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COMBINING THEORY-TESTING AND THEORY-BUILDING ANALYSES OF CASE STUDY DATA

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Abstract

This paper discusses the potential problems and benefits of combining theory-testing and theory-building analyses of qualitative case study data. The examination is conducted in two contexts; first, that of carrying out both analyses within the positivist paradigm, and secondly, in combining positivist theory-testing analysis with interpretive theory-building analysis. A research design is used to illustrate the discussion. Potential benefits can be classified under a better understanding of the phenomenon in question, an improved research process and quality, as well as individual and social benefits. Furthermore, the philosophical, cultural, psychological and practical problems stemming from this setting are discussed.

1 INTRODUCTION

The case study approach – referring to case study research whose objective is to conduct research - has been accepted in the IS field since the 1980's (Benbasat et al. 1987; Yin 1984). No standard definition of a case study exists (Benbasat et al. 1987) but, for example, Eisenhardt (1989) describes the case study approach as "-- *a research strategy which focuses on understanding the dynamics present within single settings.*" (p. 534) Yin (1984, p.23) defines case study as an empirical inquiry that "*investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.*" (See also Yin 2003.)

These characteristics make the case study approach suitable for many research problems within the information systems (IS) domain since, due to rapid technological development, the phenomena are contemporary in nature, and since the focus is frequently on the use of information systems in organizations, this presents a setting where the boundaries of the system and the organization cannot be clearly defined. Furthermore, with regard to defining IS case studies, for example the definition presented by Lee (Lee 1989, p. 34): "--*examination of a real-world MIS as it actually exists in its natural, real-world setting*" seems to be a derivative of that of Yin (Yin 1984).

Case study may be considered a methodology, or 'the case' may be considered an object of the study (e.g. Creswell 1998, Stake 1995). Consequently, the case study approach embraces several methodological possibilities. The proponents of the first approach provide guidelines especially for conducting case studies (e.g. Creswell 1998), possibly based on some other tradition such as grounded theory (e.g. Eisenhardt 1989). On the other hand, the proponents of the latter draw from other research methods such as naturalistic, holistic, ethnographic, phenomenological and biographical (e.g. Stake 1995), or suggest considering the case just as a way of organizing the research, for which a method such as ethnography, phenomenology, grounded theory etc. should be chosen.

Case studies differ for example with regard to their paradigm or underlying philosophical assumptions (e.g. Dubé - Paré 2003) and the logic they follow in their analysis of data. Furthermore, they may be divided into e.g. intrinsic (a story worth telling) or instrumental (to accomplish something other than understanding the particular case) (Stake 1995).

This paper employs the division to positivist, interpretative and critical case studies (and not some alternative division, such as that to functionalism, interpretativism, radical structuralism, and radical humanism) because it seems to be perhaps the most commonly used in the field of information systems (Orlikowski - Baroudi 1991, Klein - Myers 1999, Dubé - Paré 2003 etc.). Of these approaches, the positivist paradigm has clearly dominated all research in the IS field, including the case studies (Dubé - Paré 2003, Orlikowski - Baroudi 1991, Goles - Hirschheim 2000). As for interpretative and critical case studies in the IS field, Dubé and Paré (2003) found out that these accounted for twelve per cent and one per cent respectively of the IS case studies published in seven core journals in the 1990's. This paper also agrees with Mingers (2001) in holding that "--*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.*"

Besides the division according to the philosophical bindings, the case studies may also be divided according to the logic they follow in their analysis of data, that is, to theory-testing (deductive) and theory-building (inductive) studies. In short, theory-testing (deductive) case studies follow the natural science model, since it follows hypothetic-deductive logic by first stating hypotheses and then striving to test them (Lee 1989). The deductive case study (more or less) inevitably follows the ('soft') positivist paradigm; holding to its epistemological and ontological beliefs. This is to say that the positivists believe in the existence of a priori fixed relationships that can be identified and tested using hypothetic-deductive logic and analysis; that is, theories are required to be verified or falsified. Furthermore, the positivists hold that an objective physical and social world (that is, a "fixed truth")

exists independent of the researcher. (Tashakkori - Teddlie 1998, Dubé - Paré 2003, Töttö 2000, Goles - Hirschheim 2000, etc.)

