Understanding Information Systems Integration Deficiencies in Mergers and Acquisitions
A Configurational Perspective

Henningsson, Stefan; Kettinger, William J.

Understanding Information Systems Integration Deficiencies in Mergers and Acquisitions: A Configurational Perspective

Stefan Henningsson and William J. Kettinger

Journal article (Post print version)

Understanding IS Integration Deficiencies in Mergers and Acquisitions: A Configurational Perspective

Stefan Henningsson & William J. Kettinger

STEFAN HENNINGSSON (sh.itm@cbs.dk) is Associate Professor at Copenhagen Business School, Department of IT Management. His research addresses managerial aspects of IT in contexts that include mergers and acquisitions, global IT infrastructures and international trade processes. He has published more than 100 peer-refereed papers in journals including *ISJ, EJIS, JSIS*, and *MISQ Executive*.

WILLIAM J. KETTINGER (bill.kettinger@memphis.edu) is the FedEx Chaired Professor at the Fogelman College of Business and Economics at the University of Memphis. His focus is practical, rigorous research appearing in leading journals including *MIS Quarterly*, *ISR, JMIS, JAIS, EJIS, ISJ* and *SMR*. He currently serves as a Senior Editor of *MISQ* and *MISQ Executive* and serves, or has served, as an Associate Editor of *MISQ*, and *ISR, JAIS* and has served as a special editor for *JMIS* three times.

Abstract

Information systems (IS) integration is a critical challenge for value-creating mergers and acquisitions. Appropriate design and implementation of IS integration is typically a pre-condition for enabling a majority of the anticipated business benefits of a combined organization. Often, IS integration projects are subject to deficiencies (e.g., loss of the target firm's business capabilities with expedited integration) that limit value creation. Drawing on a configurational perspective, we re-analyze 37 published case studies of problematic IS integrations and identify the potential deficiencies and how they are produced. Our findings reveal nine causal configurations that together explain deficiency as a consequence of multiple paths of interconnected mechanisms and contextual conditions that drive their actualization. Finally, based on a post-hoc analysis of 25 cases where no negative outcomes are reported, we discuss approaches for managing IS integration to avoid realizing the actualization of deficiencies.

Keywords: IS integration, Merger, Acquisition, Configurational perspective, Case Survey

1   Introduction

Mergers and Acquisitions (hereafter referred to as *mergers*[1]) are frequently undertaken by companies to create value through economies of scale and scope, by combining complimentary capabilities, or through corporate renewal. The difficulty of achieving expected benefits from mergers [19] has generated considerable research in several disciplines, including strategic management, marketing, and finance [12], and increasingly in Information Systems (IS) [11, 30, 31].

Between 45% and 60% of all merger benefits are directly dependent on effective IS integration [26]. While it is generally understood that post-merger IS integration strategies should be tailored to address specific strategic objectives, IS integration continues to be cited as a significant reason for acquisition failures. For example, in a survey by Accenture only 40% of 400 interviewed firms reported that their last merger-related IS integration had been 'successful' [1].

Apart from some very rare cases, merging companies will almost always arrive at some state of interconnected IS, but this does not mean that the outcome will achieve expected benefits. For example, unique IT-enabled business capabilities of the acquired firm might be lost in the desire to expedite IS integration by migrating the acquiring company's IS too rapidly [18, 20]. There are in fact numerous scenarios where deficiencies might arise. In this research we refer to these negative outcomes of IS integration *as post-merger IS integration deficiencies*.

Little is still known about how the negative outcomes of post-merger IS integration are generated. Tanriverdi and Uysal [30] established a link between the merging parties' capabilities for cross-business IS integration and the merger value creation, but beyond this high-level relationship, a theoretical explanation is limited for when and how merging companies' attempts to integrate IS inhibits value creation in the merger. There are also inconsistent findings for the link between IS integration strategy and merger outcome. Several papers conclude that matching organizational and IS integration strategies contributes to positive merger outcomes [18, 20, 33], yet Baker and Niederman [3] present evidence that contradicts this simple link. Thus, Tanriverdi and Uysal [30, p.146] argue for the need to "*better understand the conditions under which IT capabilities and IT M&A integrations create or destroy shareholder wealth in M&A*".

This paper presents a systematic analysis of the possible negative outcomes of post-merger IS integration and how they are produced. We first adopt a descriptive stance to address: *what are the possible*

---

[1] Regarding the distinction between "mergers" and "acquisitions", the literature frequently uses the terms "merger" and "post-merger" to cover both the merger of equals, and merger by acquisition in which the parties are non-equal in terms of their size and power. This paper uses the terms "Acquisition" and "post-acquisition" to emphasize that a particular situation involves a relevant power difference.

post-merger IS integration deficiencies? We then adopt an explanatory stance to address: *how are these deficiencies actualized?*

We explore these research questions from a configurational perspective of how an intervention brings about change [21, 22], and a re-analysis of 37 published case studies. We first identified possible IS integration deficiencies (negative outcomes) from our case sample. For each occurrence of an IS integration deficiency, we traced the contextual factors that contingently entailed a certain IS integration strategy (intervention) resulting in the deficiency. We then extracted the mechanism that explained the causal configuration.

This analysis yields a *post-merger IS integration deficiency taxonomy* that advances current knowledge on which negative outcomes are actualized in post-merger IS integration. The context-mechanism-outcome configurations that propose contingent deficiencies of IS integration strategies form a configurational perspective of post-merger IS integration, explaining outcomes as a result of multiple paths of interconnected contextual conditions and mechanisms [22].

Finally, we gained insights on tactics companies might use to manage contextual factors by revisiting 25 cases with no reported negative outcomes. Our configurational models and post-hoc insights provide guidance to merging companies on how to better assess IS integration deficiencies and their impact on merger outcomes, and can be used as a basis for countering the actualization of deficiencies when selecting and implementing IS integration strategies.

2   Theoretical Background and Research Framework

To develop our research framework, we first review the literature on post-merger IS integration. Four strategies used by merging companies are identified, and each strategy enables specific potential merger benefits. We argue that IS integration strategies are *multifinal*. Understanding how this multifinality comes about is essential to the understanding of deficiencies and how they can be avoided. Therefore, we introduce the configurational perspective as an analytical framework for studying the multifinality of post-merger IS integration strategies. Through this lens we propose the contingent causality of interventions as context-mechanism-outcome configurations. These configurations explain context-outcome variation through activating mechanisms that lead to different outcomes. Finally, we derive the research framework by conceptualizing the four post-merger strategies as interventions to leverage IT-dependent merger benefits.

2.1   Post-merger IS integration

IS integration has been described as an alignment process, where the IS integration strategy should follow the business benefits expected from the merger [18, 20, 28, 33]. Henningsson and Yetton [17] identify four generic strategies for post-merger IS integration, and explain how they combine the merging companies' IT resources to each enable a distinct merger benefit[2]. In *IS absorption*, data from one party's IS are migrated to the other party's IS, whereupon the first company's IS is retired. The strategy is useful when one of the merging parties can operate with the other party's IS without damaging the business and enable business process standardization and cost reduction [18, 33]. It allows for operational consolidations and enables economies of scale as the primary business benefits [17].

In *IS co-existence,* unique IS in the merging parties are retained. In full IS co-existence, all of the merging parties' systems are kept. In partial IS co-existence, only selected unique IS are retained separately and the rest of the systems are consolidated [18]. The primary business benefit of IS co-existence is economies of scope because IS co-existence allows for the retention of unique business processes (e.g. different manufacturing processes) while consolidating sales and marketing functions to cross-sell products and services from the merging parts [17].

IS best of breed is a strategy in which a careful evaluation is made of each of the merging parties' IS to select common systems for the combined organization. This is necessary when each company has some IS or IS-based business processes that are superior to the other company's IS and processes [18, 33]. Appropriately enacted, IS best-of-breed leads to business process improvement through cross-organizational redeployment of best practice [17].

IS renewal is necessary if neither of the merging companies' IS can support the combined organization. IS renewal, new IS have to be developed [20, 33]. An IS renewal strategy enables business transformation; for example, the repositioning of two differentiated niche businesses where the joint volumes allows them together to compete on cost leadership [17].

The four IS integration strategies do not always lead to the intended outcomes because they are contextually embedded and *multifinal*[3]. Tensions between the merging parties, employee dissatisfaction or management issues in the general merger process are likely to influence, and be influenced by, the IS

---

[2] Frequently a mix of IS integration strategies are required to enable all business benefits associated with a merger [39, 70]. This has implications for how we constructed our analysis. To determine the origin of a negative outcome in cases with mixed strategies, we back-traced and focused on the IS integration strategy that was portrayed as causing the specific outcome of interest.
[3] IS researchers are familiar with multifinality through an understanding of Systems Theory. The configurational perspective builds further on the view in systems theory that outcomes emerge by the interactions between elements in the system.

integration project. Given the presence of contextual factors, the same IS integration strategy can lead to different outcomes.

The multifinality can be illustrated by the different outcomes of two applications of the same IS integration strategy to address a similar situation. In the Danisco and Genencor merger, both companies presented business capabilities that were comparatively superior [34]. Therefore, it was decided to integrate the two companies with a IS best-of-breed strategy. The companies identified that Danisco's IT platform offered the greatest scalability, but replicated Genencor's supply chain and knowledge management systems on the Danisco platform. Genencor's related business processes became new standard practices throughout the combined firm.

