

MIND THE GAP: POSITIONING INFORMATION SYSTEMS/INFORMATION TECHNOLOGY WITHIN THE PROCESS OF POST-MERGER INTEGRATION

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Abstract

This paper assesses IS research on the role of Information Systems (IS) and Information Technology (IT) in the context of mergers and acquisitions (M&A). It first presents the main theoretical perspectives on M&A with an emphasis on the post-merger integration process. It then analyzes IS/IT studies in terms of their theoretical perspective, their logical structure, their knowledge relevancy, and the nature of the IS/IT phenomena studied and synthesizes what has been learned from these studies. Finally, it identifies methodological and theoretical issues and suggests research avenues.

Keywords

Information Technology; Post-merger Integration; Literature Review

Introduction

Mergers and acquisitions (M&A) are one means that an organization can use to expand and/or diversify. A *merger* usually involves full amalgamation of two or more separate organizations into a third (Marks and Mirvis, 1998). An *acquisition* refers to the purchase of a target organization for absorption into the acquiring organization. The literature, be it in management, economics, business history, industrial organization, or finance generally holds the term “merger” to include both phenomena (Marchildon 1991). Hence, this paper will use the term *merger* instead of M&A.

Mergers have attracted academic interest as merger waves emerged. After a brief but sharp decline between 2000 and 2002 with deal values of \$441 billion in 2002 as compared to \$1.2 trillion in 2000, U.S. and U.S. cross-border global merger activity has been on the rise again with deals totaling \$823 billion in 2004, \$1,23 trillion in 2005, and \$1.48 trillion in 2006 (Mergerstat, 2007). With such sums involved, it is crucial that the expected synergy, that is, the sum of the net benefits created by the process of interaction of the organizations involved in the merger, indeed materializes (Larsson and Finkelstein, 1999). The success of mergers is, however, rather low, with a failure rate of almost 70% (Levinsohn, 2002). Post-merger integration is viewed as the “real source of value creation; poor integration has been identified as the main cause of failures (Haspeslagh and Jemison, 1991, p.167).

IT integration, in terms of IT “fit” (Buck-Lew et al., 1992), success factors (Robbins and Stylianou, 1999), and integration strategies (Wijnhoven, 2006), has been argued to be critical when planning and implementing a merger. Yet, studies that focus on this topic seem to be few and far between, and are largely silent on how the process of post-merger IT integration interacts with the organizational integration process. This study assesses the literature on post-merger integration in order to evaluate what we know and what we don’t know on the role of IS/IT in this context. To do so, the paper presents the main schools of thought of the literature on mergers; it synthesizes the literature on post-merger IT integration by analyzing it along four dimensions; finally, it identifies methodological and conceptual issues that researchers should address when studying post-merger IT integration.

Studying Mergers: The Main Schools of Thought

Mergers comprise three phases: courtship or pre-merger, merger decision, and post-merger integration (Marks and Mirvis, 1998). The first two phases include the strategic and financial analysis that would determine the potential benefits or synergies. Post-merger integration refers to the actual process of value-creation (Haspeslagh and Jemison, 1991). Mergers have been the focus of studies in a number of fields, including Economics, Finance, Strategic management, and Organization Studies (OS). Over the years, researchers have analyzed the phenomenon from four perspectives that have distinct theoretical foundations and central hypotheses: 1. Finance and Economics; 2. Strategy; 3. Organization Theory; and 4. Process perspective (Haspeslagh and Jemison, 1991).

