



A Framework for Understanding Post-Merger Information Systems Integration

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Abstract:

This paper develops a theoretical framework for the integration of information systems (IS) after a merger or an acquisition. The framework integrates three perspectives: a structuralist, an individualist, and an interactive process perspective to analyze and understand such integrations. The framework is applied to a longitudinal case study of a manufacturing company that grew through an acquisition. The management decided to integrate the production control IS via tailoring a new system that blends together features of existing IS. The application of the framework in the case study confirms several known impediments to IS integrations. It also identifies a number of new inhibitors, as well as known and new facilitators that can bring post-merger IS integration to a success. Our findings provide relevant insights to researching and managing post-merger IS integrations. They emphasize that researchers and managers of post-merger IS integration should pay particular attention to the IS and organizational merger contexts; the need to build relationships and collaboration between the merging parties; power struggles; and, perhaps most importantly, understanding and treating post-merger IS integration as a complex, messy, and evolutionary process.

Keywords: mergers & acquisitions (M&A), post-merger information systems (IS) integration, post-acquisition integration, case study

INTRODUCTION

Mergers and acquisitions (M&As)¹ are a prominent tool for corporate strategy, with the worldwide value of deals exceeding USD 2,400 billion in 2010 (Reuters 2011). As a result, thousands of firms face the challenges of post-merger integration, defined as “blending together of organizational components” (Shrivastava 1986; Mehta and Hirschheim 2007). Such integration is often problematic, and faulty integration is a significant cause of merger failures (Shrivastava 1986; Haspeslagh and Jemison 1991; Habeck, Kröger et al. 2000).

Information systems (IS) integration is noted as one of the crucial issues in overall organizational integration and, ultimately, for the success of the merger (I/S-Analyzer 1989; Merali and McKiernan 1993; McKiernan and Merali 1995; Weber and Pliskin 1996; Chin, Brown et al. 2004; Wijnhoven, Spil et al. 2006; Mehta and Hirschheim 2007). Consider the following real-life instance:

On March 4 2007, 500 US Airlines passengers missed their flights at Charlotte-Douglas International Airport and altogether thousands of US Airways passengers suffered long delays. Some passengers claimed they had not been able to speak to a ticket agent after waiting for more than two hours. This happened because of a problem with the reservation system and the fact that the automated kiosks did not work. The underlying reason was that on the same day, the airline was trying to combine the reservation systems of US Airways and America West, two years after their merger in 2005.

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This example illustrates the importance of post-merger IS integration in practice and how problems in IS integration may result in delays, lost opportunities, decreased revenues (cf. Stylianou, Jeffries, and Robbins 1996) or huge capital costs (Merali and McKiernan 1993). Remarkable counter-synergies can be hidden in information systems (Robbins and Stylianou 1999).

The merger situation poses special challenges for IS integration. It is affected by organizational differences (Weber and Pliskin 1996), and, during such restructuring, value sets are altered and power is redistributed. These make IS integrations in mergers fertile ground for employee resistance (Haspeslagh and Jemison 1991), cultural clashes (Weber and Pliskin 1996), and power struggles (Metha and Hirschheim 2007). These problems are aggravated by the fact that, instead of having to deal with one set of various stakeholders and intra-organizational subcultures, the decision-makers need to manage at least as many of these problems as there are merging organizations.

Furthermore, the impact of information systems may be overlooked in the merger planning phase (Buck-Lew, Wardle, and Pliskin 1992; Stylianou, Jeffries, and Robbins 1996), or the implications of their integration may not be fully considered (McKiernan and Merali 1995). IS personnel are often excluded from pre-merger negotiations