In contrast, in the Commonwealth Bank of Australia and State Bank of Victoria merger [18] two banks also decided on an IS best-of-breed strategy to benefit from redeployment of the respective bank's strongest capabilities. The project was challenged by a politicized system selection process originating in clashes between the business departments that led to delays and the adoption of inferior IS. Eventually, under pressure from financial authorities requiring the transparency of one company and pressure from shareholders to start to realize the synergistic effects that motivated the merger, the banks decided to abandon the IS best-of-breed strategy for an IS absorption strategy. In the process, the bank destroyed the superior capabilities and retired the related IS in the bank that were migrated to the other platform.

Studies indicate that IS integration strategies frequently lead to some negative outcomes [16, 20, 29, 30, 32] such as the destruction of superior capabilities illustrated above. However, no systematic review of what these negative outcomes are or how they are produced exists. Therefore, in the following we use a configurational perspective to gain this understanding.

2.2   Configurational perspective

A key requirement for understanding the outcomes of IS integration strategies is to take heed of the layers of influencing factors and how they affect the outcome. A configurational perspective [10, 22] explains how an intervention brings about change by focusing on the deeper causal structures generating different outcomes. By understanding the link between an initiative and the effects it causes, it is possible to determine if the intended initiative is appropriate in a given situation and what challenges need to be overcome to arrive at the intended outcome.

The configurational approach is useful in complex social settings where it is difficult to establish lawful statements between variables. Within IS, the configurational perspective has been beneficial in studying complex causal processes with many interwoven variables that produce emergent outcomes, in-

cluding how organizations use IT to build a strategic advantage in turbulent environments [10] and the governance of open-source projects [9].

Four components are essential for a configurational analysis: mechanism, context, outcome and mechanism-context-outcome configuration. 'Mechanism' is the pivot on which the configurational analysis revolves [22]. The explicit focus on mechanisms in theory building is what differentiates the configurational analysis from other types of causal explanation that typically focus on establishing stable patterns between independent and dependent variables. In the configuration perspective mechanisms are the frequently hidden causal structures that generate observable events [4]. A mechanism is *"one of the processes in a concrete system that makes it what it is-for example, metabolism in cells, interneuronal connections in brains, work in factories and offices, research in laboratories, and litigation in courts of law"* [6, p. 182].

'Context' refers to the conditions under which certain mechanisms become actualized. Context describes those features of the conditions in which initiatives are introduced that are relevant to the mechanisms. A configurational approach does not lock onto a specific theoretical frame within which to find the contextual drivers. This multi-level explanatory framing is important as coinciding contextual factors can be found at different explanatory levels.

'Outcome' comprises the intended and unintended consequences of interventions. Typically, outcomes are not described by a single outcome measure to deliver a pass/fail verdict. Nor is there a hard and fast distinction between outputs (intermediate implementation targets) and outcomes (changes in the behavior targeted).
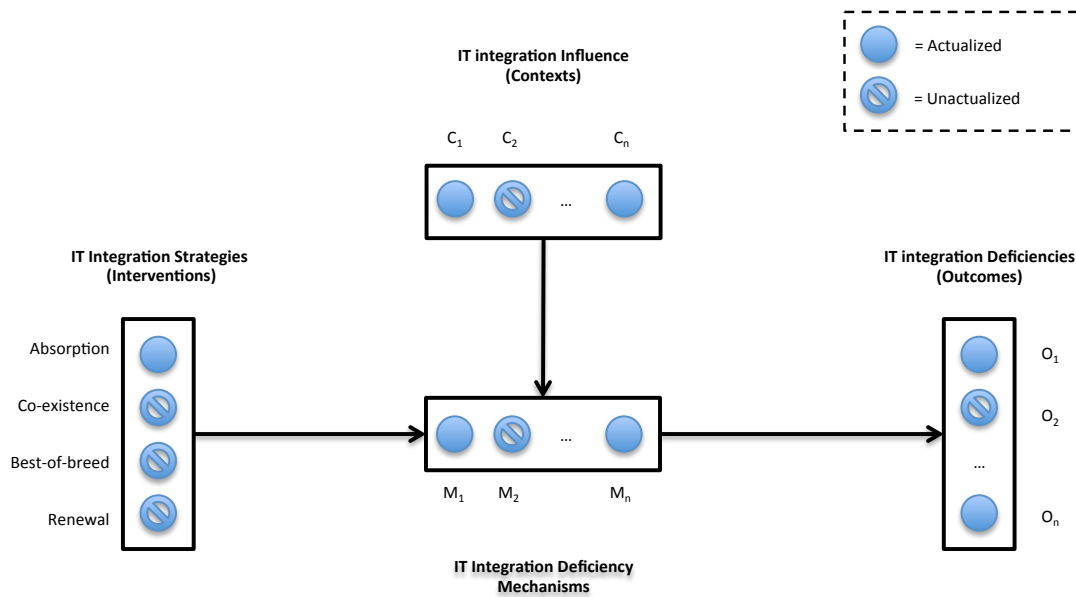
A 'context-mechanism-outcome configuration' is a specific combination of causal variables that generate an outcome of interest. The models are propositions that bring together mechanism-variation and relevant context-variation to predict and to explain outcome pattern variation [21, 22]. A configuration model should not be considered as a covering law, but as a conjectural explanation that is the basis of further refinement.

2.3   Research framework

Based on Pawson and Tilley's context-mechanism-outcome configuration, we develop the research framework for our configurational analysis (see Figure 1). We see IS integration strategies as the interventions that can be taken following a merger to consolidate IS. Four IS integration strategies form the set of possible interventions: IS absorption, IS co-existence, IS best-of-breed and IS renewal [33]. These strategies are subject to multifinality, meaning that in different situations they will lead to different outcomes. IS integration deficiencies are outcomes that if actualized can deviate the project from the an-

ticipated value creating end-state. These deficiencies manifest with the presence of certain contextual conditions. Contextual factors exert an influence by increasing the probability of an outcome. Following the configurational analysis approach [22], we do not limit contextual factors to any particular theoretical framework. IS integration strategies, contextual factors and deficiencies are contingently connected through IS integration deficiency mechanisms. These mechanisms refer to the events and states that under the influence of a set of contextual factors actualize a negative outcome.

Figure 1. A configuration research framework for IT integration deficiencies

Combinations of an IS integration strategy, contextual factors, deficiency mechanisms and deficient outcomes constitute IS integration deficiency configurations. Such configurations should be seen as conjectural explanations, because constant conjunctures are difficult to establish in complex social settings. Directed management efforts or abnormal organizational events (bankruptcy, illness, etc.) may distort the outcome pattern.

3   Method

The configurational perspective is rooted in a critical realist philosophical approach [4]. Theoretical approaches adhering to critical realism build on the consolidation of causal analysis to form an explanatory mechanism. Configurational analysis starts with a set of cases of a particular family, which

have some similarities and some differences. It is assumed that the differences are brought about by the action of some underlying mechanism. Published cases provide a sufficiently large sample to identify recurring patterns between instances, while at the same time provide rich enough data to abstract the logic of causal mechanisms [13]. In analyses that focus on establishing constant conjunctions, these mechanisms are often 'masqued' [13]. Re-analyzing the cases with a focus on the mechanism may reveal new patterns of regularities.

Our method for case selection (see Table 1) largely conformed to the study designs by Henfridsson and Bygstad [13] and Rivard and Lapointe [24]. We collected a large sample of post-merger IS integration cases from scholarly sources and refined the initial sample using inclusion and exclusion criteria [35]. The initial sample included 76 cases of post-merger IS integration. The inclusion criteria were: (1) that the case narrative provided sufficient data to uncover the outcome and causal configuration of the IS integration project and (2) that the case documented some post-merger IS integration deficiencies. Subsequently, 14 cases were excluded as they did not present rich enough case narratives, and 25 cases were excluded because they did not report important deficiencies (see Table 1). Our final sample included 37 cases (see Appendix A) that covered a variety of industry settings and both mergers of equals and acquisitions.

Table 1. Case selection		
Step	**Output**	**Description / Example**
1. Case solicitation	A sample of 76 cases, including journal articles, peer-reviewed conference papers, book chapters, and working papers (See Appendix A).	The first step of the process was to collect published post-merger integration cases through scholarly sources. Specifically, this step included a keyword search in scholar databases, forward and backward tracing, as well as internal inquiries within the researchers' network.
2. Case filtering	Rejection of 14 cases lacking sufficient information for analysis. 62 cases remaining.	The second step excluded cases with lacking information for the analyses, including information about IS integration strategy (1 case), outcome (10 cases), or casual mechanism (3 cases) (see Appendix A). - For example, in the merger of *Corporate Y* and *Corporate Z*, the narrative identifies a deficient outcome of the IS renewal strategy that was applied, but has insufficient information concerning the contextual factors.