The natural science model is widely known and accepted for conducting research in social sciences, and many of the critical voices raised against case studies stem from the perspective of the natural science model, and by recognizing this, it is possible to legitimise case studies using the standards of the critics themselves. Furthermore, a scientific methodology that applies the natural science model complements and supports the methods traditionally associated with case studies (Lee 1989). Moreover, Yin (2003, p. 22) notes the practical value of the propositions deduced from a theory/ theories: "*Only if you are forced to state some propositions will you move in the right direction.*" According to Yin (2003), the proposition reflects an important theoretical issue, and begins to tell the researcher where to look for relevant evidence.

On the other hand, induction speaks of generalizing a conclusion from particular instances. Case studies following inductive logic may also be termed theory-building or exploratory. A case study following inductive logic may not only hold to the beliefs of positivism, but also those of the interpretative or critical philosophical perspectives. Proponents of positivist inductive case studies, such as Eisenhardt (1989), allow the definition of research questions, and even a priori constructs. Eisenhardt (1989, p. 536) notes that "*A priori specification of constructs can – help to shape the initial design of theory building research. Although this type of specification if not common in theory-building studies to date, it is valuable because it permits researchers to measure constructs more accurately.*"

Compared to the positivist perspective on inductive case studies, a fundamental difference the interpretative perspective bears is its primary presumption of social constructionism, and the different ontological and epistemological beliefs (Orlikowski - Baroudi 1991, Klein - Myers 1999, etc). A researcher conducting an interpretative case study may choose among various methodological traditions; including both those suggested especially for case studies (e.g. Creswell 1998) and those typical to qualitative research for example, grounded theory, phenomenology, ethnography, etc.[1]

This paper proposes that for certain research questions and settings, both theory-testing and theory-building research purposes are valid for seeking the answer to the research question posed. To a certain extent, these logically different purposes may require different data but, assuming a single research question, these data sets overlap to a vast extent; even to the point that two separate analyses may be conducted, one employing the theory-testing and the other the theory-building logic.

The aim of this paper is to study what benefits (or disbenefits) combining theory-testing and theory-building analyses in analyzing a single set of data can bring to IS case studies.

Hence, this paper discusses

- *what benefits accrue from analyzing a single set of case study data employing both theory-testing and theory-building logic? What problems and drawbacks would such triangulation create*?

- *what effect does choosing between the philosophical perspectives of positivism and interpretativism have on this combination of analyses*?

In order to launch this discussion, the two types of case study differentiated by the analysis logic, that is, theory-testing and theory-building, are introduced. Secondly, the benefits and drawbacks of methodological (and paradigmatic) pluralism are discussed. Finally, light is shed on the benefits and problems of combining theory-testing and theory-building analyses, first within the positivist paradigm, and then following the beliefs of positivist and interpretative paradigms.

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[1] Both positivist and interpretive paradigms – and consequently the case studies following them – have their benefits and drawbacks. Due to space limitations, it is not possible to include this discussion in this paper. See Orlikowski - Baroudi 1991, Yin 1984 & 2003, Eisenhardt 1989, Lee 1989, Benbasat et al., 1987, Dubé - Paré 2003, Mingers 2001, Walsham 1995, etc.

For practical reasons in keeping this paper clear, focused, and within the permitted length, two dichotomies have been selected: theory-testing vs. theory-building, and positivist vs. interpretative; abduction and descriptive case studies as well as critical (and other) paradigms are left for further research. Furthermore, the focus lies on one-shot case studies whose data are gathered by interviews.

In order to illustrate the issues under discussion, we frame the sample research question: "*How are the post-merger ERP integration change processes managed?*" Post-merger ERP integration is inherently embedded in the organizational merger context, while the research question is of the "how" type and calls for a process-oriented view. All this makes the case study approach a suitable alternative for solving the research problem in question (Eisenhardt 1989, Yin 1984, Yin 2003, etc.). The data collection and analysis for answering the sample research question will be discussed in the following sections.