CONTRIBUTION

This article makes three contributions to IS research and practice. It presents the first comprehensive literature review on post-merger IS integration and thus provides a thorough description of the state-of-art in this under-researched area of IS research, on which other IS researchers can build their work. Second, it integrates the outcome of the literature study with an existing framework of IS innovation. The resulting framework can be used to examine, understand, plan, and prepare post-merger IS integrations. The framework goes beyond the conventional approaches to IS integration, which stress the importance of structural issues in post-merger IS integration by supplementing it with a focus on the characteristics and actions of the involved individual actors and stakeholders and by emphasizing the interaction between structure and individuals in a complex social process which unfolds over time. The third contribution is the particular process perspective, which in itself is quite rare in post-merger IS integration research. It is demonstrated in an in-depth case study, which provides a rich empirical account and analysis of an actual post-merger IS integration venture, which although initially plagued by problems, overcame these challenges, recovered, and came to a successful conclusion. Beyond confirming existing obstacles and facilitators, the case study uncovered barriers and mediators that are new and so far undocumented in post-merger IS-integration research. The case description can thus serve as an inspiration for future post-merger IS integration projects.

¹ In the literature on mergers and acquisitions, the use of the term *merger* is frequently used to refer to both activities: the merger of equals, and the merger by acquisition in which both parties are not-equal in terms of their size and power. Sometimes the terms are used interchangeably (Granlund 2003; Mehta and Hirschheim 2007; Wijnhoven et al. 2006). Similarly, this paper will also use the terms *merger* and *post-merger* to cover both mergers and acquisitions. The terms *acquisition* and *post-acquisition* are used to emphasize the power differences of the “acquirer” and “acquired” parties. The acquired party may be an entire company or a smaller asset (Wijnhoven, Spil et al. 2006), such as the acquired production plant in the case.

(Calabrese 1991; Mehta and Hirschheim 2007). However, after a deal has been closed, IS personnel are expected to reconcile the different systems quickly (McKiernan and Merali 1995; Wijnhoven, Spil, Stegwee and Fa 2006), even if they have not had enough time for planning and preparation (Calabrese 1991).

Our review of the literature will show that scholarly literature on post-merger IS integration is scarce. As a consequence, only a limited understanding of the post-merger IS integration process exists. This paper aims to improve this understanding. Accordingly, our research questions are: *Who and what influences the post-acquisition IS integration process, and how is post-acquisition IS integration shaped?*

The empirical data presented here portrays the case of a printing company that acquired a plant from a competitor. The printing company (now known as PrintComp) decided to integrate the IS after adopting a tailored, new system that blended together features of existing systems. In this case, many known and some new inhibitors of success were present, and yet the organization was eventually able to meet its goals for the post-acquisition IS integration project.

The paper is organized as follows. In the following section, we present the theoretical framework for our study. Our framework is based on a literature review of existing knowledge on post-merger IS integration and an analytical framework to extend the understanding of *post-acquisition IS integration*. In the third section, a longitudinal case study, as well as our data collection and data analysis approaches are described. The next section describes the case setting, followed by our case analysis. Finally, we present our findings and implications for theory and practice.

THEORETICAL BACKGROUND

The range of post-merger IS integration options varies from maintaining the status quo over different types of partial integration (e.g., front-end or back-end integration only) to full integration (Giacomazzi et al. 1997). Prior research on post-merger IS integration has reported on a range of implemented strategies, including tailoring a new IS (e.g., Jelassi and Dutta 1993), acquiring a new ERP solution (e.g., Alaranta and Henningsson 2008), adopting acquirer's IS (e.g., Mehta and Hirschheim 2007; Alaranta and Henningsson 2008), picking and mixing the best applications (e.g., Mehta and Hirschheim 2007). Also, outsourcing IS, Enterprise Application Integration (EAI), and building "bridge-ware" are among possible strategies, as well as mixing these approaches.

Our empirical study concerns a case where a full integration was achieved by tailoring a new IS that blends together features of existing IS,² and this perspective guided our literature review.

Literature Review

To position our work, we initially conducted a systematic search for articles on post-merger IS integration. (See Appendix B for more details on the selection of outlets and the performed search, as well as a summary of articles found and their key findings.) Overall, the existing literature is scarce and fragmented.