Table 1. Case selection

Step	Output	Description / Example
3. Case sorting	Sorting of cases into deficiency cases (37 cases) and non-deficiency cases (25 cases).	The third step grouped 62 qualified cases from the filtering step into the categories of *deficient* and *non-deficient*, based on the integration outcomes identified. This classification resulted in 37 deficient and 25 successful cases (see Table 2 for coding in this step). - For example, in the *Mekong-Indus* case, we identified a deficient outcome of *overspending due to re-do*, as Mekong's older system was first adopted to avoid costs of implementing Indus' newer version, but ended up doing this transition a few years later, thus facing the integration costs twice. This is illustrated via the following excerpt: "*Finally, the integration team chose to adopt Mekong's more dated ERP version rather than face the risk and delays in moving Mekong's larger data set and processes to Indus' newer ERP version with new accounts payable and product revenue capabilities. However, a couple of years later, they upgraded to the newer version*".

The cases were coded and analyzed with qualitative data analysis software in four phases. An overview of the coding process and examples of coding is presented in Table 2. The full list of codes and coding categories can be found in Appendix C. We first coded the post-merger IS integration deficiencies. We marked texts pertaining to deficient outcomes with initial outcome codes, which were grouped into outcome categories by two researchers following the constant comparison method [27]. Second, we linked outcomes to intervention and context. We used the four IS integration strategies as coding categories for intervention, and sorted the emerging codes into categories. Then we coded the context similar to how we coded outcome. The third step of coding focused on the mechanisms linking intervention to context and outcome. This phase of analysis followed the main steps of configuration mechanism generation as described by Bygstad et al. [7]. We started by open coding to identify key events. Using the codes, two researchers coded and created the preliminary mechanism accounts independently. Similar to Henfridsson and Bygstad [13], to assess the candidate mechanisms we used backwards chaining, going from outcome to intervention, and forwards chaining, from intervention to outcome [23]. In this way we arrived at a mechanism that constituted a plausible proposition for how the components linked together in each case. Finally, we made a cross-case comparison of the identified mechanisms to reveal similarities and differences. We contrasted the mechanisms' attributes (intervention, context and outcome) to sort them by the similarities. Among the seemingly similar mechanisms, we compared the mechanism's workings to form overlapping patterns and found repetitions that allowed us to cluster the 37 instances into nine deficiency mechanisms.

Table 2. Data analysis

Steps	Output	Example
Phase 1: IS integration deficiency identification		
a. Initial coding, marked texts associated with the outcome theme and added initial outcome codes. This step followed a constant comparison method [27]. b. Clustering into outcome categories by two researchers working together, following the constant comparison method.	Identification of 13 deficiency outcomes grouped in 6 IT integration deficiency outcome categories	a. We read the cases and marked sections describing outcomes that illustrate deficiencies. For example, in the *Hospital A-Hospital B* case, we marked: "*Extra investments were needed and even then, integration options are limited as the two locations still need to maintain their own IT*" as it points out a deficiency outcome. This process resulted in 70 sections highlighting deficiency outcomes. b. These sections were then associated with specific labels to provide a short explanatory description, using the constant comparison method; e.g., the above deficiency section from the *Hospital A-Hospital B* case was labeled as "*Integration overspending due to process inefficiency*". This resulted in 13 unique deficiency outcome labels. c. The labels were grouped in more general categories; e.g., the label in step b. was grouped under a category called "Integration Overspending". This process resulted in 6 unique deficiency outcome categories.
Phase 2: Linking IS integration strategy and contextual factors		
a. Association of cases to IS integration strategy to code intervention. b. Initial coding of contextual factors and clustering into context categories.	IS integration strategies and 5 IS integration contextual factor clusters	a. In this step, every case was associated with an IT integration strategy (IS absorption, IS co-existence, IS best-of-breed, IS renewal). For example, the *Seine-Lena* case was associated with IS absorption, as supported by the following section: "*a decision was made to move Lena to Seine's infrastructure and standardize Lena's desktop to match Seine's environment*". b. Similar to phase 1, we marked the sections within the narrative describing contextual factors for the cases. For example, in the *Dyrup-Marlfarb* case, we marked the following section: "*The fact that Dyrup's factory was located in one of the largest cities in Poland while Malfarb's activities were located in a Polish rural area gave rise to certain discrepancies between the two organizational cultures*" as it points out to a contextual factor. This process resulted in 61 sections highlighting contextual factors. We associated the marked sections with specific labels in order to provide a short explanatory description, using the constant comparison method; e.g., the above excerpt from *Dyrup-Malfarb* was labeled as "*Cultural differences*". This process resulted in 11 unique contextual factors. These labels were grouped under more general categories providing more comprehensive descriptions. For example, the labels presented in step c. were grouped under a common category called "*Socio-technical differences*". This process resulted in 5 unique contextual factor clusters.
3.1.1 Phase 3: Retroduction of case-specific mechanisms		
a. Open coding to identify key events b. Using the codes, development of preliminary accounts for each case.	37 case-specific deficiency mechanisms	a. In the first step, we revisited the cases searching for descriptions of events that played key roles in the respective deficiency outcomes. For example, in the *Mekong-Indus* case, the narrative describes that even though Indus had a newer system, the team decided to avoid risk and delays by moving to it, and adopted Mekong's older system. However, the system was later upgraded to a newer version. This key event is illustrated in the following section: "*...the integration team chose to adopt Mekong's more dated ERP version rather than face the risk and delays in moving Mekong's larger data set and processes to*

Table 2. Data analysis		
Steps	**Output**	**Example**
		Indus' newer ERP version with new account payable and product revenue capabilities. However, a couple of years later, they upgraded to the newer version". b. We then aimed to develop preliminary accounts, through the creation of short summaries describing in what context the key events led to the deficiency outcomes for each case. The summaries for the 37 deficiency cases can be found in Appendix D.
3.1.2 Phase 4: Cross-mechanism comparison and abstraction		
a. Cross-mechanism attribute comparison b. Mechanism clustering c. Backwards and forwards chaining	9 general deficiency mechanisms	a. This step included the comparison between the different identified mechanisms in order to reveal similarities and differences among them. For example, the identified contextual factors and outcomes in the *Mekong-Indus* case were similar to the ones concerning the *Seine-Lena* case. Both cases are identified by operational differences as well as external time pressure and decided to adopt an IS absorption strategy considering it as the most cost-efficient solution. b. Following this comparison, for cases presenting similar strategy-context-outcome attributes, we contrasted the unique mechanisms to abstract generic explanations for workings (mechanism) of the configuration. This led to 9 general deficiency mechanisms. For example, the *Mekong-Indus* and *Seine-Lena* cases are both grouped under the mechanism called "IT-based capability destruction" as their attributes and mechanisms are corresponding. The descriptions and relevant cases for each mechanism can be found in Appendix B. c. Finally, we used backwards chaining, going from outcome to intervention, and forwards chaining, from intervention to outcome to verify the explanatory power of the general mechanisms for each case it was supposed to explain.

4   Findings

We present the findings of our case survey in two steps. First, focusing on the nuances of post-merger IS integration deficiencies we propose a taxonomy that comprises six deficiency categories and details 13 specific IS integration deficiencies. Second, we present the configurations that contingently explain how these deficiencies were actualized in the case material.

4.1   A taxonomy of post-merger IS integration deficiency

Six categories of negative integration outcomes were identified: *business inefficiencies, business disruption, unrealized potential, staff reaction, delay,* and *overspending*. Table 3 summarizes the negative outcomes, and also presents the sub-categories for each outcome category, the relative frequency of the outcomes, and the specific cases where we identified the outcome.

Table 3. A taxonomy of post-merger IS integration deficiencies

Deficiency category	N	Deficient outcome	N	Description	Cases
Unrealized potential	22%	Unrealized cost synergies	5%	Lack of materialization of potential IT-dependent cost synergies	#14: Company X - Company Y #16: Dyrup - Plus Paint
		Unrealized business process improvement	5%	Lack of materialization of potential to cross-deploy superior IT-enabled business processes	#15: Danisco – Cultor #17: Fagor-Ederlan - Brazilian Comp
		Unrealized transformation potential	12%	Lack of materialization of potential to reposition business strategy	#22: Airline X - Airline Y #23: Alpha - Beta #25: FinCo A - FinCo B #37: Teaching Health Center
Business inefficiencies (lasting)	27%	Operational	8%	Replacing unique/critical IS may limit value of merger	#1: Company A - Company B #2: First Union - Core States #4: Seine - Lena
		Governance	8%	Introducing asymmetries in responsibilities that hampers decision making and transparency	#20: Hokatex – Rentokil #21:Peninsula - Cape #37: Teaching Health Center
		Agility	11%	Decreasing the ability to respond to business threats and opportunities	#18: Global Medical - Health Tech #19: H Group - Company A #20: Hokatex - Rentokil #21: Peninsula - Cape
Business disruption (temporary)	30%	Innovation stagnation	8%	Inability to engage in IT-enabled business innovation during the post-merger IS integration project	#28: CBA – SBV #30: Oracle - Sun #31: Org D - Org E
		Operational disruption	22%	Decrease in business performance during the post-merger IS integration project	#6: Dyrup – Malfarb #8: Matcom - Syscom #9: Refining Acq. - Refining Target #32: HP - Compaq #33: PackCo 1 - PackCo 2 #34: PrintComp - P1 #35: Shipping Co A - Shipping Co B #36: Smallville - Greatville
Staff reaction	30%	Demoralization	27%	Emotionally distressed employees	#6: Dyrup - Malfarb #7: Fubon FHC - Bank of Taipei #9: Refining Acq. – Refining Target #18: Global Medical - Health Tech #19: H Group - Company A #22: Airline X - Airline Y #23: Alpha - Beta #24: Amazon - Nile #35: Shipping Co A - Shipping Co B #36: Smallville – Greatville
		Exhaustion	3%	Exhausted and overwork employees and managers	#34: PrintComp - P1