The *Finance and Economics* school is concerned with potential wealth creation associated with a merger (e.g. Franks et al., 1991). The *Strategy* school advances the concept of “strategic fit” or “relatedness” which is defined as “the degree to which the target firm augments or complements the parent’s strategy” (Jemison and Sitkin, 1986, p.146). This school focuses on the link between merger performance and strategic attributes of the combining companies (e.g. Homburg and Bucerius, 2006) and pre-merger planning (e.g. Main and Short, 1989). However, counting on relatedness-based synergies, the Strategy school developed its main weakness, namely, its sustained “emphasis on the strategic task, leaving aside practical impediments to value creation such as interpersonal, inter-organizational and intercultural friction” (Haspeslagh and Jemison, 1991, p.302). The *Organization Theory* school’s focus is on the post-merger effects on organizational structures and work relationships and on how individuals respond to post-merger issues (Haspeslagh and Jemison, 1991). This perspective regards post-merger integration in terms of acculturation (Larsson and Lubatkin, 2001), attaining compatibility of management practices (Datta, 1991), organizational structures (Lubatkin et al., 1998), or of mitigating issues at the individual level such as, stress, uncertainty, commitment and resistance to merger. Finally, the *Process* school provides an analytical construction of the integration process by combining organizational and strategic elements. The proponents of this school view integration as the mechanism of coordination of the activities of the combined organizations in order to bring to fruition the potential of the interdependences that have motivated the merger (Shrivastava, 1986). Contingency integration frameworks have been proposed, which examine how different integration approaches may impact the merger outcomes (e.g. Birkinshaw et al., 2000), and the effect of the emergent roles of professionals during the post-merger period on the outcomes of the integration process have been studied (e.g. Balogun et al., 2006).

In sum, while the Finance and Economics school concentrates on the potential synergies of the mergers and tends to ignore the post-merger integration process (Haspeslagh and Jemison, 1991), the other three schools approach the issue of post-merger value creation differently. The Strategic perspective relies on the “relatedness” or “planning” concepts in order to attain an “elusive strategy performance linkage” (Haspeslagh and Jemison, 1991, p.300). The Organization theory scholars emphasize the effects of the impact that mergers have on organizations and the behavioral response of the individuals involved, while the Process perspective stresses the fact that sound theories of merger outcomes must include not only financial and strategic factors that predict potential value, but also the dynamics of the post-merger integration process that bring to fruition the potential synergies (Javidan et al., 2004). Considering this, we only focused on the latter three schools for identifying studies on post-merger integration issues.

Literature on Post-merger IS/IT Integration

In a post-merger context, IT integration implies that “exchanges of data and organizational processes, according to the merged organizational needs, are possible and efficient” (Giacomazzi et al., 1997, p.290). The professional literature emphasizes the importance of IT integration during post-merger (Boston Consulting Group, 2004). A survey of 334 senior business and IT executives involved in mergers found that IT integration was cited as the most critical factor for merger success (Curtis and Chanmugam, 2005). This motivated our review of the academic literature to assess how researchers are addressing it. We conducted a two-phase literature review that covered the years from January 1987 to January 2007. First, we searched the strategic management and organization literatures for articles that focused on the post-merger integration phase, and we cross-examined the articles in order to identify studies that included IT/IS integration elements. Second, we identified, in the IS literature, articles on post-merger IT integration.

We used four main sources: 1. Databases: ABI/INFORM and Science Direct; 2. Scholarly journals that cover strategic and organizational issues: Academy of Management Journal, Academy of Management Review, Strategic Management Journal, Organization Studies, Long Range Planning, Strategic Change, Information & Management, and Journal of Strategic Information Systems; 3) The top 5 IS journals according to the MIS journal rankings provided by AISWorld Net (Saunders, n.d.): MIS Quarterly, Information Systems Research, Communications of the ACM, Management Science, and Journal of MIS; 4) The “ancestry” technique of article identification (cf. Cooper, 1998) which implies reviewing citations from the articles previously identified. Accounting, Auditing & Accountability journal and the proceedings of HICSS, ECIS and AMCIS were then included. The search yielded 77 articles, 18 of which focused on IS/IT integration. These 18 articles were, with one exception (Granlund, 2003), published in IS journals.

Each article was analyzed along four dimensions – described below – to better circumscribe its nature and its contribution.

Schools of thought – The articles were classified within one of the four schools of thought typology proposed by Haspeslagh and Jemison (1991).

Logical structure – The logical structure of a theoretical development “refers to the time span of theory [...] and to the hypothesized relationships between antecedents and outcomes” (Markus and Robey, 1988, p.584). There exist two types of logical structure: variance models and process models. Variance models hypothesize associations between predictors and outcomes. They assume that variation in predictors accounts for variation in outcomes and represents an invariant, necessary and sufficient relationship. Process models explain how outcomes of interest develop through a sequence of events (Mohr, 1982). These antecedent events are necessary but not sufficient for the outcome, which are therefore only partially predictable from knowledge of the process¹.