2 COLLECTING AND ANALYZING DATA FOR THEORY-TESTING AND THEORY-BUILDING ANALYSES: A SAMPLE RESEARCH QUESTION

This section discusses the issues related to data collection for theory-testing and theory-building analyses by continuing to work with the sample research question presented in Section 1. Since both post-merger ES integration and ES implementation are by their very nature about change, it seems reasonable to test a change management theory, for example the Motwani et al. (2002) framework for ERP implementation. On the other hand, since this is a complex phenomenon and the literature on it is scarce, it is feasible to try a theory-building or exploratory research purpose as well. Even though a clean theoretical slate is required, theory-building studies may have pre-defined concepts, too (Eisenhardt 1989, Yin 1984, Yin 2003, etc.).

Interviews can be used as a data collection method for both purposes. They should be conducted at different organizational levels and include representatives of top management, the implementation project management team, selected end-users etc. To ensure empathy on all sides, representatives of the IS department or the software vendor should also be interviewed. Other possibilities could include, for example, observing training sessions, meetings and user support work. Furthermore, the case company's internal documents may prove valuable sources of information.

Semi-structured interviews are an appealing option since the data collected must be suitable for both theory-testing and theory-building analyses – that is, the empirical evidence must cover all data relevant to the theory-testing analysis, but should not be totally structured, in order to theory-building analysis. The literature review necessary for the theory-testing study is likely to yield generic themes that can be used to guide the interviews.

Data collection brings us to the problem of how to ensure that the data are sufficient to cover all the constructs proposed by the theory. Assuming the theory reflects the central elements of the phenomenon in question (as it should), it would be reasonable to expect that only minor things are missing and those can be gathered afterwards.

Unlike statistical analysis, there are very few fixed rules for analyzing case study data. For theory-testing analysis, one of the possible techniques is pattern-matching, that is, comparing the empirically based pattern with a predicted one. (Yin 1984, Yin 2003) In our sample case, the ERP implementation framework proposed by Motwani et al. (2002) suggests that certain environmental characteristics and managerial interventions lead to better outcomes. After collecting the data, it is possible to compare the findings at the case site with the predicted ones. As a result, some parts of the framework may be accepted as given, and others will be modified.

On the other hand, another way to conduct the positivist theory-building analysis could be, for example, explanation building as described by Yin (1984, 2003). Explanation building is an iterative process in which the initial theoretical statement is first compared with the findings, the statement is

then revised, then compared again, etc (Yin 1984, 2003). In our illustrative sample case, an initial statement can be obtained for example from the Motwani et al. (2002) model, but it should of course be in a much more generic form than in the first analysis. Then it is compared with the empirical data, and this process is iterated as needed. As a result, a theoretical explanation is built.

As for the interpretive part, for example grounded theory is an appealing possibility due to its inductive, contextual, and process-oriented nature; also it is an iterative process that requires steady movement between data and concept. (Orlikowski 1993, Borgatti 2005, etc; Eisenhardt 1989.) In our illustrative sample case, data analysis begins by reading (and re-reading) the transcribed interviews in order to discover and label variables. Then, relationships between these concepts are sought, and finally, a core category is selected and other categories are related to it (e.g. Borgatti 2005). Similarly to the exemplary study by Orlikowski (1993, p. 311), the expected result would be "*a context-based, process-oriented description and explanation of the phenomenon, rather than an objective, static description expressed strictly in terms of causality.*"

3 ON METHODOLOGICAL PLURALISM

Mingers (2001) advocates strong methodological pluralism, that is, not only suggesting that each paradigm is more or less appropriate for a particular research situation but arguing that all research situations are inherently complex and multidimensional, and would thus benefit from a range of methods (and paradigms). In short, Mingers (2001) argues that

1. "- - *the real world is ontologically stratified and differentiated - - 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.*" (p. 243) (Cf. Robey 1996, Goles - Hirschheim 2000, Petter-Gallivan 2004.)

2. "- - *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.*" (p. 243-244)

Other advantages of multimethod work include triangulation, creativity and expansion (Tashakkori - Teddlie 1998) (also Mingers 2001, Robey 1996, Goles - Hirschheim 2000, Petter-Gallivan 2004). Assuming one "fixed truth", the positivist paradigm argues in favour of triangulation – no matter whether it is that of empirical evidence (time, place, and persons), researchers, theories, or methods – claiming that it can be used to increase validity. Creativity speaks of discovering fresh or paradoxical factors that stimulate further work, and expansion translates as broadening the scope of the study and embracing broader aspects of the situation (Goles – Hirschheim 2000). Furthermore, "--*diversity advances the valued principle of academic freedom.*" (Robey 1996, p. 404)

The threats inherent in plurality include, for example, the possibility of journals becoming incoherent collections of unrelated reports, scholars not being able to communicate or collaborate with each other, and the IS field ending up at an economic disadvantage in the competitive world of institutionalized knowledge production and education (Robey 1996).

