the last decade. Following, we present our research method and the results of our study. We end our paper with a discussion of the results, some conclusions and some recommendations.

2. Literature

Benbasat, et al. (1987) used the following criteria in their evaluation.

1. The research *themes*. The investigator must confirm that the research theme is applicable to case research. This is especially the case when:
 - the phenomenon of interest cannot be studied outside its natural setting,
 - the study focuses on contemporary events,
 - the researcher has no control over subjects or events,
 - the phenomenon under analysis doesn't enjoy an established theoretical base.
2. The research *objectives*. The investigator must explicitly show what role the study plays in the knowledge building process (exploration or explanation).
3. *The unit of analysis and site selection*. This serves to make the research topic explicit and sets the domain for which the conclusions are valid. Furthermore it indicates the degree to which the theory has undergone falsification.
4. *Data collection method*. This relates particularly to the use of multiple sources of evidence to make triangulation possible.

Benbasat, et al. (1987) surveyed four journals and the proceedings of the ICIS conference over the period of January 1981 to December 1985. Their main *conclusions* were:

- In general, the objectives of the studies were not clearly specified.
- In general, the motives for selecting a single case study or a multiple case study were not explained and the choice of sites was not tied to the design approach. The amount of cases varied from one to nine.

- In many cases, the data collection method was ambiguous and details were not provided.
- The researchers rarely used triangulation to increase the reliability of the study.
- The amount of case studies listed in the journals varied from one per year to 25% of all articles.

Since 1987 several papers has been devoted to case research methodology in information systems and related areas of research. At least two issues has been discussed which place the work of Benbasat et al. in a different perspective: the *epistemological* debate (positivism versus interpretivism) and the work published on *qualitative data analysis techniques*.

Benbasat et al. don't make their *epistemological* orientation explicit in their paper, but their perspective on the knowledge accrual process is positivistic. They see this process in a typical positivist way as having three phases: description, hypothesis generation and hypothesis testing. They state for instance: "*It is incumbent upon the scientist to formalize this knowledge -of practitioners- and proceed to a testing stage*". Positivist belief that the world conforms to laws of causation which could be objectively tested. Their research approach is hypothetico-deductive and confirmatory (Fitzgerald & Howcroft, 1998; Lacity & Janson, 1994; Orlikowski & Baroudi, 1991). Interpretists belief that multiple realities exist as subjective constructions of the mind. They see the world as socially constructed. Their research approach is inductive and concerned with discovering and interpreting social patterns. Their main objective isn't to arrive at testable hypothesis nor to test hypothesis. (Fitzgerald & Howcroft, 1998; Gummesson, 1991; Lacity & Janson, 1994; Orlikowski & Baroudi, 1991). As both perspectives are incommensurable (Fitzgerald & Howcroft, 1998; Lee, 1994) differentiation in criteria applied to both perspectives should be taken care of (Gummesson, 1991).

For the *data analysis* phase Benbasat et al. see the establishment of a chain of evidence and triangulation between data sources (data triangulation) or among different evaluators (investigator triangulation) as the main criteria. As methods of qualitative data analysis are not well formulated, few conventions and guidelines are in use, we still lack a bank of explicit methods to draw on (Miles & Huberman, 1994) and many researchers seem to be unfamiliar with it (Lacity & Janson, 1994), we might learn more about qualitative data analysis by informing each other about applied techniques. Miles and Huberman (1994) emphasize on text analysis, coding and data displaying: "*you know what you display*". Lacity and Janson (1994) provide us with an overview of positivistic (content analysis, verbal protocol analysis, script analysis), linguistic (speech act analysis; discourse analysis) and interpretive (hermeneutics, intentional analysis) data analysis approaches.

3. Research method

The *objective* of our study is to contribute to the understanding of how to apply case studies in IS research. We asked ourselves the *question*: do case studies published in the last two years, more adequately meet up to the criteria employed by Benbasat, et al.?

To be able to compare with ten years ago we use the same definitions and criteria as Benbasat, et al. Our orientation is *positivistic*. We expect the majority of case studies to be part of the positivist tradition in IS research (Kaplan & Duchon, 1988; Orlikowski & Baroudi, 1991). We took into account the difference between positivism and interpretivism by attempting not to apply positivist criteria to interpretive studies. Furthermore we took into account the need for more information about the application of qualitative data analysis techniques.

Our main *criteria* is explicitness. We follow Shipman (1982) in that scientists can be distinguished from others on the following ground: their methods and research procedures are made public. We examined the non-interpretive papers on the following *issues*.