Type of knowledge relevancy – A research paper entails a reasoned argument that presents the reader with supporting evidence for its conclusions and contains a certain level of abstraction when describing the study’s tenets and methodological procedures. Drawing on the tenets of the argumentation theory (Toulmin, 1958) and on the discourse of practice of relevance (Benbasat and Zmud, 1999) we created a four-quadrant typology of knowledge relevancy (Figure 1), along two dimensions: the level of abstraction and the level of the knowledge’s trustworthiness. Based on Benbasat and Zmud’s (1999) description of “relevancy”, we consider that an article can be: a) relevant to practitioners by having “implementable” implications and providing a “painless” approach (less abstraction, pragmatic tone, more real life facts) for IS professionals to access a “state of knowledge” that will be used to solve a problem or make the most of an opportunity; and b) relevant to IS researchers by stimulating critical thinking with a “scholarly” tone, and elaborated illustrations of the theoretical foundation and methodologies used. Regardless of the direction – practitioner or academia – in which an article is leaning, however, it may contain valid or flawed argumentation. Indeed, “relevancy doesn’t imply that research needs to be carried out in a less rigorous fashion” (Benbasat and Zmud, 1999, p.5). In this vein, we assessed also the knowledge trustworthiness of an article in terms of correctness of use of appropriate methods and analyses (Benbasat and Zmud, 1999) and validity of the logic of argumentation. For the latter, we used Hart’s (2001) six prerequisites for an article to be considered as having a sound logical structure: a reliable structure to sustain proper argumentation; clear concept definition; reasons for claims; substantiated assumptions; avoidance of logical fallacies; use of legitimate and relevant, not anecdotal, evidence. The four quadrants are:

Q1: The Anecdotal – The articles in this view are often characterized as “popular literature” that advance claims based on “anecdotal” evidence;

Q2: The Less Rigorous – The articles categorized in this quadrant challenge reader’s causal assumptions with interesting ideas but based on unclear arguments, or in the case of empirical studies, by inappropriate or/and less rigorous methodologies.

Q3: The Implementable – The authors’ argumentation is prescriptive without much abstraction. The articles that fit this description, even though they are published by scholarly journals, target mainly the practitioner audience;

Q4: The Critical Thinking – These articles present a high level of rigor and knowledge trustworthiness and are published by top academic journals.

¹ The Process school perspective on mergers and the Process model as a type of logical structure of a theoretical model are two different and unrelated concepts.