Table 3. A taxonomy of post-merger IS integration deficiencies

Deficiency category	N	Deficient outcome	N	Description	Cases
Delay	38%		38%	Business benefits are slowed because of issues in IS integration process	#3: Mekong - Indus #5: Trelleborg - Kleber #10: Dyrup - Hygaea #11: Fagor-Ederlan - Victorio L. T. #12: Int Telecom X - Reg Telecom Y #13: MuXi - OldTech #23: Alpha - Beta #24: Amazon - Nile #25: FinCo A - FinCo B #26: Hospital A - Hospital B #27: BP - Amoco #28: CBA - SBV #29: Ficosa - Magnetti-Marelli #31: Org D - Org E
Integration overspending	30%	Re-do	14%	IT integration may be achieved, but at high cost due to the need to re-do steps in the integration process	#3: Mekong - Indus #5: Trelleborg - Kleber #13: MuXi - OldTech #27: BP - Amoco #28: CBA – SBV
		Process inefficiency	16%	IT integration may be achieved, but at high cost due to an inefficient process	#10: Dyrup - Hygaea #12: Int Telecom X - Reg Telecom Y #23: Alpha - Beta #24: Amazon - Nile #25: FinCo A - FInCo B #26: Hospital A - Hospital B

Business inefficiencies refer to lasting damage to the combined organization following a merger process. This includes operational inefficiencies as a result of eroding capabilities, agility inefficiencies following an overly complex IT infrastructure, and governance inefficiencies through structural arrangements of IT resources that inhibit effective decision-making.

Business disruption refers to temporary disturbance during the merger project that either made the merging organizations unable to perform the daily operations or required so much managerial attention and development resources that all other IT-based innovation became stagnant. Here, we refer to clearly abnormal business disruption caused by issues in IS integration. Disruptive effects included being unable to invoice for six months and as a consequence losing 25% of the customer base, and a three-year freeze on new IT development.

Unrealized potential is possible merger benefits that never materialize because of some deficiency in the IS integration. The case material presented episodes where economies of scale, business process

improvement and transformational potential remained unrealized post-merger because the IS integration did not enable them.

Staff reaction is a deficiency category of prevailing negative impact on the staff in the merging organizations. Similar to business disruption, some negative impact can always be expected, but case examples described abnormal impact in the form of demoralization and exhaustion demonstrated through the refusal to adopt new systems, workarounds to retain pre-merger practices, high staff turnover and high sick-leave rates. Staff reaction as a negative outcome should not be confused with user resistance, a component of the contingent explanation of why some other negative outcomes actualize (e.g. delay).

Delay refers to postponement of merger benefits because of IS integration. Delay in the realization of business benefits means that there is a longer period without returns on financial investments in the merger. One extreme example reported in a case was that full business synergy realization was delayed as much as ten years because of issues in IS integration.

Overspending is achieving IS integration with more resources than necessary. Two forms of overspending were identified. One was an inefficient process in which different forms of interim solutions made the total integration cost higher than necessary. The second was the need to redo IS integration, as the first attempt did not lead to realizing the merger potential.

4.2   Causal configurations explaining deficient outcomes

To explain the causality of IS integration deficiencies, we present nine configurational models that link an IS integration strategy to different negative outcomes (Figure 2). Each deficiency configuration unfolds through a unique mechanism. The mechanisms are actualized under the influence from five groups of contextual factors: *time pressure, integration extent, merger unreadiness, socio-technical differences* and *power balance*. The configurations, mechanisms, outcomes and influencing contextual factors are summarized in Table 4 and displayed in Figure 3. Appendix B describes the configurations and how they unfolded in the supporting cases.

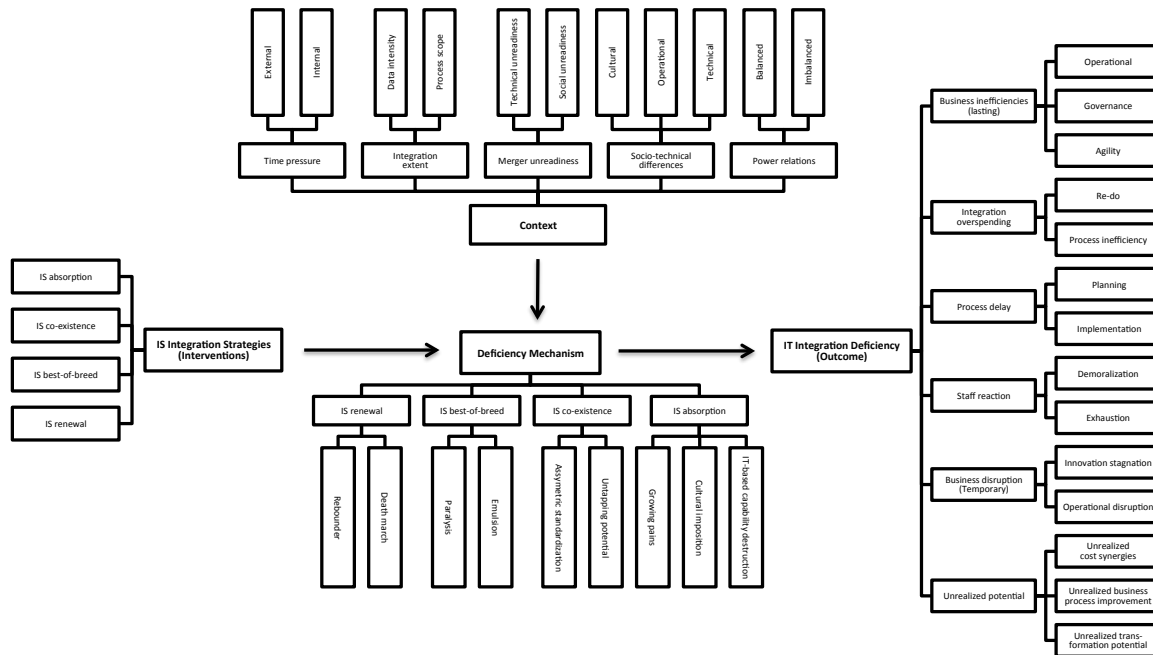**Figure 2. Intervention, outcome, context and mechanism**
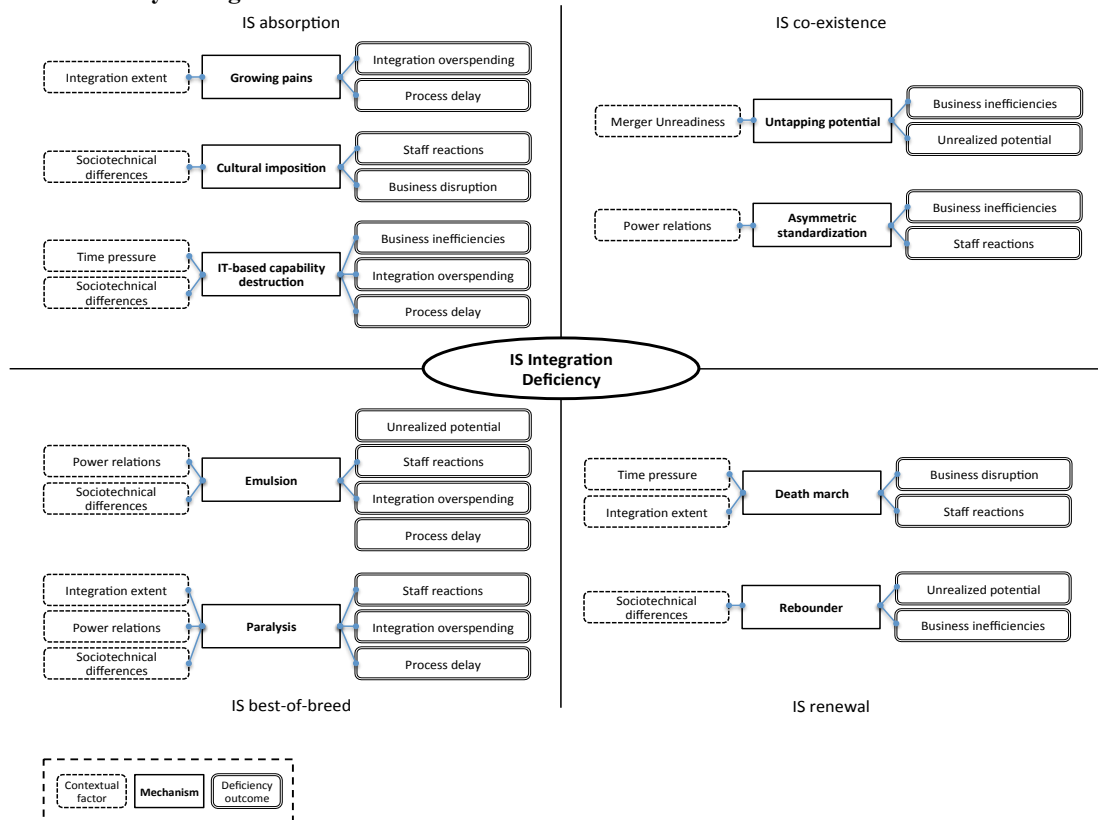