For example, the focus of existing publications are on post-merger IS planning, the role of IT fit in merger, IS integration effectiveness on mergers, success factors of post-merger IS integration, factors influencing strategic decision-making for post-merger IS integration, antecedents for effective post-merger IS integration, knowledge-sharing in post-merger IS integration, business/IS alignment in post-merger IS integration, and the effect of post-merger IS integration capability on merger performance. Much of this literature can be described as factor research (examples include Stylianou, Jeffries, and Robbins 1996; Giacomazzi, Panella, Pernici, and Sansoni 1997; Robbins and Stylianou 1999). No research providing a detailed, longitudinal account of a post-merger IS integration was found. Existing literature provides explanations of post-merger IS integration, which supplement each other, but are based on different perspectives and are focused on different phases of the post-merger IS integration process. The literature illustrates that post-merger IS integration is a multifaceted, idiosyncratic, and complex phenomenon.

Our literature review shows that one strong emphasis lies on the *structural* issues of the post-merger IS integration (see Main and Short 1989; Merali and McKiernan 1993; McKiernan and Merali 1995; Johnston and Yetton 1996; Weber and Pliskin 1996; Giacomazzi, Panella, Pernici, and Sansoni 1997; Stylianou, Jeffries, and Robbins 1996; Robbins and Stylianou 1999; Wijnhoven, Spil, Stegwee, and Fa 2006). Other research shows that *individual* managerial skills and action are important determinants of post-merger IS integration success (Stylianou, Jeffries, and Robbins 1996; Robbins and Stylianou 1999). However, the broad range of individual actions has not been studied in depth.

² This paper uses the term *post-M&A IS integration* to indicate "blending together of organizational components," following the post-M&A IS integration literature (Shrivastava 1986; Mehta and Hirschheim 2007). Enterprise Application Integration (EAI) and bridge-ware are among the options for post-M&A IS integration, but strategies for post-M&A IS are not limited to these.

Some studies (Granlund 2003; Wijnhoven, Spil, Stegwee, and Fa 2006) have taken a *process* perspective. Granlund (2003) concludes that contingency factors alone do not offer a sufficient explanation for the evolution of management accounting systems following a merger. He finds that in post-merger IS integration, structure and action are inseparable and hence form an *interactive process*, which is entrenched in the context and shaped by the history of the merger and the affected information systems (Haspeslagh and Jemison 1991, Granlund 2003, Alaranta and Henningssson 2008). This view is supported by Vieru and Rivard (2008) who suggest that ISs evolve through a process of knowledge sharing after a merger. (See Table 9 in Appendix B for a summary of the literature review.)

In these studies, either structural issues, individual managerial actions, or the process perspective are used as largely independent explanatory tools. But there is no work that combines all three perspectives.

The Analytical Framework

The three identified research streams in the existing post-merger IS integration literature serve as a frame for the development of our theoretical approach to understand and analyze the integration process in our case study. The framework's three perspectives, labeled *the structuralist*, *the individualist*, and *the interactive process* perspective, have earlier also been described and used by Slappendel (1996) to analyze research on innovations in organizations.

The combination of the three perspectives has shown to be a fruitful avenue for empirical research of other IS-related organizational changes (e.g., emergence of IS development methods and software process improvement innovations [Kautz 2004; Kautz and Nielsen 2004; Madsen, Kautz, and Vidgen 2006]). Our preliminary analysis of the PrintComp's IS integration case revealed that the combination of these perspectives is powerful in explaining integration. The focus of this research is to transfer and extend Slappendel's (1996) framework to post-merger IS integration. The paper argues that combining the three perspectives in an integrative framework allows for a more holistic understanding of post-merger IS integration. The framework also has some general relevance for IS research, as it addresses the relation between structure and agency (Giddens 1997; Rose, Jones, and Truex 2005).

To identify structural, individual, and process elements and to integrate them in a comprehensive framework, we now review the literature on post-merger IS integration.