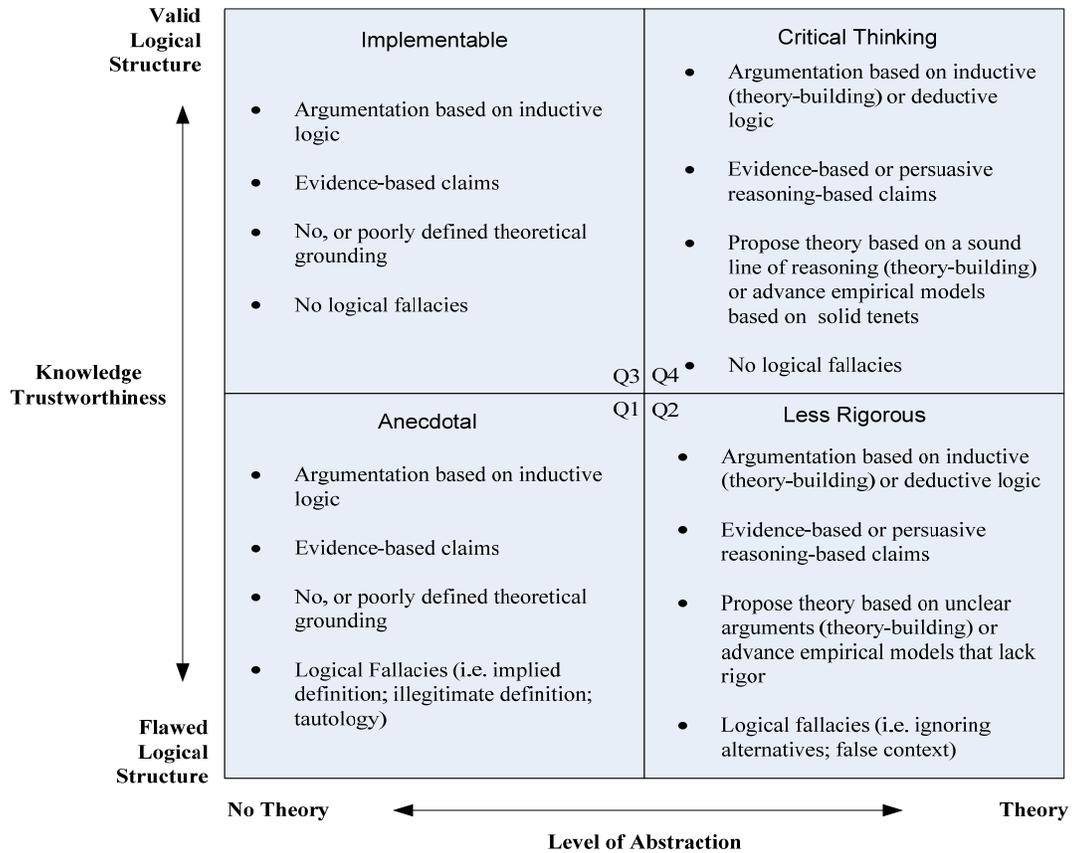


Figure 1. Typology of knowledge relevancy

Nature of the IS/IT phenomenon studied – From our analysis of the 18 IS/IT integration articles, two themes coalesced:

Theme 1: Post-merger IT Integration Strategies and Outcomes - IT integration is assumed to be an antecedent of the merger outcomes; focus is on identifying/measuring IT integration success factors, assessing related decisional issues, and providing contingency frameworks.

Theme 2: Relationship between Post-merger IT Integration and Business Integration - Articles that study if and how the processes of post-merger IT integration and business integration are interdependent.

Table 1 synthesizes the results.

Theme 1: Post-merger IT Integration Strategies and Outcomes

Fully 14 of the 18 articles fell under this theme. These studies were aimed at: (1) identifying/measuring IT integration success factors, (2) assessing decision-making issues, (3) analyzing human resources integration challenges, or (4) emphasizing the importance of the level of IT integration in adopting different organizational integration strategies. Factors such as IS participation in merger planning, level of IS standardization, programming language incompatibilities (Stylianou et al., 1996; Robbins and Stylianou, 1999), IS personnel retention (Hwang, 2004), resistance to change, cultural readiness, and learning capacity (Alaranta, 2005) have been empirically found to have an impact on the results of the process of IT integration. In their longitudinal study, Main and Short (1989), stress the importance of planning the post-merger IT integration, without however, revealing the outcomes. Decision-making are studied at the organization level of analysis by providing process models that enhance our understanding of relationships between design decisions, implementation activities and IT integration outcomes (Mehta and Hirschheim, 2004; Granlund, 2003). Human resource integration issues are addressed by assessing the impact of the merger on individuals’ acceptance of new IT (Huang and Chuang 2007) or by identifying the factors affecting post-merger integration of IS personnel (Alaranta and Viljanen, 2004). Some authors emphasize the importance of the concept of level of IT integration. In the literature on mergers it has been argued that realized synergy is greater than the sum of its parts (Hitt et al., 2001). One measure to assess the outcomes of the

interdependencies of the involved organizational structures in a merger is the level of integration, which can be defined as the degree of post-merger change in organizational structures (Pablo, 1994). Even though we couldn't find a formal definition, based on Wijnhoven et al.'s (2006) argumentation, the level of IT integration reflects "the level of strategic interdependence and organizational autonomy that the merging firm aims at" (p.8). In theory, high levels of integration should result in the realization of positive IT interdependency-based synergies (Pablo, 1994). However, based on Javidan et al.'s (2004) assertion that high levels of integration may create negative synergies caused by the negative influence of various structural incompatibilities between the two organizations, we can argue that high levels of IT integration may result in adverse technological dichotomies. While IT integration is considered the main antecedent of the value (synergy) creation, the level of IT integration concept has the potential to reveal issues related to the trade-off between positive and negative synergies and to influence decision-makers during the integration design process. In this vein, a number of articles advance contingency frameworks that propose different levels of IT integration according to IS requirements, organizational structure differences, growth objectives (Giacomazzi et al., 1997), type of IS governance (Brown and Renwick, 1996), level of strategic importance of the IS function, lines of communication, organizational IS learning (Merali and McKiernan, 1993), "fit" within and between the IT configurations of the merged entities (Johnston and Yetton, 1996) or IT-business alignment (Wijnhoven et al., 2006). These contingency frameworks were empirically tested and different levels of IT integration were found to be appropriate for different merger synergies.