Figure 3. Deficiency configurations

Table 4. Deficiency configurations				
Cfg	**Deficiency**	**Contextual factors**	**Mechanism**	**Cases**
Absorption				
A1	- Business inefficiencies (operational) - Integration overspending (re-do) - Process delay	- Time pressure (external, internal) - Socio-technical differences (operational)	- IT-based capability destruction	#1: Company A - Company B #2: First Union - Core States #3: Mekong - Indus #4: Seine - Lena #5: Trelleborg – Kleber
A2	- Staff reaction (demoralization) - Business disruption (operational)	- Socio-technical differences (culture)	- Cultural imposition	#6: Dyrup –Malfarb #7: Fubon FHC - Bank of Taipei #8: Matcom - Syscom #9: Refining Acquirer – Refining Target
A3	- Process delay - Integration overspending (process inefficiency)	- Integration extent (data intensity, process scope)	- Growing pains	#10: Dyrup - Hygaea #11: Fagor-Eder. - Victorio L. T. #12: Int. Telecom X – Reg. Telecom Y #13: MuXi – OldTech
Co-existence				
B1	- Unrealized potential (cost synergies, business process improvement) - Business inefficiency (agility)	- Merger unreadiness (change, technical)	- Untapping potential	#14: Company X - Company Y #15: Danisco – Cultor #16: Dyrup - Plus Paint #17: Fagor-Ederlan - Brazilian Co
B2	- Business inefficiencies (governance, agility) - Staff reactions (demoralization)	- Power relations (balanced, unbalanced)	- Asymmetric standardization	#18: Global Medical - Health Tech #19: H Group - Company A #20: Hokatex - Rentokil #21: Peninsula – Cape
Best-of-breed				
C1	- Unrealized potential (transformation) - Staff reactions (demoralization) - Process delay - Integration overspending (process inefficiency)	- Power relation (balanced) - Socio-technical differences (operational, cultural)	- Emulsion	#22: Airline X - Airline Y #23: Alpha - Beta #24: Amazon - Nile #25: FinCo A - FinCo B #26: Hospital A - Hospital B
C2	- Process delay - Integration overspending (re-do, process inefficiency) - Business disruption (innovation stagnation)	- Socio-technical differences (cultural, operational, technical) - Integration extent - Power relations (balanced)	- Paralysis	#27: BP - Amoco #28: CBA - SBV #29: Ficosa - Magneti-Marelli #30: Oracle - Sun #31: Org D - Org E
Renewal				

D1	- Business disruption (innovation stagnation, operational disruption) - Staff reaction (demoralization, exhaustion)	- Time pressure (external, internal) - Integration extent (data intensity, process scope)	- Death march	#32: HP - Compaq #33: PackCo 1 - PackCo 2 #34: PrintComp - P1 #35: Shipping Co A- Shipping Co B #36: Smallville – Greatville
D2	- Unrealized potential (transformation) - Business inefficiencies (governance)	- Socio-technical differences (cultural)	- Rebounder	#37: Teaching Health Center

4.2.1   IS absorption deficiency configurations

An IS absorption strategy standardizes the two merging companies' business processes based on one company's IS [30, 33]. Data from the absorbed company is migrated to the other company's IS to support the standardization. We identify three deficiency configurations, each associated with a particular mechanism, that explain the realization of deficiencies when employing an IS absorption strategy. These mechanisms all relate to a mismatch during the 'conversion' (socially and technically) of the absorbed company to the IS of the absorbing company.

- **Configuration A1: IT-based capability destruction**

In this configuration, the IS absorption strategy is applied in a situation where it does not match the merger potential. IS absorption is considered the fastest and most predictable way to arrive at integrated IS [20, 30]. However, at the time of the acquisition it may be difficult to determine the actual value of IT resources [8]. If there are unique IT-based business capabilities in the absorbed organization, these will be eroded as a consequence of the IS absorption [30]. The outcome is a reduction in business capabilities. The mechanism, *IT-based capability destruction*, means that standardization of business practice based on common IS follows an IS absorption strategy. Consequently, a unique capability in the absorbed business may be lost. In the reviewed cases, this happened because of high time pressure forcing the merging parties to rush the integration, ignoring the destructive effects of the IS absorption.

The configuration is visible in five cases. Three of them completed the IS absorption strategy, which led to value destruction. In the First Union-Core State merger, the major time pressure came from shareholders. Here the IS absorption also meant a loss of the customer-focused retail banking. Similarly, Siene-Lena pushed through an IS absorption based on Siene's IS that imposed constraints on Lena's pre-merger flexibility. Finally, when Company A and Company B merged, the capability that was lost was Company B's highly innovative business development function that was based on an agile and flexible

ERP system. In all cases, there is evidence (loss in revenues, customer dissatisfaction) indicating that the loss of these capabilities meant that the absorbed units lost important capabilities on which they were competing.

In two cases, the strategy was aborted when management realized the problems it would cause. In the Mekong-Indus merger, shareholder pressure pushed the dominant party, Mekong, to decide to standardize the businesses based on their IS. More particularly, Mekong's desire to achieve economies of scale, combined with the increased time pressure and their risk aversion towards the process of migrating to Indus's system, led them to disregard the latter. However, this strategy was later aborted and the company finally decided to switch to Indus's newer and more comprehensive ERP system, which could more effectively meet the company's needs. Similarly, in Trelleborg's acquisition of Kléber, Trelleborg's management decided to grow a merged business by absorbing Kléber into their IS. However, Trelleborg's IS was designed for a local, niche business whereas Kléber was a more international low-cost business. Trelleborg's management recognized too late that the selected strategy was inappropriate and the project was sent back to the drawing board.

- **Configuration A2: Cultural imposition**

IS absorption inevitably means that the absorbed organization needs to adopt a new set of IS [18]. Along with these systems comes the organizational culture that is embedded in the IT-enabled business processes [2, 5]. If there is a strong difference in organizational culture between the merging companies, the Cultural imposition associated with these new ways of working can lead to a sense of lost independence and eventually demoralization of the absorbed staff. It also leads to a period of business disruption while staff in the absorbed organization actively resist adoption of the new systems as well as struggle to perform their tasks in the new environment.

Four cases illustrate the workings of Cultural imposition. When Dyrup merged with Malfarb, Dyrup was a pan-European company and Malfarb a small, independent company in rural Poland. Imposing the advanced ERP system of Dyrup on Malfarb significantly impacted work organization at Malfarb. Malfarb employees struggled with the adoption of the new systems, which they also actively resisted because of the way in which they would change their daily work, imposing for example much more rigid mechanisms for output control and behavioral monitoring. As a virtual organization, Syscom had a more flexible and decentralized style that was reflected in the company's operations, whereas Matcom was a traditional brick and mortar company, having adopted a stricter approach in its respective field. As a result, implementing Matcom's systems in Syscom led to increased complexity within the merged organization. The new processes were inadequate to satisfy both companies' needs, thus leaving the acquired staff

disoriented and finding it hard to adapt. Similarly, Fubon FHC and the Bank of Taipei had considerable differences in their approaches. Namely, Fubon FHC had a more flexible and customer-oriented IT strategy, whereas the Bank of Taipei regarded IT as an efficiency enabler instead of a differentiation driver. In this context the conflict between the two companies was evident during the integration, resulting in disagreements and delays that were resolved by advanced change management techniques. Finally, the Refining Acquirer and Refining Target had considerable cultural differences, particularly with regards to IT staff, who were considered as 'business specialists' in one company and 'technicians' in the other. Despite that they both used SAP before the merger, the absorbed company's staff had to undergo extensive acculturation to be operational in the new context. Operational disruptions included process delays.

- **Configuration A3: Growing pains**

Even if IS absorption is considered the technically least complex and the least resource demanding integration strategy, the migration of data from one system to another is still very resource-demanding [15]. The cases revealed that under the condition of high integration (high data intensity and process scope), the acquirer can make unrealistic assumptions about the resources needed to complete integration. Lack of resources slows the integration and, ironically, it becomes more expensive. Growing pains occur because the merging organizations need to develop temporary transition solutions that allow for joint financial reporting and funding to keep the redundant systems operational. This also delays the realization of business benefits.

In four cases of high extent IS absorption the project was unrealistically resourced. In the Dyrup-Hygaea merger, first-time acquirer Dyrup underestimated the resources needed for data conversion and migration. As a consequence it needed to keep the redundant system alive while integrating IS in a temporary IS co-existence solution. Similarly, the acquisition of Victorio Luzuriaga by Fagor-Ederlan had an IS integration process that lasted more than a year, mainly because the target had an established ERP which was operating in a satisfactory way. As a result, the transition was slow and gradual to avoid the disruption that might arise due to an abrupt change. In OldTech's MD SBU merger with MuXi, the IT aspects were not formally specified in the merger contract, leaving the responsible parties unguided which led to confrontation during the negotiations. In the end, they both had to redo the whole process, resulting in delay and additional costs. Finally, when International Telecom Ltd acquired Regional Telecom Ltd, the fast preparation for the IS integration was characterized by an insufficient understanding of the complexity and led to an inadequate resource allocation. This caused delays and inefficiencies during the implementation process concerning software installation and data migration.