- The *applicability* of case research to the research theme and the researcher's *motive* for conducting case research.
- Whether *exploration* or *explanation* was the objective. Exploration is seen as the description and theory generation phase of the knowledge generation process whereas explanation is seen as the phase of hypotheses testing (Benbasat, et al., 1987; Yin, 1994). The case study is an accepted strategy for both objectives (Benbasat, et al., 1987; Miles & Huberman, 1994; Yin, 1994).
- The *amount* of cases, the *unit of analysis*, the *site selection criteria* and *replication logic*. These issues contribute to the clarity of generalization (Yin, 1994). In single exploratory cases the unit of analysis and site selection criteria inform us about the appropriateness of the case in light of the research problem.
- The *sources of data*, *triangulation* and the establishment of a formal *review process*, *case study database* and *protocol*. Triangulation increases construct validity (Yin, 1994). The reliability of case studies can be increased by using review procedures, a case study database and a case study protocol (Yin, 1994).

We extended the criteria of Benbasat et al. with two other issues.

- Whether the *epistemological orientation* of the study is made explicit. Researchers should present their paradigm to inform the reader about how to review the paper (Gummesson, 1991).
- Whether *data collection techniques* are made explicit. We emphasize on coding and displaying (Miles & Huberman, 1994) and on the text analysis techniques provided by Lacity and Janson (1994).

The explicitation of these issues in the case study design, a case study protocol and the case study database enables the consumer of the research to follow the derivation of any evidence from initial research questions to conclusions (the *chain of evidence*) and to draw his own conclusions (Gummesson, 1991; Yin, 1994). It adds to the credibility of the research (Shipman, 1982).

For *interpretive studies* we only *reviewed* whether the unit of analysis, the site selection criteria, sources of data, triangulation and data analysis techniques were mentioned explicitly. We believe that these criteria apply to interpretive studies because it informs us about the research object on which

local theories are build (Gummesson, 1991) and about how data is collected, analyzed and interpreted to arrive at these local theories.

We reviewed 55 research papers published in the two most recent (1996 and 1997) and complete publication issues of the following seven journals and one conference proceedings.

- Management Information Systems Quarterly (MISQ) (1996: vol. 20, no. 1-4; 1997: vol. 21, no. 1-4);
- Information Systems Research (ISR) (1996: vol. 7, no. 1-4; 1997: vol. 8, no. 1-4);
- Communications of the ACM (CACM) (1996: vol. 39, no. 1-12; 1997: vol. 40, no. 1-12);
- Journal of Management Information Systems (JMIS) (1996: vol. 12, no. 3-4, vol 13, no. 1-2; 1997: vol. 13, no. 3-4, vol. 14, no. 1-2);
- Information & Management (I&M) (1996: vol. 30, no. 1-6, vol. 31, no. 1-4; 1997: vol. 31, no. 5-6, vol. 32, no. 1-6, vol. 33, no. 1-2);
- Journal of Strategic Information Systems (JSIS) (1996: vol. 5, no. 1-4; 1997: vol. 6, no. 1-3);
- The International Journal of Information Management (IJIM) (1996: vol. 16, no. 1-6; 1997: vol. 17, no. 1-6);
- The Proceedings of the 17th and 18th Annual, International Conference on Information Systems (ICIS) (1996: vol. 17; 1997: vol. 18).

The first four journals belong to the top five in a rating of 53 journals according to their appropriateness as publication outlets. This rating is the outcome of a study under MIS faculty in the US and Canada by Hardgrave & Walstrom (1997). We didn't include the fifth journal out of this top five (Management Science) in our study because it isn't a "pure" MIS journal (Hardgrave & Walstrom, 1997). The same holds true for CACM as it is seen as a computer science journal (Hardgrave & Walstrom, 1997) but we included this one in our study because of its inclusion in the study of Benbasat, et al. They also included MISQ (first in rating), ICIS (first in conference rating) and I&M (20th in the rating). Therefore, we included these in our study. We enhanced the list with the JSIS (25th in the rating) to have two journals with an average rating included and completed the list with one journal which was not part of the rating: IJIM.

Our intend was not to take a representative sample but rather to get a general overview by reviewing papers from journals with different ratings. We followed a *replication logic*, not a sampling logic (Yin, 1994). Papers were enclosed in our review when the authors explicitly mentioned to have applied the case study method. We excluded action research studies and application descriptions from our sample like Benbasat et al. did. Although related, we view these as different research methods (Benbasat et al., 1987; Gummesson, 1991).

For *data analysis* we used content analysis, a specific method of text analysis (Lacity and Janson, 1994) and we constructed several conceptually ordered displays (Miles & Huberman, 1994), like table one and two. We applied investigator triangulation (Yin, 1994). Both authors independently reviewed,

analyzed and coded the papers. In our description we refer to examples of nice practice to facilitate other researchers in their case study design.