The Structuralist Perspective

This perspective sheds light on how various structural characteristics influence and shape post-merger IS integration. The *acquisition context* as a structural element is characterized by issues such as the selected IS integration strategy, the distribution of decision making in the IS integration process, the IS/business alignment in the merger and related organizational changes, and the role of the IS in the merger (Merali and McKiernan 1993; McKiernan and Merali 1995; Stylianou, Jeffries, and Robbins 1996; Robbins and Stylianou 1999; Granlund 2003; Wijnhoven, Spil, Stegwee, and Fa 2006; Mehta and Hirschheim 2007; Vieru and Rivard 2008).

The structural characteristics of the *existing IS* affect post-merger IS integration (Mehta and Hirschheim 2007), and so do the those of the *new—desired—IS*, such as its complexity. Complexity affects the integration, depending on the magnitude of the change required (Mehta and Hirschheim 2007; Wijnhoven, Spil, Stegwee, and Fa 2006). Finally, the qualities of the *IS integration team* as a structural element impact the post-merger IS integration (Yelassi and Dutta 1993).

The aforementioned concepts allow for an understanding of how structural characteristics affect the post-merger IS integration. However, the emphasis is on fixed and static descriptions. The structuralist perspective does not address the impact of individuals, their characteristics, or their actions; nor does it account for the interaction between structure and action over time.

The Individualist Perspective

The characteristics and actions of individual stakeholders influence and shape the post-acquisition IS integration process. Previous studies emphasize the relevance of this perspective, inasmuch as individual managers have a strong influence on integration outcomes (Robbins and Stylianou 1999). Granlund (2003) reported from a post-merger integration where the role of dominant individuals was evident. Furthermore, the different human actors' understanding of each other's practices in a merger IS integration endeavor is reflected in the features of the integrated IS (Vieru and Rivard 2008).

Top management's *commitment* and support (Main and Short 1989; Robbins and Stylianou 1999) affect post-merger IS integration. Beyond top management, the literature on post-merger IS integration also identifies several other stakeholders. These stakeholders include the *IS integration project manager*, the *IS integration team*, *IS staff*, and *users* (I/S-Analyzer 1989; Main and Short 1989; Merali and McKiernan 1993; McKiernan and Merali 1995; Stylianou, Jeffries, and Robbins 1996), as well as possible *external consultants* (Jelassi and Dutta 1993).

Prior post-merger IS integration experience (I/S-Analyzer 1989; Stylianou, Jeffries, and Robbins 1996) helps IS integration managers to develop *skills* that influence their actions when managing the integration through planning, devoting sufficient resources, or when resolving conflicts and dealing with resistance or other problems (I/S-Analyzer 1989; Merali and McKiernan 1993; McKiernan and Merali 1995; Stylianou, Jeffries, and Robbins 1996; Giacomazzi, Panella, Pernici, and Sansoni 1997; Granlund 2003). Project teams and external consultants also need to possess sufficient experience and *skills* to deal with both business and technical aspects of the IS integration (Jelassi and Dutta 1993).

The *communication preferences* of the involved individuals, together with their communication skills and willingness to communicate with end users and other stakeholder groups has frequently been mentioned as an important issue in post-merger IS integration (McKiernan and Merali 1995; Robbins and Stylianou 1999). Communication preferences include clarifying both the need for change and the shared vision (Jelassi and Dutta 1993).

Finally, the users' *skills* to utilize the new system, their attitude, possible *resistance to change*, are relevant issues in post-merger IS integration (Jelassi and Dutta 1993).

These concepts allow for an in-depth understanding of the individuals responsible for and involved in the post-merger IS integration and their influence on the process. But the concepts identified do not focus on the post-acquisition IS integration as a change process.

The Interactive Process Perspective

The interactive process perspective emphasizes that the post-merger IS integration is a process that evolves over time (Merali and McKiernan 1993; McKiernan and Merali 1995; Johnston and Yetton 1996; Granlund 2003; Chin, Brown, and Hu 2004; Wijnhoven, Spil, Stegwee, and Fa 2006), where structure and action are inseparable (Granlund 2003).