4.2.2 *IS co-existence deficiency configurations*

The IS co-existence strategy leaves the IS of the merging companies running fully or partly in parallel [14]. Standardizing and streamlining too much to save costs results in critical and/or unique IT-enabled business capabilities being forgone (see above: Capability destruction). Alternatively, standardizing too little is not desirable because then some synergies remain unactualized [18]. Two deficiency configurations had mechanisms related to finding the right balance between what to standardize and what to keep separate in IS co-existence strategies; one standardized too little, the other had asymmetric standardization of IT and business processes.

-   **Configuration B1: Untapping Potential**

If an IS co-existence strategy is applied to a merger with business process overlap, the merger potential remains unrealized [3]. It is required when the merging organizations cannot be supported by the same IS. However, it is also a strategy used when an IS absorption or IS best-of-breed strategy should have been employed but one party is considered unable to change to the other organization's IS. At first sight, such arrangement displays few signs of failure. However, closer scrutiny shows the strategy is not tapping potential in economies of scale due to redundancy in IS (several systems supporting similar business processes). In addition, adding systems and interfaces between the systems leads to IT complexity, which is both costly and reduces agility.

When Danisco merged with Cultor, Cultor was integrated with a IS co-existence strategy. Since they both had many similar processes that could have been standardized on the same IS, the strategy introduced IT redundancy. Similarly, the merger between Company X and Company Y introduced redundant IS and failed to produce potential economies of scale. This also occurred when Fagor-Ederlan and Brazilian Co merged. Brazilian Co had just been through a large ERP implementation and going through an IS absorption process was considered too distressing. This might have been true, but the strategy led to unrealized possible economies of scale. With Dyrup-Plus Paint, part of the arrangement was that Plus Paint should remain an independent unit. Thus, Dyrup could not enforce IS absorption and economies of scale could not be realized.

-   **Configuration B2: Asymmetric standardization**

In partial IS co-existence, some IS in the merging parties are kept separate as they are considered unique. The critical balance that needs to be struck is matching the business unit's independence with IT decision rights [17]. The cases reveal that if the partial IS co-existence incorporates Asymmetric standardization with respect to standardization levels in business processes and IS, the merged organization will

suffer from operational inefficiencies and, in turn, demoralization of frustrated staff who cannot perform their tasks with the given systems. Because the innovation decisions are dislocated, business agility is also inhibited.

In the Hokatex-Rentokil merger, the partial IS co-existence strategy meant that the merging companies were to keep some of their unique IS. However, all IS was organizationally centralized. This led to an imbalance in decision-making, whereby the business unit did not control IS development related to its business decisions. As the acquirer, H Group was the leader in the integration processes with Company A, but did not take into account the differences between their procedures and Company A. As a result, the staff had difficulties in adjusting to the new situation and even asked to go back to the old system. When Health Tech merged with Global Medical, a giant in healthcare in the US, they were struggling to survive within the ominous financial environment. The integration was carried out in a form of partial IS co-existence; however, Health Tech's staff faced difficulties adapting to Global Medical's systems when necessary. Inadequate training and their resistance to change led to further difficulties in adjustment, which were finally translated as inefficiencies and high dissatisfaction from employees. Finally, in the merger between Peninsula and Cape Technikon, a co-existence strategy was chosen due to the cultural and organizational differences between the institutions. However, unpreparedness for the merger caused significant delays and major operational disruption.

4.2.3   IS best-of-breed deficiency configurations

In IS best-of-breed strategies, the merging companies have to agree on the selection of IS to share after the merger. Because IS are socio-technical, the selection of IS also implies a selection on how to work. The two deficiency configurations associated with the IS best-of-breed strategy require agreement on significant changes in business practices to be effective. Unfortunately, this puts the integration strategy in question resulting in a rethinking to keep pre-merger practices and prevent depoliticized decision-making.

- **Configuration C1: Emulsion**

An IS best-of-breed approach means that IS from both of the merging organizations are combined into a shared systems bundle [17]. The cases show that despite ambitions to combine IS, the different technical and social components do not blend well. If the two organizations display incommensurability in social and/or technical dimensions of the IS, they will initially blend as emulsions. Instead of seamless mixtures, they form combinations in which the different socio-technical components prevail. When the blend is not actively upheld the socio-technical components separate back into the pre-merger constella-

tions, displayed through workarounds to retain business process, lack of adoption, slow implementation process and cost associated with retaining the blend. A contextual condition for emulsion is power balance, because without a relatively even power balance between the merger partners, one dominant actor is likely to take over.

Five cases display examples of the emulsion mechanism. In the merger of Airline X and Airline Y, the IT functions were co-located with the objective of standardization and cost savings. However, both airlines retained their existing practices and system customization. In the Alpha-Beta merger, the speed of the decision-making process and the significant cultural and operational differences made the implementation of a IS best-of-breed strategy a very complex process. The gap between the companies required cross-training and led to delays as well as undesired staff reactions. In the end, the planned benefits from synergies were not realized. FinCo A and FinCo B's decision to go for a IS best-of-breed strategy resulted as delay and staff uncertainty about the correctness of the steps taken, since neither of the available systems was adequate for the merged organizations' needs. Finally, in the Amazon-Nile merger, it was decided to implement some of Nile's systems to benefit from their unique capabilities, but the decision to adapt them to Amazon's particularities caused delays and complexity that was only resolved by finally aborting the selected Nile systems. In the Hospital A-Hospital B merger, the extent of cultural differences between the two hospitals prevented a successful integration resulting in a lengthy process of reinvestment in separate IS, as the two hospitals insisted they needed to maintain their own IS.

- **Configuration C2: Paralysis**

Selecting the systems to use in a best-of-breed strategy can become a highly politicized process with struggles for control over the process [18]. Selecting a specific system inevitably means choosing a particular way of working and giving power to certain individuals [25]. Several cases displayed IS best-of-breed strategies that became stuck, causing delays in realizing business benefits and overspending. This can be explained through a Paralysis mechanism that is contingent on a fairly even power balance, where the system selection becomes a tedious process of working out best practice with both organizations wanting to retain their current practices. Delays caused by these clashes are further exacerbated by technical complexity in implementation. The extent of integration is an important contextual condition; one case resolved the deadlock by limiting the IS best-of-breed strategy to retain one specific system in one of the organizations.

In two of the cases that illustrate the Paralysis of IS best-of-breed strategies, the issue was eventually resolved through the dominant actor enforcing selection. In the CBA-SBV merger, the system selection process became the battleground for deciding organizational practice. In the BP-Amoco case, ini-

tial Paralysis was the result of the companies failing to find grounds for selecting systems. Eventually, these deadlocks were addressed by the dominant partners' (CBA and BP) use of their relative power size to enforce system selection. In the Ficosa-Magneti-Marelli merger, the integration process was very slow and resource demanding. In the Oracle-Sun merger, the balanced power relations between the parties made the planning process challenging. Operational disruptions as well as customer losses resulted and the intended innovation potential of the merger was not realized. Finally, in the merger of Org D and Org E, even though the staff was positive towards the integration, the companies proved unprepared to perform the necessary transformations, leading to innovation stagnation, delays and staff reactions.

4.2.4   IS renewal deficiency configurations

IS renewal implies the development of new IS to support the combined organization, partially or fully [14]. New IS development to allow for competition in a new way, the underlying reason for an IS renewal strategy, is a highly explorative task [18, 20]. Two deficiency configurations in the case material relate to difficulties with steering the exploratory new development of IS towards enabling strategic transformation of the merging organizations.

- **Configuration D1: Death march**

When an IS renewal strategy is pursued under time pressure and with high integration it can lead to devastating outcomes. Time pressure forces the merging organizations on a Death march, speeding through development and implementation, and the adoption of a new system that is not ready to support the combined organizations. Adopting unfinished systems leads to significant business disruption, illustrated by difficulties in performing work tasks, loss of customers and decreased sales. Such turbulence also has a significant demoralizing effect on the staff who have to work with the unfinished system.

Five cases illustrate the Death march mechanism. When Shipping company A and Shipping company B merged neither company's IS could support the combined organization, therefore an IS renewal strategy was chosen. Rushing through the development to meet the shareholders' expectation to deliver merger benefits, the company eventually adopted an unfinished system. For more than six months the company could not send invoices and eventually lost 25% of its global market share. Similarly, in the PrintComp-P1 merger there were signs of pressure to materialize merger benefits. The company adopted an immature system, full of software bugs and poorly suited to the printing company's work processes. They managed to fulfill orders despite the turbulence, but an exhausted and demoralized staff seems to be an important negative outcome. In the merger of PackCo 1 and PackCo 2, planning and implementation was carried out in a short time period, led by a newly assigned manager who was not involved in the ini-

tial acquisition process. These factors led to insufficient resource allocation and subsequent business disruption that resulted in disinvestment of the acquired packaging company. The HP-Compaq merger failed to complete comprehensive planning that eventually resulted in problems with the implementation of the new SAP system. Complex data modeling issues caused considerable inefficiencies and financial losses. Similarly, in the merger of Smallville and Greatville, the staff considered integration efforts inadequate and the result was delays and operational disruptions.