4. Results

The journals contained 623 articles (365, excluding CACM). We categorized 55 studies as case studies. This amounts to 9% (15% excluding CACM) of all publications. The percentages in the journals are:

- JSIS: 31%;
- ICIS proceedings: 19%;
- MISQ: 18%;
- JMIS: 16%;
- IJIM: 15%;
- ISR: 9%;
- I&M: 7%;
- CACM: 1%.

4.1 Epistemological orientation

In nine studies the researchers explicitly stated an interpretive orientation. Butler & Fitzgerald (1997) are quite specific, their study is grounded within a constructivist paradigm and the dialectical hermeneutical approach. The review of the interpretive studies is summarized in table 1. In all these studies the cases and their contextual conditions were described quite detailed and the researchers motivated why they conducted a case study.

Table 1. Review of interpretive studies

<i>Authors</i>	<i>Theme</i>	<i>Cases</i>	<i>Site selection Criteria</i>	<i>Unit of Analysis</i>	<i>Data sources</i>	<i>Data analysis technique</i>	<i>Triangulation</i>
Butler & Fitzgerald	User participation (L)	2	No	System development projects	IV, Docu	Hermeneutics	No
Currie & Willcocks	BPR (L)	1	No	Project*	IV, Docu, IS	No	No
Jarvenpaa & Leidner	Resource-based view	1	No	Organization	IV, Docu, Email	Code-theme based**	No
Lacity, Willcocks & Subramanian	Client/server implementation (L)	1	Yes	Project	IV, Docu	Double hermeneutics	Data Investigator
Larsen & Myers	BPR	1	No	Project	IV, Docu	Hermeneutics	No
Nidumolu, Goodman, Vogel & Danowitz	IT implementation	13	Yes	Project*	IV, Docu	No	Investigator
Robey & Sahay	IS implementation	2	Yes	Project	IV, Docu	Code-theme based	No
Shanks	Strategic data planning	1	Yes	Group	IV, Docu, Survey	Structuration theory***	Data
Wareham, Bjørn-Andersen & Neergaard	IT and empowerment	1	No	Project*	IV	No	No

Abbreviations: IV=interview, docu = documentation

*) Not explicitly

**) Text is coded based on themes and themes are grouped

***) Concepts from structuration theory are used in the case study analysis

(L) Logitudinal case study

In two studies a positivistic orientation is explicitly stated (Johnston & Yetton, 1996; Sharma & Yetton, 1996). Guha et al. (1997) state that they analyzed their data in a positivist tradition. Analysis of the structure and reasoning of all other papers gives ground to the assumption that they all fall under the traditional positivistic orientation of IS research. The rest of the description of results is about the remaining 46 non-interpretive studies. These are outlined in table 2.

4.2 Research themes and objectives

The research *themes* of the studies lend themselves to case research. In 40% of all papers the authors motivate why they deem case research as being a *suitable methodology* for their research (e.g. Sharma & Yetton, 1996).

Almost three quarters of all studies are classified as *exploratory*. In most explorative studies the case is analysed by using a theoretical framework and conclusions are reached regarding the workability of the framework. Explorative studies are seldom used to *generate testable hypotheses*. The Bennett & Weill (1997) study is an exception. Almost 15% of the studies are *hybrids* of exploratory and explanatory (e.g. Kirsch, 1997). The remaining 15% of case studies are *explanatory*. Explicitly stated *hypotheses are tested* in three explanatory studies (Agarwal & Tannuri, 1996; Clark & Stoddard, 1996; Lee & Kim, 1997) and 2 hybrids (Brown, 1997; Broadbent et al., 1996).

In fourteen studies the *research questions* are explicitly stated (Agarwal & Tanniru, 1996; Bennett & Weill, 1997; Brown, 1997; Clark et al., 1997; Clark & Stoddard, 1996; Ewusi-Mensah, 1997; Fuller-Love & Cooper, 1996; Guha et al., 1997; Kirsch, 1997; Kunnathur et al., 1996; Newman & Sabherwal, 1996; Orna, 1996; Sia & Neo, 1997; Smits, Van der Poel & Ribbers, 1997). Only one paper places the study within a *research program* (Henderson & Lentz, 1996).