Related to these, Mingers (2001) presents four levels of problems regarding multimethod research: philosophical, cultural, psychological and practical. Mingers' (2001) philosophical problem is that of paradigm incommensurability. The assumption of paradigms being separate and mutually exclusive leads to problems such as those quoted by Robey (1996) (see above), and hence the employment of multiple paradigms has been claimed permissible only in a sequential fashion; but contradictory views can be found, stating for example that even though the central assumptions of the paradigms are incompatible, the paradigm boundaries are permeable (cf. Mingers 2001, Goles - Hirschheim 2000).

Again, the question of cultural feasibility translates into whether the existing set of subcultures facilitates or inhibits the adoption of multimethod approaches (Mingers 2001). In practice, the dominance of the positivist subculture is not likely without an effect. For example, Goles and Hirschheim (2000) suggest social milieu, the search for respectability, and social construction of academic careers as barriers to detaching from the positivist paradigm.

The psychological challenge is one of cognitive barriers. Mingers (2001) reviews literature exploring the links between personality traits, cognition and research preferences; he acknowledges that it has been suggested that the "analytical scientist" type (based on the Jungian personality schema) may prefer hard, quantitative research, whereas "particular humanist" and "conceptual humanist" types are closer to the interpretive or soft systems style of research. A major problem related to these entrenched cognitive predilections is whether they can be altered to facilitate multimethod research. (Mingers 2001) However, one may also argue that these archetypical features of personality are not immutable but change from one situation to another, and also in the course of a person's life; and moreover that these archetypes are not mutually exclusive, that is, renaissance people do exist.

Finally, practical problems include issues such as: different orientations have developed specific ways of answering the types of question they pose, which may not serve in answering the questions of others; the choice of orientation is limited by training histories, departmental or discipline policies and alternative conceptions of social good; it is easier to get well-defined, mono-method work published and approved by providers of funding; etc. (Mingers 2001) Related to this, Goles and Hirschheim (2000) suggest that the barriers to detaching from the positivist paradigm include problematic boundary setting, and unpleasant alternatives to be barriers.

In the following, the scope of this discourse is narrowed by shifting to a discussion concerning the feasibility and possibilities of solving one research question by combining inductive and deductive analyses of a single set of data. Table 1 illustrates the combinations that can be formed by mapping the possible combinations of philosophical perspectives in combining theory-testing and theory-building analyses.

	Analysis 1: Theory-testing	*Analysis 2:* Theory-building	
Philosophical Perspective	Positivist	Positivist	=*Combination 1*
	Positivist	Interpretative	=*Combination 2*

Table 1. Combinations of theory-testing and theory-building analyses

In the following sections, the two combinations presented in Table 1 will be discussed.

4 TRIANGULATION IN ANALYZING A SINGLE SET OF CASE STUDY DATA

4.1 Combining theory-testing and theory-building analyses within the positivist paradigm

In this section, potential benefits and drawbacks of combining theory-testing and theory-building logic, where both follow the beliefs of the positivist paradigm, are discussed. In short, this type of triangulation is feasible because by combining these two research purposes it is possible to:

(1) obtain better results even where the two research purposes perform similar functions, since a research study is usually a process that typically proceeds through a number of phases, and some research methods and research purposes tend to be more useful in some phases than others,

(2) increase validity through triangulation: obtaining the same result using the two different analyses validates the result,

(3) catalyze the discovery of fresh or paradoxical factors that stimulate further work,

(4) broaden the scope of the study embracing broader aspects of the situation, and

(5) advance the valued principle of academic freedom by promoting diversity.

(See: Mingers 2001, Tashakkori - Teddlie 1998, Robey 1996, Goles - Hirschheim 2000, Petter-Gallivan 2004.)