- **Configuration D2: Rebounder**

An IS renewal strategy is an opportunity to introduce improved ways of working [3]. However, transformational potential can get lost in the implementation process. The explanatory mechanism of the Rebounder is that the implemented system becomes a combination of the transformative design and the merging organizations' pre-merger practices. This mechanism is contingent on differences in organizational identity that pull the design apart. The consequence is that transformational potential gets lost in the implementation.

The IS renewal strategy for the Teaching Health Center was limited to a new laboratory system. The initial design for a radical transformation of the business processes was altered during the planning phase when the pre-merger practices 'rebounded' to become an important component of the redesigned IS. Thus, the renewal project had unrealized transformational potential.

5 Avoidance of Negative Outcomes

Avoiding negative outcomes is possible if organizations first recognize the varying impact of the negative outcomes. Estimating the possible impact of each negative outcome for a given merger is an essential part of the pre-merger assessment and selection of an IS integration strategy. Secondly, once an IS integration strategy has been selected, resources should be focused to where they are most critically needed and in this way counter conditions that contribute to the actualization of negative outcomes in a merger. We discuss each situation next.

5.1 Understanding deficiency impact in the IS integration strategy selection

Contrasting the negative outcomes in our case sample, they present high variance in the impact on the merging organizations. For example, unrealized potential ranged from minor unrealized economies of scale in the Dyrup-Plus Paint merger, to almost complete failure to reap the transformational benefits motivating the merger of Hospital A-Hospital B. This variation in impact seems to exist for each of the negative outcomes. This is important because during pre-integration assessment of possible deficiencies, merging parties have to estimate the relative impact or range of outcomes, e.g., could the merger cause a

time delay of months (as with Dyrup-Hygea and Int. Telco-Reg. Telco Y) or years (as with Fagor-Ed.-Victorio L. T. and Alpha-Beta).

With Dyrup-Malfarb, an IS absorption strategy was chosen to realize economies of scale in production, but with Malfarb's very different corporate culture the integration became highly disruptive for Malfarb. On the other hand, not implementing the IS absorption would have left possible synergies on the table. This was the case in the Fagor-Ed.-Brazilian Co merger where an IS co-existence strategy was chosen in favor of the IS absorption strategy to not disrupt Brazilian Co. A similar paradoxical choice can be found when considering the IS co-existence strategy, as in the merger of CBA-SBV. Here, the IS co-existence strategy that theoretically would enable all merger benefits seemed technically and politically unfeasible within the available timeframe (given by legal constraints). However, the IS absorption strategy that eventually was used led to substantive destruction of IT-based business capabilities.

The pre-integration assessment of an IS integration strategy should accept that completely avoiding negative outcomes may not be possible. Instead, the assessment should provide an estimation of which negative outcomes to expect and if possible 'critically' avoid. Such understanding is needed because the high complexity of the post-merger integration process requires the merging parties to focus on what matters most, and not be side-tracked by outcomes that are undesirable, but acceptable. This awareness is particularly valuable should it come down to prioritizing one negative outcome over the other.

5.2   Managing contextual factors in the IS integration implementation - post hoc analysis

We searched for insights on what merging companies might do to avoid actualization of negative outcomes[4] by returning to 25 cases excluded from our initial configurational analysis. An ex-post analysis revealed tactics for mitigating the five groups of contextual factors identified in our initial analysis that influence the actualization of different negative outcomes. We summarize below, and in Table 5, case examples for managing each contextual factor.

Table 5. Managing the effects of context influence		
Context	**Management tactic**	**Reference cases**
Time pressure	- Establish framework - Expectation management	#39: Banc Sabadell-Banco Atlantico #41: Danisco-Rhodia #52: Trelleborg-CRP

---

[4] Regarding the countering of contextual conditions, the case material is less comprehensive and would not be rich enough for a formal configurational analysis. Often, the case narratives presented few details about something that was *not* surfacing as an issue in the case.

Complexity	- Project partition	#51: Trelleborg-Chase Walton
Merger unreadiness	- Infrastructuring - Early decision making - Communication	#39: Banc Sabadell-Banco Atlantico #59: Sprint-Nextel
Socio-technical differences	- Systems replication - Change management	#43: Grupo Santander-Abbey #49: Baxter Labs-AHS #50: Suncorp-Promina
Power relations	- Assignment of decision power - Governance structures	#47: Sallie Mae-USA group #57: JP Morgan-Chase

Time pressure comprises external time pressure from legal requirements and the stock market, and internal time pressure to substantiate merger benefits. It forces the merging parties to focus on short-term benefits rather the long-term aspects of the merger [16]. Within the cases that successfully managed time pressure (see Table 5) we see the importance of an established post-merger IS integration framework that enables the merging parties to 'hit the ground running' [34]. Instead of ad-hoc deliberation and selection of the integration approach, the merging parties executed along a known path with predefined decision points. This process is illustrated in the Banc Sabadell-Banco Atlantico merger, where the parties drew on an integration framework developed in Banc Sabadell's previous mergers. This framework included well-defined tasks and decisions required to enable a rapid integration. A second tactic to manage time pressure through expectation management is illustrated with the Trelleborg-CRP merger, where they were uncertain about which IS integration strategy would be needed before closing and announcing the deal. To leave time for eventualities, Trelleborg announced a time plan only for synergies that could be realized without elaborated IS integration. When it became clear that a complete IS renewal strategy was needed, the IS integration team proceeded without the stress of external analysts pushing for realizing synergies contingent on IS integration.

Integration extent refers to data intensity and process scope of the IS integration needed. Generally, higher integration extent makes the IS integration project more complex. The post hoc case material presents one tactic for how to reduce complexity by making integration tasks more granular. For example, in the Trelleborg-Chase Walton merger, the integration project was partitioned by functional area (sales, logistics and manufacturing).

Merger unreadiness refers to the technical or social inability of the merger partners to change according to the required IS integration strategy. Regarding technical unreadiness, Danisco's acquisition of Rhodia and Genencor shows that it is possible to build in some degree of technical flexibility in the corporate IT infrastructure. However, this is conditioned on the fact that a shortcoming is detected well ahead of a merger as the time needed to address technical unreadiness is often measured in years, rather than

months. To address social unreadiness, cases report on the importance of announcing merger strategy early (Danisco-Rhodia/Genencor), defining what will happen with the personnel post-merger (Banc Sabadell-Banco Atlantico) and giving attention to the need to communicate ambitions and strategies (Trelleborg-Chase Walton, Sprint-Nextel). Broadly, this can be summarized as best practice for change management.

Power balance refers to a situation where no clear dominant actor exists and may lead to process inertia. Two options are visible in the cases on how to change this inertia. First is to proactively decide who should be the decisive partner in the merger to avoid a situation of equal parties. This approach is illustrated in the JP Morgan-Chase merger, where Chase was assigned a primary role in the decision making process because of their previous merger experiences. The second option is to actively work with governance mechanisms that promote a rational decision process. The Sallie Mae-USA group merger shows how this can be done. Here senior management established principles for fact-based decision making and provided relatively generous exit compensation for staff that were found redundant and offered incentives for knowledge transfer.

Socio-technical differences refer to incommensurability between technical (incompatible technical platforms) or social (culture) components of the merging companies. Such differences form a contributing factor in most of the deficiency configurations. There is limited information in the post hoc cases on how to counter socio-technical differences, but there is some information about how to deal with technical differences. For example, in the Danisco-Genencor merger, instead of bolting on Genencor's systems, Danisco decided to replicate the systems on their own platform, to not compromise the integrity of Danisco's platform. In overcoming social differences, it was noted that in the post hoc cases where social differences do not take center stage, firms seem to treat IS integration as an organizational change project as much as a technical change project. Case examples include the mergers of Baxter Labs-AHS, Suncorp-Promina and Grupo Santander-Abbey.

6   Conclusions and Implications

6.1   Review of main study results

This study extends our understanding of post-merger IS integration deficiencies and their actualization. We first developed a taxonomy derived from an analysis of 37 IS integration deficiency cases that comprises six deficiency categories or negative IS integration outcomes (business inefficiencies, business disruption, unrealized potential, staff reaction, delay, and overspending) and details 13 specific deficiencies. The taxonomy fills a gap by forming an integrated analytical tool to distinguish between different

types of deficient outcomes. As such, it allows for a more refined view of post-merger IS integration outcomes and is a step towards understanding the dependent variables in post-merger IS integration.

We then examined the contingent causality between IS integration and actualization of deficiencies, as explained through configurational patterns pivoting around a deficiency mechanism. Three of the patterns are associated with the IS absorption strategy: *Capability destruction, Cultural imposition*, and *Growing pains*. These mechanisms are all associated with a mismatch during the 'conversion' (socially and technically) of the absorbed company to the IS of the absorbing company. IS co-existence is associated with *Untapping Potential* and *Asymmetric standardization,* both mechanisms related to the critical task of finding the right balance between what to standardize and what to keep separate in IS co-existence strategies. *Paralysis* and *Emulsion* originate in the IS best-of-breed strategy as it requires agreement on profound changes in business practices to be effective, making the strategy subject to politicized decision making and strategizing to keep pre-merger practices. Finally, two deficiency mechanisms associated with IS renewal, *Death march* and *Rebounder*, relate to difficulties steering the exploratory development of IS towards something that enables strategic transformation of the merging organizations.