Table 2. Review of non-interpretive studies

Authors	Theme	O/A	Cases	Site selection criteria	Unit of Analysis	Data Source	Data analysis technique	Triangulation
Agarwal & Tanniru	BPR	A	1	No	Organization*	IV	No	No
Ang, Thong & Yap	Implementation and organizational learning	A	1	No	3 Systems**	IV, Docu, Observ, IS	No	Data
Aubert, Rivard & Patry	IS outsourcing	A	10	Yes	Organization*	IV, Docu	Classification based on variables	No
Belmiro, Gardiner & Simmons	BPR	O	6	No	Project*	IV, Survey	No	No
Bennett & Weill	Electronic messaging infrastructure	O	1	No	12 Projects**	IV, Docu	No	No
Broadbent, Weill, O'Brien & Neo	IT infrastructure	Hy	26	Yes	Organization*	IV, Docu, Survey	Qualitative, Quantitative	Data
Brown	IS governance	Hy	1	Yes	4 Business units**	IV, Docu, Survey,	Pattern matching, Explanation building	Data
Bytheway & Dhillon	interorganizational systems	O	2	No	Partnership*	No	No	No
Chatfield & Bjørn-Andersen	IOS-BPR	O	1	No	Project*	IV, Docu, Archi	No	No
Clark, Cavanaugh, Brown & Sambamurthy	Change readiness	O	1	No	Project	IV, Docu, Survey	No	No
Clark & Stoddard	BPR	A	4	Yes	Organization	IV, Survey	Qualitative, Quantitative	No
Clemons, Croson & Weber	Strategies of market leaders and new entrants	O	4	No	Markets*	'Off the shelf' cases	No	No
Cross, Earl & Sampler	Transformation of IT organization (L)	O	1	Yes	IT-organization	IV, docu	No	No
Dhillon & Backhouse	Risks in IT use	O	2	No	Organization	IV, Docu	No	No
Eisley & Tang	BPR	O	1	Yes	30 Organizations**	IV, Docu	No	No
Ewusi-Mensah	IS project failure	O	2	No	Project*	Cases out of literature combined with survey	No	No
Ferratt, Lederer, Hall & Krella	Cooperation or competition through the use of IT	O	1	No	Project	IV, Docu, Observ	No	No
Flor & Maglio	Electronic commerce	O	1	Yes	Organization*	IV, Docu, Observ	No	No
Fuller-Love & Cooper	Strategic IS planning	O	1	No	4 Project s**	IV, Docu	No	No
George	Computer-based monitoring	O	5	No	Organization*	IV, Docu, Survey	No	No
Guha, Grover, Kettinger & Teng	BPR	O	3	Yes	Organization, group, project**	IV, Docu, Survey	Pattern matching, Explanation building	Data
Henderson & Lentz	Innovation, learning and working	O	6***	No	Business unit*	IV, Docu, Survey	No	No
Johnston & Yetton	IT departments in a merger	O	1	Yes	IT organization	IV, Docu	No	No
Kirsch	IS project management	Hy	4	Yes	Project	IV, Docu,	Coding, Displaying	Data
Kunnathur, Ahmed & Charles	Expert systems adoption	O	6	Yes	Project*	IV	No	No

Lee & Clark	BPR through electronic markets	O	4	Yes	Organization*	Cases out of literature	No	No
Lee & Kim	IS outsourcing	A	11	No	Organization*	IV, Docu, Surv	No	No
Li	Organizational redesign through ICT	O	22	No	Organization*	IV, Docu	No	No
Lucas, Berndt & Truman	BPR	O	1	No	Project*	IV	No	No
Massetti & Zmud	EDI	O	7	Yes	Business unit	IV, Docu	No	No
Newman & Sabherwal	IS development (L)	O	1	No	Project	IV, Docu, Observ	Double Hermeneutics*****	Investigator
Orna	Information products	O	9	No	Organization*	IV	No	No
Peters & Jarke	Information flows in networked organizations	O	1	No	Organization*	IV	No	No
Pliskin & Romm	Virtual community	O	1	No	Virtual community	E-mail	Content analysis (incl. coding)	No
Reich & Benbasat	Linkage between business and IT objectives	Hy	10	No	Business unit	IV, Docu	Qualitative, Quantitative****	Data, Investigator
Romm, Pliskin & Rifkin	Exploiting e-mail for political manipulation	O	1	No	Group	IV, Docu, Survey, E-mail	No	No
Sauer, Southon & Dampney	Implementation project failure	O	1	No	Project	IV, Docu,	Displaying, Explanation building	Data, Investigator
Sharma & Yetton	Interorganizational cooperation in IS development	Hy	3	Yes	Consortia	IV, Docu	No	No
Sheppard & Bawden	Information provision by television and newspaper	O	2	No	News theme	Newspapers and television	Content analysis	No
Sia & Neo	BPR	O	1	No	Organization*	IV, Docu, Archi	Coding	Investigator
Sillince & Mouakket	Politics in IS development (L)	A	1	No	Project	IV, Docu, Observ	No	Data
Smits & Van der Poel	Information strategy	Hy	6	Yes	Organization*	IV, Docu	Measurement on ordinal and nominal scales	No
Smits, Van der Poel & Ribbers	Information strategy	O	3	Yes	Organization*	IV, Docu	No	No
Stein & Vandenbosch	Organizational learning and IS development	O	3	No	Organization	No	No	No
Teo, Tan & Wei	Organizational transformation and EDI	O	1	No	Organization and partners*	IV, Docu, Survey, Observ	Qualitative, Quantitative*****	Data, Investigator
Zack	Electronic publishing	O	1	No	Project*	IV, Docu, E-mail, IS	No	No