These potential benefits can be further classified into three categories: a better understanding of the phenomenon in question (benefits 1 & 3), an improved research process and quality (benefits 2 & 4), and individual and social benefits (5).

Inevitably, this approach also engenders problems. To begin with, the abovementioned positivist view of triangulation as a tool for validation can be criticized from within the paradigm, by for example raising the problem of circular argumentation; that is, the results obtained using one method are thought to validate the results obtained with another, without considering the possibility of error or coincidence. Furthermore, for example, in case studies, the use of multiple sources of evidence and multiple methods is recommended – is this triangulation?

Problems peculiar to combining inductive and deductive logic for analyzing a single set of data stem from the fact that in order to carry out deductive analysis, the researcher must have a theory of interest, predictions from the theory, and rival theories (Dubé - Paré 2003, Yin 1984, Yin 2003, etc.), but inductive analysis requires a clean theoretical slate (Dubé - Paré 2003, Eisenhardt 1989 etc.).

These problems are related to those of multimethod research, as presented in Section 3. First, conducting both theory-testing and theory-building analyses within the positivist paradigm makes the problem of paradigm incommensurability redundant in this case. Secondly, as this approach complies with the positivist culture, the positivist subculture may not inhibit taking up the approach as such, and researchers may not want to risk their respectability as might happen in adopting some other paradigm. However, the assumed 'correct' answers to questions such as 'what is science' and 'how should a research report look' may act as practical barriers to publishing work of this type. It is likely that there are differences with regard to this between for example North-American and European Journals.

Thirdly, the requirement of having, simultaneously, a theory of interest on the one hand and a clean theoretical slate on the other, is more or less schizophrenic. As a solution, the researcher could try, first, acknowledging the presuppositions that may effect the analysis; and secondly, it may help to conduct the inductive analysis as a first step. Furthermore, following the fact that both analyses hold the positivist belief of "fixed truth", it is possible for another researcher who is unfamiliar with the theoretical predictions to carry out the inductive analyses.

As this kind of triangulation may be implemented in order to validate results, there is a risk of the theoretical knowledge and/or results from the deductive analysis (or the researcher's sincere desire to obtain the same results) interfering with both the process of employing inductive logic and the results of that process. Finally, other practical problems – such as the limitations of the orientations with regard to their ability to (and conventional ways to) answer different types of research question, departmental or discipline policies, and acceptability of the research by its audience – quoted by Mingers (2001) cannot be neglected.

Now we look back to the illustrative sample research question used in this paper. First, we may strive for the benefits of obtaining better results and increasing validity by triangulation. Secondly, due to the complex, multifaceted and multidisciplinary nature of post-merger ERP integration, the benefits of

discovering fresh or paradoxical factors as well as embracing broader aspects of the situation seem to be especially appealing. The problems quoted above are all likely to prevail at least to some extent, and need be solved. However, discussion on their solution is left for further research.

4.2   Combining theory-testing and theory-building analyses: two paradigms

It is frequently suggested that research methods are bound to particular paradigms, and as the paradigms are held to be incommensurable, it is logically incoherent to combine methods from different paradigms (Mingers 2001). However, Mingers (2001, p. 243) criticizes this view by discussing the nature and use of the concept of paradigm, and suggests that "--*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.*" Bearing in mind this demand for a critical and knowledgeable approach, we now aim to identify the feasibility and possibilities of combining two types of analyses (positivist theory-testing and interpretative theory-building) for studying a single set of case study data.

Because the epistemological and ontological beliefs of the two paradigms in question clash, the 'traditional' (positivist) justifications for employing triangulation become unsuitable. Whereas the positivist paradigm advocates using triangulation to discover the "fixed truth" by viewing it from different angles, the interpretative paradigm assumes a subjective truth that is constructed during interviews, interpretation, analysis, etc., and hence, the two different research processes are expected and supposed to yield different results (and similar results would be mere happenstance). Hence, other justifications for combining these two research purposes must be found.