Post-merger IS integration progresses through the interaction between structural influences and the skills and actions of individuals and the *content of change*. That is, the IS has to be integrated. The final product may have functionalities different from those in the original design as the IS is continuously defined and its properties change during the integration process (Vieru and Rivard 2008).

As human actors are involved, the IS integration process takes place in a social context as a social process. The *social context* of the IS integration process is affected by a number of issues such as IS resource utilization, the role of IS as a tool for restructuring and integration, improved IS capability during the integration process, the new IS's level of innovation, its impact on business, and the extent to which the outcome of the IS integration project and the integrated system depends on external issues as well as possible technical difficulties (I/S-Analyzer 1989; Merali and McKiernan 1993; McKiernan and Merali 1995; Stylianou, Jeffries, and Robbins 1996; Robbins and Stylianou 1999; Granlund 2003; Mehta and Hirschheim 2007). Relevant issues in the social context may also include the involved stakeholders' capabilities to exploit merger opportunities (Robbins and Stylianou 1999), as well as changes in the integration objectives and integration strategy and schedule delays (Granlund 2003), or changing user needs (Jelassi and Dutta 1993). Other aspects of the social context may concern unintended consequences of the IS integration, such as the disruption of business operations or different user satisfaction with the IS integration (Robbins and Stylianou 1999).

The focus in the interactive process perspective lies in those elements of the social context which make up the social relations among the participants of the IS integration project; their social infrastructure; history of the IS integration, including previous integration projects, as well as previous procedures, structures, and commitments (Haspelslagh and Jemison 1991, Granlund 2003, Alaranta and Henningsson 2008, Vieru and Rivard 2008) which shape the post-merger IS integration process.

Cultural and political aspects characterize the *social process* of post-merger IS integration. Several studies (I/S-Analyzer 1989; Weber and Pliskin 1996; Granlund 2003; Chin, Brown, and Hu 2004) have found that organizational culture and conflict affect post-merger IS integration, as do political and power structure issues (Merali and McKiernan 1993; McKiernan and Merali 1995; Granlund 2003; Mehta and Hirschheim 2007). A lack of common language adds to these problems (Granlund 2003).

In summary, the interactive process perspective builds on and complements the structural and individualist perspectives. The three perspectives form a comprehensive and coherent analytical approach that will be used to organize, describe, and analyze the data from the post-acquisition IS integration in the case company. Table 1 summarizes the three perspectives and their key components.

Table 1: The Analytical Framework

Perspective	Key Components
Structuralist (Structural characteristics)	<i>Acquisition context; existing information systems; new, desired information systems; and IS integration team</i> <ul style="list-style-type: none"> • Characteristics hereof influence and shape the post-merger IS integration.
Individualist (Individual characteristics and action)	<i>Top management commitment; prior post-acquisition IS integration experience; post-acquisition IS integration skill; communication preferences, resistance to change</i> <ul style="list-style-type: none"> • Influence the individuals' actions, which in turn influence the post-merger IS integration
Interactive Process (Structure, action, and their interaction over time)	<i>Content of change</i> —the planned and the actual post-merger IS integration process emerge in interaction with the social context and social process. <i>Social context</i> —social relations, infrastructure, and the history of previous procedures, structures, and commitments influence and shape the post-merger IS integration. <i>Social process</i> —cultural, political, and power aspects of the merging organizations and IS departments influence the post-merger IS integration.

RESEARCH APPROACH

We opted for a longitudinal qualitative case study, as it allows for a detailed in-depth scrutiny of post-merger IS integration in its real-life settings (Yin 1984; Eisenhardt 1989). Such a qualitative method facilitates the examination of the case from the three analytical perspectives chosen for this study at the desired level of detail.