Abbreviations: A=Explnatory; O=Explratory; Hy=Hybrid; IV=interview, Docu=documentation; Observ=observation; Archi=Archival records; IS=Information Systems

No=not expressed explicitly / Yes=expressed explicitly

*) Not explicitly stated / interpretation of reviewers

**) Explicit embedded design

***) One case out of a study of 6 cases is presented

****) Relies mainly on qualitative data (displaying and quoting), but statistical analysis on the data is provided in addition.

*****) Quantitative: statistical analysis of survey and change point analysis of company performance figures

(L) Logitudinal case study

4.3 Unit of analysis and site selection criteria

In almost half of the studies the *units of analysis* are specified, for the other half the unit of analysis is determined by interpretation of the reviewers. In six papers an *embedded design* is explicitly mentioned (e.g. Guha, Grover, Kettinger & Teng, 1997).

The *site selection criteria* were described in one third of the papers. Yin (1994) proposes that a single case study can be especially suitable in the event of a '*critical*', '*unique*' or '*revelatory*' case. We found two instances of this: Ang, Thong & Yap (1997) and Brown (1997).

4.4 Data collection and analysis

Most case researchers describe their data collection method, except in five studies. Interviews and documentation are the most popular *sources of data*. In twelve studies *review procedures* are mentioned explicitly (e.g. Teo, Tan & Wei, 1997). Three researchers mention explicitly to have uses a *case study database* (Ang, Thong & Yap, 1997; Kirsch, 1997; Sia & Neo, 1997). Four researchers mentioned to have used a *case study protocol* (Ang, Thong & Yap, 1997; Brown, 1997; Guha et al., 1997; Kirsch, 1997).

In one third of all studies a *data analysis technique* has been specified. The overall picture is pluriform. In four studies qualitative and quantitative techniques are combined (e.g. Teo, Tan & Wei, 1997). Sometimes a multimethod approach is chosen (e.g. Clark & Stoddard, 1996).

In eleven studies the researchers stated explicitly that they used *triangulation*. In two exploratory studies the *replication logic* is mentioned explicitly (e.g. Bennett & Weill, 1997; Guha et al., 1997).

5. Discussion

Our analysis enables us to make three comparisons:

- Between the results of this study and those of Benbasat et al.
- Between the proposed criteria for a clear chain of evidence (Yin, 1994; Benbasat et al., 1987) and the application of those criteria in practice.
- Between interpretive studies and positivistic studies.

In comparison with the Benbasat, et al. study some progress has been made. Authors more often specify the position of the study in the process of knowledge accrual. From a positivistic standpoint the amount of case studies that actually had the objective of arriving at testable hypotheses or to test hypotheses is somewhat disappointing. The unit of analysis and the site selection criteria are more often stated than ten years ago. Most studies use multiple data sources during data collection, but still explicitly stating the usage of review procedures, a case study database or case study protocol is rare. The same holds for triangulation and stating the replication logic.

Improvements still have to be made in the design of an explicit chain of evidence. Units of analysis, site

selection criteria, review procedures, case study databases and protocols, data analysis techniques, triangulation and the applied replication logic are still too often not stated. On average, the chain of evidence was better established in the studies published in the top five journals of Hardgrave & Walstrom's (1997) rating and in the ICIS proceedings.

A comparison between positivist and interpretive studies indicate differences in stating the epistemological orientation and data analysis techniques. On making explicit the unit of analysis and site selection criteria we don't see a real difference. Stating explicitly *the epistemological orientation* is rarely the case in positivist studies but frequently the case in interpretive studies. It could be argued that there is more need for interpretists to stand their orientation because it differs from the traditional one. We don't agree. We expect more pluriformity in case research in the near future. Interpretism is becoming more widespread. Some scholars are trying to combine both orientations in their work (Lee, 1994) or argue for more pluralism (Kaplan & Duchon, 1988). Others suggest that we need to advance beyond the stage of dichotomy and call for an awareness of the strengths and weaknesses of both perspectives and accommodating them pluralistically in our overall research designs (Fitzgerald & Howcroft, 1998; Gummesson, 1991). Last but not least, taking a traditional orientation still asks for arguments to do so.