This type of triangulation that employs two different paradigms is feasible because by combining these two research purposes it is possible to:

(1) contribute to dealing effectively with the full richness of the real world; because the real world is ontologically stratified and differentiated, and different paradigms focus attention on different aspects of the situation,

(2) yield a better result even where they do perform similar functions, since a research study is usually a process that typically proceeds through a number of phases, and some research methods and purposes tend to be more useful in relation to some phases than others,

(3) catalyze the discovery of fresh or paradoxical factors that stimulate further work, and

(4) broaden the scope of the study, embracing broader aspects of the situation. The latter includes also cases where different results constitute answers to different research questions.[2]

(5) obtain a richer picture of the phenomenon in question, which may be considered valuable as such,

(6) explore which would be the 'best' method to solve the research problem in question, which may contribute to not only solving the research problem, but possibly also to the academic discussion on methodology, and

(7) advance the valued principle of academic freedom by promoting diversity.

(See: Mingers 2001, Goles - Hirschheim 2000, Robey 1996, Tashakkori - Teddlie 1998, Petter-Gallivan 2004.)

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[2] In brief, 1-4 together with the critiques towards the assumption of paradigms being separate and mutually exclusive leading to problems such as those quoted by Robey (1996) (see above), provides a sufficient even though surely not exhaustive solution to the problem of paradigm incommensurability.

These potential benefits can be further classified into three categories: a better understanding of the phenomenon in question (benefits 1, 2, 3 & 5), an improved research process and quality (4 & 6), and individual and social benefits (7).

On the other hand, undertaking the attempt to combine theory-testing and theory-building analyses following different ontological and epistemological beliefs is bound to bring with it not only the questions of paradigm incommensurability but also other problems that are primarily similar to those of multimethod research (see Section 3).

First, even though there is no theoretical, topic or methodological congruence in the IS field, the dominance of the positivist subculture still clearly prevails (Orlikowski - Baroudi 1991, Robey 1996; cf. Goles - Hirschheim 2000). However, this dominance seems to be (at least slightly) diminishing, due in particular to the influence of European research traditions (Benbasat - Weber 1996). Issues such as the search for respectability and the social construction of academic careers, as Goles and Hirschheim (2000) put it, are not likely to hinder the adaptation of this approach since it does not require abandoning the positivist paradigm altogether.

All in all, having the freedom to choose the paradigm most suitable for the research setting in question is facilitated if the choice of philosophical perspective is seen as a practical issue and not a question of (almost) religious conviction. But as Goles and Hirshheim (2000) note "- -*migrating from one frame of reference to another is tantamount to a religious conversion*- -".

The psychological barriers related to this combination of types of analysis are twofold. First, similarly to combining inductive and deductive analyses within the positivist paradigm, the schizophrenic requirement of having, simultaneously, both a theory of interest and a clean theoretical slate, persists. Again, recognizing and making one's presumptions and beliefs explicit as well as carrying out the inductive analysis first or even having a break from working with the particular project may help.

Secondly, assuming that cognitive predilections are more or less fixed and do dictate a researcher's suitability for conducting research using certain methods (and unsuitability for using others), it may be even more schizophrenic to require that a single researcher be suitable for carrying out the two types of analysis following the contradicting ontological and epistemological beliefs of the two different philosophical perspectives. However, as described in Section 3, the cognitive predilections may not be entrenched. Indeed, examples of this type of parallel paradigm crossing can be found, including e.g. Hassard (1991), Martin (1992), and Lacity and Hirschhem (1993) as quoted by Goles and Hirschheim (2000).

Finally, in a similar vein to combining the two types of analysis logic within the positivist paradigm, some practical problems prevail; these include issues such as the limitations of the different orientations, the choice of orientation being limited by training histories, departmental discipline policies and alternative conceptions of social good, problematic boundary setting, and the acceptability of the research to its audience (Goles - Hirschheim 2000, Mingers 2001). Compared to combining the two types of analysis logic within the positivist paradigm, some of these problems, such as that of acceptance of research, are likely to be aggravated when adopting more than one paradigm. However, again, there are likely to be differences between e.g. the North-American and European communities.

Moreover, the researcher must have a thorough understanding of the two paradigms, which hold to different (or even contradictory) ontological and epistemological assumptions that must not be confused.

The last practical problem is tied to the fact that this approach is likely to be more time-consuming than some other tried-and-tested ways of writing papers – which may be problematic in today's "publish or perish" environment. The solution is highly contextual and comes down to the researcher's individual preferences with regard to, for example, learning, challenge, achievement, number of publications aspired to, and conventionality.