Taken together, this paper offers a highly granular explanation for the variations in a probabilistic relationship between two entities: post-merger IS integration strategy and (deficient) project outcome. The configurational models developed in this study are mid-range causal models that form an explanation that retains the contextual sensitivity between intervention and probabilistic outcome. In an area where every instance of the multifaceted phenomena is likely to present some uniquely defining characteristics, it is critical to build an understanding about the broad relationships between interventions and outcomes, and also about the contextual factors that can influence the likelihood that a particular intervention may lead to a particular outcome.

6.2 Implications for practice

The practical relevance of this paper is based on the fundamental notion that by looking at which negative outcomes occur and how they are produced in a large number of cases, merging partners can be informed on how to avoid these outcomes in future mergers. Given this assumption, our research has two main applications. First, when considering a possible merger, merging companies have to rapidly envision merger benefits as well as major threats to these benefits. At this stage, the merger team needs to develop an understanding of the IS integration challenge and the prospects for successful IS integration. Our deficiency configurations serve as a foundation to assess threats of IS integration deficiency early in the merger process and to prioritize which deficiencies are critical to avoid. Following the assessment, the engagement of the IT organization can be adapted to where they are critically needed. This reduces com-

plexity of the merger review process, permitting easier contracting with external partners and lower transaction costs, and limits the need for extensive contingency planning.

Second, when selecting an IS integration strategy, our configurational models can facilitate a discussion of possible deficiencies and their relative impact on the merger outcome. Once a strategy has been selected, understanding how (under which conditions and by which mechanism) the negative outcomes associated with the selected strategy are produced, enables merging organizations to manage the contextual factors on which the outcomes are contingent. Our post hoc analysis as summarized in Table 5 should offer some additional guidance to practice.

6.3   Limitations and Future Research Opportunities

The findings of this study are based on a one-sided focus on negative outcomes (deficiencies) in post-merger IS integration. A mirroring analysis would analyze how deficiencies are not produced. While we refine the 'dark side' or negative outcomes, subsequent research should also investigate the positive side of mergers (expected and unexpected outcomes), and what benefits beyond synergy realization can be generated from the post-merger IS integration project.

We only study the contingent causality between IS integration strategy and outcome by analyzing the IS integration strategies one by one. In some cases merging companies employ a mix of IS integration strategies. There is a possibility that such mixes can lead to interaction effects between strategies. Interaction effects may also exist between two or more mechanisms.

In addition, our findings rest in the possibility of systematic biases in the collected cases. IS absorption strategy is considered the simplest form of IS integration strategy and occurs most frequently in our sample of deficiency cases. The many deficient IS absorptions is probably a reflection on frequency rather than of the strategy's degree of difficulty. Despite these limitations, we are hopeful that this research provides an important step in understanding the deficiencies in IS integration outcomes in mergers and acquisitions by uncovering the configurational contingencies that contextually lead to their occurrence.

Acknowledgements

References

1. Accenture. Executives Report that Mergers and Acquisitions Fail to Create Adequate Value. Accenture, 2006.

2. Alavi, M., Kayworth, T.R., and Leidner, D.E. An empirical examination of the influence of organizational culture on knowledge management practices. *Journal of Management Information Systems*, 22, 3 (2005), 191-224.

3. Baker, E.W., and Niederman, F. Integrating the IS functions after mergers and acquisitions: Analyzing business-IT alignment. *The Journal of Strategic Information Systems* (2013).

4. Bhaskar, R. *A realist theory of science*. Routledge, 2013.

5. Bradley, R.V., Pridmore, J.L., and Byrd, T.A. Information systems success in the context of different corporate cultural types: an empirical investigation. *Journal of Management Information Systems*, 23, 2 (2006), 267-294.

6. Bunge, M. How does it work? The search for explanatory mechanisms. *Philosophy of the social sciences*, 34, 2 (2004), 182-210.

7. Bygstad, B., Munkvold, B.E., and Volkoff, O. Identifying generative mechanisms through affordances: a framework for critical realist data analysis. *Journal of Information Technology* (2015).

8. Davern, M.J., and Kauffman, R.J. Discovering potential and realizing value from information technology investments. *Journal of Management Information Systems*, 16, 4 (2000), 121-143.

9. Di Tullio, D., and Staples, D.S. The Governance and Control of Open Source Software Projects. *Journal of Management Information Systems*, 30, 3 (2013), 49-80.

10. El Sawy, O.A., Malhotra, A., Park, Y., and Pavlou, P.A. Research Commentary-Seeking the Configurations of Digital Ecodynamics: It Takes Three to Tango. *Information Systems Research*, 21, 4 (2010), 835-848.

11. Gao, L.S., and Iyer, B. Analyzing complementarities using software stacks for software industry acquisitions. *Journal of Management Information Systems*, 23, 2 (2006), 119-147.

12. Haleblian, J., Devers, C.E., McNamara, G., Carpenter, M.A., and Davison, R.B. Taking stock of what we know about mergers and acquisitions: A review and research agenda. *Journal of Management*, 35, 3 (2009), 469.

13. Henfridsson, O., and Bygstad, B. The generative mechanisms of digital infrastructure evolution. *MIS quarterly*, 37, 3 (2013), 907-931.

14. Henningsson, S. Learning to acquire: how serial acquirers build organisational knowledge for information systems integration. *European Journal of Information Systems*, 24, 2 (2015), 121-144.

15. Henningsson, S., and Carlsson, S.A. The DySIIM model for managing IS integration in mergers and acquisitions. *Information Systems Journal*, 21, 5 (2011), 441-476.

16. Henningsson, S., and Kettinger, W.J. Managing IT risk in acquisitions. *MIS Quarterly Executive*, 15, 1 (2016).

17. Henningsson, S., and Yetton, P. It-based value creation in serial acquisitions. *The 13th European Academy of Management Conference (EURAM) 2013*, 2013.

18. Johnston, K.D., and Yetton, P.W. Integrating information technology divisions in a bank merger Fit, compatibility and models of change. *The Journal of Strategic Information Systems*, 5, 3 (1996), 189-211.

19. King, D.R., Dalton, D.R., Daily, C.M., and Covin, J.G. Meta-analyses of post-acquisition performance: Indications of unidentified moderators. *Strategic Management Journal*, 25, 2 (2004), 187-200.

20. Mehta, M., and Hirschheim, R. Strategic Alignment in Mergers & Acquisitions: Theorizing IS Integration Decision Making. *Journal of the Association for Information Systems*, 8, 3 (2007), 143-174.

21. Pawson, R. *Evidence-based policy: a realist perspective*. London, UK: Sage, 2006.

22. Pawson, R., and Tilley, N. *Realistic Evaluation*. London: Sage, 1997.

23. Pettigrew, A.M. Contextualist research and the study of organizational change processes. *Research methods in information systems* (1985), 53-78.

24. Rivard, S., and Lapointe, L. Information technology implementers' responses to user resistance: nature and effects. *MIS quarterly*, 36, 3 (2012), 897-920.

25. Sarker, S., Sarker, S., and Sidorova, A. Understanding business process change failure: An actor-network perspective. *Journal of Management Information Systems*, 23, 1 (2006), 51-86.

26. Sarrazin, H., and West, A. Understanding the strategic value of IT in M&A. *McKinsey Quarterly*, 12, 1 (2011), 1-6.

27. Strauss, A., and Corbin, J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques.*: Sage, 1990.

28. Tallon, P.P. A process-oriented perspective on the alignment of information technology and business strategy. *Journal of Management Information Systems*, 24, 3 (2007), 227-268.

29. Tanriverdi, H., and Uysal, V.B. Cross-Business Information Technology Integration and Acquirer Value Creation in Corporate Mergers and Acquisitions. *Information Systems Research*, 22, 4 (2011).

30. Tanriverdi, H., and Uysal, V.B. When IT capabilities are not scale-free in merger and acquisition integrations: how do capital markets react to IT capability asymmetries between acquirer and target&quest. *European Journal of Information Systems* (2013).

31. Toppenberg, G., and Henningsson, S. Taking stock and looking forward: A scientometric analysis of IS/IT integration challenges in mergers and acquisitions *European Conference on Information Systems (ECIS)*, Tel Aviv, Israel, 2014.

32. Toppenberg, G., Henningsson, S., and Shanks, G. How Cisco Systems Used Enterprise Architecture Capability to Sustain Acquisition-Based Growth. *MIS Quarterly Executive*, 14, 4 (2015), 151-168.

33. Wijnhoven, F., Spil, T., Stegwee, R., and Fa, R.T.A. Post-merger IT integration strategies: An IT alignment perspective. *The Journal of Strategic Information Systems*, 15, 1 (2006), 5-28.

34. Yetton, P., Henningsson, S., and Bjørn-Andersen, N. 'Ready to Acquire': The IT Resources Required for a Growth-by-Acquisition Business Strategy. *MIS Quarterly Executive*, 12, 1 (2013), 19-35.

35. Yin, R.K., and Heald, K.A. Using the case survey method to analyze policy studies. *Administrative science quarterly* (1975), 371-381.