The *data analysis technique* is more often discussed and at greater length in the interpretive studies. The lack of attention for stating these techniques within most of the positivist studies is remarkable because in quantitative studies this is often discussed at great length. The overall picture of the application of data analysis techniques is quite pluriform which indicates that we still lack conventions and a bank of explicit methods to draw on (Miles & Huberman, 1994). This asks for providing more information and discussion about applied techniques.

6. Conclusions and recommendations

Although progress have been made, we must largely subscribe to the conclusions of Benbasat et al. Yet, it does not appear to be common practice in case research to make the entire chain of evidence explicit. Furthermore we need more insight in how qualitative data analysis techniques are applied in IS research and we expect case research to become more pluriform in the near future.

For these reasons we recommend the publication of more case study designs, especially in 'research in progress' tracks on conferences. Although we know that *'the proof of the pudding is in the eating, we ask for more attention to be paid to the recipe'*. Good research results are the best stimuli for good research designs, but publication of the research design could provide researchers with additional stimuli to establish a clear chain of evidence in advance of their field work or to think through how to proceed from data to explanations in inductive studies. This could eventually lead to conventions on practice in case research which would be beneficial for our field of research and would assist researchers in their research

design. We find this of great importance because many research themes in our field of research give rise to the application of the case study method.

7. References

- Agarwal, R., and Tanniru, M. (1996). Organizational receptivity to change and success in process reengineering. *Proceedings of the 17th Annual International Conference on Information Systems*, Cleveland, Ohio, 133-144.
- Ang, K. T.; Thong, J. Y. L.; and Yap, C. S. (1997). IT implementation through the lens of organizational learning: a case study of insurer, *Proceedings of the 18th Annual International Conference on Information Systems*, Atlanta, Georgia, 331-348.
- Aubert, B. A.; Rivard, S.; and Patry, M. (1996). A transaction cost approach to outsourcing behavior: Some empirical evidence, *Information & Management* (30), 51-64.
- Belmiro, T. R.; Gardiner, P. D.; and Simmons, J. E. L. (1997). Business Process Re-engineering - A Discredited Vocabulary?, *International Journal of Information Management* (17:1), 21-33.
- Benbasat, I.; Goldstein, D. K.; and Mead, M. (1987). The Case Research Strategy in Studies of Information Systems, *MIS Quarterly* (11:3), 369-386.
- Bennett, M., and Weill, P. (1997). Exploring the use of electronic messaging infrastructure: the case of a telecommunications firm, *Journal of Strategic Information Systems* (6), 7-34.
- Broadbent, M., Weill, P., O'Brien, T., and Neo, B. S. (1996). Firm context and patterns of IT infrastructure capability, *Proceedings of the 17th Annual International Conference on Information Systems*, Cleveland, Ohio. 174-194.
- Brown, C. V. (1997). Examining the Emergence of Hybrid IS Governance Solutions: Evidence from a Single Case Site, *Information Systems Research* (8:1), 69-94.
- Butler, T., and Fitzgerald, B. (1997). A case study of user participation in the information systems development process, *Proceedings of the 18th Annual International Conference on Information Systems*, Atlanta, Georgia, 411-426.
- Bytheway, A. J., and Dhillon, G. (1996). Significance of Partnerships in the Management of Interorganizational Systems, *International Journal of Information Management* (16:5), 369-380.
- Chatfield, A. T., and Bjørn-Andersen, N. (1997). The Impact of IOS-Enabled Business Process Change on Business Outcomes: Transformation of the Value Chain of Japan Airlines, *Journal of Management Information Systems* (14:1), 13-40.
- Clark, C. E., Cavanaugh, N. C., Brown, C. V., Sambamurthy and V. Building (1997). Change-Readiness Capabilities in the IS Organization: Insights From the Bell Atlantic Experience, *MIS Quarterly* (21:4), 425-455.