In the following, we return to the illustrative sample research question regarding post-merger ERP integration to see how the abovementioned issues relate to it.

As noted in the previous section, post-merger ERP integration is a complex, multifaceted and multidisciplinary phenomenon. Therefore, the benefits, such as dealing with the full richness of the real world and obtaining a richer picture of the phenomenon, along with broadening the scope of a study as well as discovering fresh and paradoxical factors, seem especially appealing.

Obtaining these benefits is facilitated by the very different types of results provided by the different analysis modes; that is, theory-testing analysis is likely to result in a more objective, static description expressed strictly in terms of causality. The grounded theory type of analysis strives for a context-based, process-oriented description and explanation of the phenomenon. Furthermore, the importance of getting better results is emphasized by the practical relevance and contemporariness of the research problem.

All the abovementioned problems are likely to appear at least to some extent. When studying such a complex and multifaceted phenomenon as post-merger ES integration, the research task is inevitably challenging. Therefore, it is of the utmost importance to keep under control problems such as the paradoxical requirement of having, simultaneously, a theory to be tested and a clean theoretical slate, and of not confusing the philosophical beliefs of the research purposes. On the other hand, the practical relevance of the problem should solve at least some of the issues with regard to acceptability and publishing.

5 SUMMARY AND CONCLUDING REMARKS

Case studies may be classified according to their philosophical perspectives (e.g. positivist, interpretive, critical) as well as to the logic of the analysis of their data (theory-building and theory-testing). The aim of this paper is to discuss the potential benefits and problems involved in combining the theory-testing and theory-building research purposes in analyzing a single set of case study data. Furthermore, this paper discusses these benefits and problems both when the two analyses are conducted within the positivist paradigm, and when the positivist and interpretive paradigms are combined. An imaginary research design on post-merger ERP integration is used to illustrate these issues.

The potential benefits of this type of analysis triangulation include a better understanding of the phenomenon in question, an improved research process and quality, and individual and social benefits. Independently of whether the paradigm followed is positivist alone, or a plurality of paradigms prevails, combining the two types of analysis engenders largely similar benefits. However, when used within the positivist paradigm, this type of "triangulation" increases validity. But, on the other hand, the use of multiple paradigms disables this quality, but facilitates instead getting a richer picture of the phenomenon in question, contributing to dealing effectively with the full richness of the real world and exploring which would be the "best" method to solve the research problem in question.

On the other hand, philosophical, cultural, psychological and practical problems are encountered. Some of these stem from the requirement that in order to carry out a deductive analysis, the researcher must have a theory of interest, predictions from that theory, and rival theories; but carrying out an inductive analysis requires a clean theoretical slate.

There are some differences between the problems of combining the theory-testing and theory-building analyses within the positivist paradigm, and those of using two different paradigms. In brief, the latter engenders more problems, and most the problems of adopting this approach are common to all multimethod research.

First, there is the philosophical problem of commensurability, and secondly the dominance of the positivist sub-culture may in various ways impede the combination of the analyses based on the

assumptions of different paradigms. These include, for example, the respectability of the research, possibilities for publication, and so on.

Taking into account the problems quoted above, it is acknowledged that the approach presented in this paper is not suitable for all research questions, settings or researchers.

Nevertheless, bearing in mind the benefits promised, adopting the approach and using it critically and knowledgeably can be recommended when it does indeed suit the research task in question, and when a reasonable differentiation is achievable between the two research purposes. This is in concord with the spirit of pragmatism (Goles - Hirschheim 2000, Tashakkori - Teddlie 1998, etc.), as well as with such advocates of methodological and paradigmatic pluralism as Goles - Hirschheim 2000, Mingers 2001, Orlikowski - Baroudi 1991, Robey 1996 etc. that call for dealing with the full richness of the world; and promote a more reasoned and reflective adoption of these two research purposes for studying the diverse topics within the IS field.

Since this paper studies the possibilities of paradigm triangulation in the analysis of qualitative case study data, performing a similar exercise with other types of empirical evidence in case studies is recommended. More importantly, topics for further research include exploring how to obtain the benefits promised and solve the problems discussed.

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