We observe that the majority of the articles (10 out of 14) are positioned within the Process school of thought. Most of the studies – with the exception of the two articles that present a logical structure of a process model – advance variance models. Finally, there were a slightly higher number of articles that fell in the "implementable" quadrant (Q3) than in the "critical thinking" quadrant (Q4).

Table 1. Literature on Post-merger IT Integration

	Variance Models		Process Models	
	<i>T1: Post-merger IT integration strategies and outcomes</i>	<i>T2: Relationship between Post-merger IT Integration and Business Integration</i>	<i>T1: Post-merger IT integration strategies and outcomes</i>	<i>T2: Relationship between Post-merger IT Integration and Business Integration</i>
	Source (conceptual or empirical/knowledge relevancy quadrant)			
Strategic School	Main & Short (1989) (empirical/Q3)	Buck-Lew et al. (1992) (empirical/Q3)		
Organization School	Alaranta and Viljanen (2004) (conceptual/Q3) Huang and Chuang (2007) (empirical/Q4)	Weber and Pliskin (1996) (empirical/Q4)		
Process School	Alaranta (2005) (empirical/Q3) Brown & Renwick (1996) (empirical/Q4) Giacomazzi et al (1997) (empirical/Q4) Hwang (2004) (conceptual/Q3) Johnston & Yetton (1996) (empirical/Q4) Merali & McKiernan (1993) (empirical/Q3) Robbins & Stylianou (1999) (empirical/Q4) Stylianou et al. (1996) (empirical/Q4) Wijnhoven et al. (2006) (empirical/Q4)	Brown et al. (2003) (empirical/Q3) McKiernan and Merali (1995) (empirical/Q3)	Granlund (2003) (empirical/Q4) Mehta & Hirschheim (2004) (empirical/Q4)	

Theme 2: Post-merger IT Integration and Business Integration

Research falling under this theme focuses on the interdependence between the two processes of post-merger integration: organizational and/or strategic elements and IT elements. This relationship is analyzed in different ways: by empirically testing how the level of IT integration and organizational culture are related to the level of effectiveness of the merger and the organizational culture impacts the outcomes of IT integration (Weber and Pliskin, 1996), by assessing the role of IT during the post-merger business integration (McKiernan and Merali, 1995), by emphasizing the importance of planning the post-merger IT integration (Brown et al., 2003), or considering IT as being another dimension, besides organizational and strategic, of the “fit” between the merged organizational forms (Buck-Lew et al., 1992).

Overall, the articles present the relationship between the two processes of integration from a deterministic view by adopting variance models and none advances a process model approach to study how the events unfold over time. In terms of knowledge relevancy, we found an equal number, three, of articles in quadrants Q3 and Q4. We also observe that, contrary to the first theme, the articles spread in an almost equal manner across the three schools of thought.

Discussion and Conclusion

Our review shows that although IT “fit” has been found to be an important dimension of post-merger integration (Buck-Lew et al., 1992) and that IT integration has been found to have an important impact on the outcomes of a merger (McKiernan and Merali, 1995), the topic, especially the interrelatedness of the processes of IT and business integration, has received relatively little attention. Some issues are raised and suggestions for future research are proposed.

Issue 1: Relationship between the processes of IT and Business post-merger integration. Our literature review shows that organization research has not paid much attention to the issue of IT integration and that IS research has considered IT independently of its social context, as they appear to conceptualize IT integration as a phenomenon independent from the rest of the post-merger integration process. Also, the four articles that study the interdependence between IT and the business integration process (see Table 1) adopt a deterministic approach where the IT is seen as an object that determines organizational structures. It has been argued, however, that IT is simultaneously a social and a physical artifact (Orlikowski and Barley, 2001). From such a perspective, “neither a strictly constructivist nor a strictly materialist stance is adequate for studying technologies in the workplace” (p.149). This emergent perspective (Markus and Robey, 1988) holds that organizational and technological change emerges unpredictably from complex social interactions. Adopting such a perspective to study the role of IS/IT integration in the process of post-merger integration would contribute to a better understanding of the phenomenon.