- Clark, T. H., and Stoddard, D. B. (1996). Interorganizational Business Process Redesign: Merging Technological and Process Innovation, *Journal of Management Information Systems* (13:2), 9-28.
- Clemons, E.; Croson, D. C.; and Weber, B. W. (1996). Market Dominance as a Precursor of a Firm's Failure: Emerging Technologies and the Competitive Advantage of New Entrants, *Journal of Management Information Systems* (13:2), 59-75.
- Cross, J.; Earl, M. J.; and Sampler, J. L. (1997). Transformation of the IT Function at British Petroleum, *MIS Quarterly* (21:4), 401-423.
- Currie, W. L., and Willcocks, L. (1996). The New Branch Columbus project at Royal Bank of Scotland: the implementation of large-scale business process re-engineering, *Journal of Strategic Information Systems* (5), 213-236.
- Dhillon, G., and Backhouse, J. (1996). Risks in the Use of Information Technology Within Organizations, *International Journal of Information Management* (16:1), 65-74.
- Eisley, N., and Tang, M. T. (1996). The Middle Path: Dealing with Transformation in Asia's Information Technology Competitiveness Experience, *International Journal of Information Management* (16:4), 253-276.
- Ewusi-Mensah, K. (1997). Critical Issues in Abandoned Information Systems Development Projects, *Communications of the ACM* (40:9), 74-80.
- Ferratt, T.W.; Lederer, A. L.; Hall, S. R.; and Krella, J. M. (1996). Swords and plowshares: Information technology for collaborative advantage, *Information & Management* (30), 131-142.
- Fitzgerald, B. and Howcroft, D. (1998), Towards dissolution of the IS research debate: from polarization to polarity, *Journal of Information Technology* (13), 313-326.
- Flor, N. V., and Maglio, P. P. (1997). A case study of representational activity at a customer-centered business, *Proceedings of the 18th Annual International Conference on Information Systems*, Atlanta, Georgia, 383-398.
- Fuller-Love, N., and Cooper, J. (1996). Competition or Co-operation? Strategic Information Management in the National Health Service: A Case Study of the Ceredigion NHS Trust, *International Journal of Information Management* (16:3), 219-232.
- George, J. F. (1996). Computer-Based Monitoring: Common Perceptions and Empirical Results, *MIS Quarterly* (20:4), 459-481.
- Guha, S.; Grover, V.; Kettinger, W. J.; and Teng, J. T. C. (1997). Business Process Change and Organizational Performance: Exploring an Antecedent Model, *Journal of Management Information Systems* (14:1), 119-154.
- Gummesson, E. (1991), *Qualitative Methods in Management Research*, Sage, London.
- Hardgrave, B. C., and Walstrom, K. A. (1997). Forums for MIS Scholars, *Communications of the ACM* (40:11), 119-124.

- Henderson, J. C., and Lentz, C. M. A. (1996). Learning, Working, and Innovation: A Case Study in the Insurance Industry, *Journal of Management Information Systems* (12:3), 43-64.
- Jarvenpaa, S. L., and Leidner, D. E. (1997). An information company in Mexico: extending the resource-based view of the firm, *Proceedings of the 18th Annual International Conference on Information Systems*, Atlanta, Georgia, 399-410.
- Johnston, K. D., and Yetton, P. W. (1996). Integrating information technology divisions in a bank merger. Fit, compatibility and models of change, *Journal of Strategic Information Systems* (5), 189-211.
- Kaplan, B. and D. Duchon (1988), Combining Qualitative and Quantitative Methods in Information Systems Research: A Case Study, *MIS Quarterly*, 571-585.
- Kirsch, L. J. (1997). Portfolios of Control Modes and IS Project Management, *Information Systems Research* (8:3), 215-239.
- Kunnathur, A. S.; Ahmed, M. U.; and Charles, R. J. S. (1996). Expert systems adoption: An analytical study of managerial issues and concerns, *Information & Management* (30), 15-25.
- Lacity, M.C. and Janson, M.A., (1994). Understanding Qualitative data: A framework of Text Analysis Methods, *Journal of Management Information Systems* (11:2), 137-155.
- Lacity, M. C.; Willcocks, L. P.; and Subramanian, A. (1997). A strategic client/server implementation: new technology, lessons from history, *Journal of Strategic Information Systems* (6), 95-128.
- Larsen, M. A., and Myers, M. D. (1997). BPR success or failure? A business process reengineering project in the financial services industry, *Proceedings of the 18th Annual International Conference on Information Systems*, Atlanta, Georgia, 367-382.
- Lee, A.S. (1994), Electronic Mail as a Medium for Rich Communication: An Empirical Investigation Using Hermeneutic Interpretation, *MIS Quarterly* 143-157.
- Lee, H. G., and Clark, T. H. (1996). Market Process Reengineering through Electronic Market Systems: Opportunities and Challenges, *Journal of Management Information Systems* (13:3), 113-136.
- Lee, J. N., and Kim, Y. G. (1997). Information systems outsourcing strategies for affiliated firms of the Korean conglomerate groups, *Journal of Strategic Information Systems* (6), 203-229.
- Li, F. (1997). From Compromise to Harmony: Organizational Re-design Through Information and Communication Technologies, *International Journal of Information Management* (17:6), 451-464.
- Lucas, Jr., H. C.; Berndt, D. J.; and Truman, G. (1996). A Reengineering Framework for Evaluating a Financial Imaging System, *Communications of the ACM* (39:5), 86-96.
- Massetti, B., and Zmud, R. W. (1996). Measuring the Extent of EDI Usage in Complex Organizations: Strategies and Illustrative Examples, *MIS Quarterly* (20:3), 331-345.
- Miles, M.B. & A.M. Huberman (1994), *Qualitative data analysis*, Thousand Oaks: Sage.
- Newman, M., and Sabherwal, R. (1996). Determinants of Commitment to Information Systems Development: A Longitudinal Investigation, *MIS Quarterly* (20:1), 23-54.