Issue 2: Post-merger knowledge sharing and IT. One of the objectives post-merger integration is to ensure that conditions for cooperation and learning among personnel from the merged organizations are created and decision-making design is based on accurate information (Schweiger and Goulet, 2000). The Process school states that post-merger integration is a complex learning process that can be dealt with by organizing merger workshops on the new practices (e.g. Leroy and Ramantsoa, 1997). Knowledge transfer between the merged companies is a key factor for successful integration (Hebert et al., 2005). Our literature review reveals that the three schools of thought on post-merger integration, however, do not take into consideration the role of IT during the post-merger learning process; similarly, the IS literature on IT integration does not study the role of IT in the process of cross-boundary coordination practices between the members of the newly merged organizations. Changing employees’ mindsets and the integration of two knowledge bases are difficult tasks. Despite the fact that the Organization literature mentions the potential of mergers as a means of gaining access to new knowledge and the importance of its sharing during the post-integration process, few studies have focused on the factors facilitating knowledge sharing and the tools to assure its efficiency. The literature on knowledge management has stressed the importance of relying on individuals to execute boundary spanning activities (Pawlowski and Robey, 2004). In IS literature, boundary spanners are assisted in facilitating the sharing of expertise across intra- or inter-organizational boundaries by IT artifacts that have the role of boundary objects (Levina and Vaast, 2005). Drawing on this perspective, IS researchers can enhance the understanding of the role of IT artifacts in the process of knowledge transfer across the boundaries between the communities of practice, which during the post-merger period need to learn how to share their expertise and how to collaborate within the structures of the new organizational form.

Issue 3: Process versus Variance models. Only two of the reviewed studies’ logical structure was of a process nature. It has been argued that IT-driven organizational change is a social process (Orlikowski, 1996), and that a theory of change is best framed as a process theory than as a variance theory (Mohr, 1982). It has been argued, however, that the interaction between IT and humans in an organizational environment, however, cannot be regarded as a one-dimensional, causal relationship (Orlikowski and Baroudi 1991). In the case of a radical change such as a merger, process models can handle

more complex causal relationships than variance models can and provide an explanation of how the inputs and outputs are related at different levels of analysis, rather than simply identifying the relationship like the variance models do. Process models that are analyzed with appropriate strategies can be used by IS researchers as complementary to deterministic-type models in terms of the source of otherwise unobservable elements that might increase the internal and external validity of the variance models (Sabherwal and Robey, 1995).

Issue 4: Need for composite multi-level theories of change. Our analysis, based on the knowledge relevancy dimension, identified only 10 articles from a total of 18 that present a solid theoretical foundation. These studies, with the exception of Mehta and Hirschheim's (2004), advance mono-lens theories of change. Organizational change, however, is difficult to explain without recourse to several theoretical lenses that are often used separately in analyzing a single process (Lapointe and Rivard, 2007). It has been suggested that a composite theory is more appropriate to explain change (Poole and Van de Ven, 2004). In this view, the process of change is governed by four different "motors" (life-cycle, teleological, dialectical, and evolutionary), which are generic mechanisms derived via induction from the narrative stories of events of organizational change. A multi-level combination of "motors" will accurately describe the "what", "how" and "why" of organizational change. Researchers should consider using such composite theories of change that include different "motors" that act at different levels of analysis when analyzing post-merger IT integration. For example, we can consider the post-merger IT integration process in an organization from a dual-motor perspective, teleological and dialectical. We assume that change is driven by the actions of individuals, usually managers that try to create a new organizational form. These individuals are usually assumed to be rational as they are perceived in the traditional teleological models of IT adoption. However, a teleological perspective of change at the micro level of analysis oversimplifies or overlooks the period of organizational transition from the old practices to the new ones imposed by new organizational arrangements and eventually supported by a new technology. A dialectic motor at the organizational level of analysis describes how the divergent goals of individuals produce organizational change. At the same time, because the dialectical process encapsulates teleological forces in opposition, the two motors are coexistent in an interdependent relationship.

Post-merger integration is a journey, not a discreet one time event (Yu et al., 2005). In this vein, we consider that a cross-disciplinary, processual and multi-level perspective can help IS researchers understand the complex process of post-merger IT integration and its interdependence with the business integration process. However, in adopting this approach, they should rigorously adopt and define out-of-discipline concepts and take into account methodological issues, such as the analysis of the process data, implied by a process theory approach.

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