- Nidumolu, S. R.; Goodman, S. E.; Vogel, D. R.; and Danowitz, A. K. (1996). Information Technology for Local Administration Support: The Governorates Project in Egypt, *MIS Quarterly* (20:2), 197-224.
- Orlikowski, W.J. and Baroudi, J.J. (1991), Studying Information Technology in Organizations: Research Approaches and Assumptions, *Information Systems Research*, (4:2), 1-28.
- Orna, E. (1996). Information Products and Presentation in Organizations: Accident or Design?, *International Journal of Information Management* (16:5), 341-351.
- Peters, P., and Jarke, M. (1996). Simulating the impact of information flows in networked organizations, *Proceedings of the 17th Annual International Conference on Information Systems*, Cleveland, Ohio, 421-439.
- Pliskin, N., and Romm, C. T. (1997). The impact of e-mail on the evolution of a virtual community during a strike, *Information & Management* (32), 245-254.
- Reich, B. H., and Benbasat, I. (1996). Measuring the Linkage Between Business and Information Technology Objectives, *MIS Quarterly* (20:1), 55-81.
- Robey, D., and Sahay, S. (1996). Transforming Work Through Information Technology: A Comparative Case Study of Geographic Information Systems in County Government, *Information Systems Research* (7:1), 93-110.
- Romm, C. T.; Pliskin, N.; and Rifkin, W. D. (1996). Diffusion of E-mail: an organizational learning perspective, *Information & Management* (31), 37-46.
- Sauer, C.; Southon, G.; and Dampney, C. N. G. (1997). Fit, failure, and the house of horrors: toward a configurational theory of IS project failure, *Proceedings of the 18th Annual International Conference on Information Systems*, Atlanta, Georgia, 349-366.
- Shanks, G. (1997). The challenges of strategic data planning in practice: an interpretive case study, *Journal of Strategic Information Systems* (6), 69-90.
- Sharma, R., and Yetton, P. (1996). Interorganizational cooperation to develop information systems, *Proceedings of the 17th Annual International Conference on Information Systems*, Cleveland, Ohio, 122-132.
- Sheppard, E. D. and Bawden, D. (1997). More News, Less Knowledge? An Information Content Analysis of Television and Newspaper Coverage of the Gulf War, *International Journal of Information Management* (17:3), 211-227.
- Shipman, M. (1982), *The Limitations of Social Research*. London, Longman.
- Sia, S. K., and Neo, B. S. (1997). Reengineering Effectiveness and the Redesign of Organizational Control: A Case Study of the Inland Revenue Authority of Singapore, *Journal of Management Information Systems* (14:1), 69-92.
- Sillince, J. A. A., and Mouakket, S. (1997). Varieties of Political Process During Systems Development, *Information Systems Research* (8:4), 368-397.

- Smits, M. T., and Van der Poel, K. G. (1996). The practice of information strategy in six information intensive organizations in The Netherlands, *Journal of Strategic Information Systems* (5), 93-110.
- Smits, M. T.; Van der Poel, K. G.; and Ribbers, P. M. A. (1997). Assessment of information strategies in insurance companies in the Netherlands, *Journal of Strategic Information Systems* (6), 129-148.
- Stein, E. W., and Vandenbosch, B. (1996). Organizational Learning during Advanced System Development: Opportunities and Obstacles, *Journal of Management Information Systems* (13:2), 115-136.
- Teo, H. H.; Tan, B. C. Y.; and Wei, K. K. (1997). Organizational Transformation Using Electronic Data Interchange: The Case of TradeNet in Singapore, *Journal of Management Information Systems* (13:4), 139-165.
- Wareham, J.; Bjørn-Andersen, N.; and Neergaard, P. (1997). Reinterpreting the demise of hierarchy: a case study in IT, empowerment, and incomplete contracts, *Proceedings of the 18th Annual International Conference on Information Systems*, Atlanta, Georgia, 315-330.
- Yin, R. K. (1994). *Case study research: design en methods*, Sage Publications, Thousand Oaks.
- Zack, M. H. (1996). Electronic publishing: A product architecture perspective, *Information & Management* (31), 75-86.

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