Case PrintComp

The empirical data for this paper was collected from the post-acquisition IS integration at PrintComp, a European printing company, which produces magazines and glossy brochures. The chosen case is interesting (1) because it presents a process of fully integrating the different IS after an acquisition, and (2) because the organization blended features of existing ISs to a tailor-made new system. Such a case allows for a detailed observation of a vast array of issues in an IS integration process. We also had broad access to information over time from multiple organizational levels, and the external IS vendor.

PrintComp assumed its current form in 1999 when it acquired a printing plant (plant P1) from a competitor. Prior to the acquisition, PrintComp already owned plant P2, its primary production site, and three more plants, which we call P3, P4, and P5. While the plants P2–P5 were located in the area of one city (in the following referred to as the Historical city), P1 was located in another city, the Capital city (also a pseudonym).

During the period 1999–2002, PrintComp had tried to integrate its production capacity several times, but these attempts had failed because of employee resistance. For that time period, the geographically separated plants of the organization shared only a common brand name, the top management team, and some high-level financial reporting. But, in their daily operations, they maintained their pre-merger processes, procedures, and organizational cultures.

In 2002, management decided to integrate the ISs in the different plants to finally integrate the production processes across plants and to enable better financial reporting. For this purpose, a new integrated production control IS was developed by an external vendor. However, the IS integration process was complex and troublesome, and different problems were reported from the various plants.

The purpose of the new, integrated IS was to allow coordination of production between plants as well as better financial reporting and control. The new IS blended the business logic of the old IS at plant P1 and the user interface of the old IS at plant P2. The new IS consisted of modules and applications for sales, manufacturing, inventory, and supply, as well as cost accounting and financial reporting for the company's specific production process. These applications are typical for ERP systems, and for this reason, both the vendor and PrintComp called the IS *PrintComp's new ERP*. The integrated IS also comprised new functionality to coordinate production between plants.

Accounting functions, such as accounts receivable and payable, asset accounting, book-keeping, as well as human resource management applications, were not intended to be in production in the local plants because PrintComp administered these applications centrally.

Data Collection

We followed the case organization over a period of thirty months, and our research covers a time span of nearly six years after the merger of the IS integration process. We gathered data from the case via semi-structured interviews and through internal documents. The interviewees were selected to cover the various roles and management levels involved in the studied IS integration process. The roles included representatives of top management, the integration project manager, user support, users at different levels, and the software vendor. The initial list of informants was composed in cooperation with the integration project manager, and more interviewees were added, based on insights and suggestions gained in the interviews. Multiple interviews and a few informal discussions were conducted with some key interviewees such as the integration project manager.

The interviews were conducted by the first author in three interview rounds in 2003, 2004, and 2005. The interviews lasted between one and one-and-a-half hours. In 2003 and 2004, extensive notes were taken during the interviews, and in 2005, when more trust was established, interviews were tape-recorded and transcribed.

The interview themes were organized along the timeline of the IS integration from designing the IS integration strategy to the execution of the IS integration. For each phase, problems, strengths, and success and failure issues were discussed. The actual interview themes were refined for each interviewee to match their expertise and adapted to capture the topics that emerged during the interviews. Examples of the interview questions are presented in Appendix A.

The data collected via interviews were complemented with the case company's internal reports to gain a broad view of the phenomenon in question (Yin 1984; Eisenhardt 1989). The report contained, among other things, the company's yearly internal surveys of end-users' views on the new IS. Table 2 contains both a timeline of the post-acquisition IS integration project and a summary of the data collection process.

Data Analysis

Our understanding of post-merger IS integration came about through an iterative process of interpretation, comparison, and intertwining of prior research with empirical data. Data collection that took place over a three-year period was carried out in an exploratory manner, yet was informed by the concepts provided by the existing literature. Both new research results published after the start of this study and suitable theoretical frameworks for understanding the complexities of post-merger IS integration were sought throughout the process of carrying out the study.

The development of the analytical framework was informed by the knowledge gained during the process. A context-based and process-oriented description of the phenomenon which was produced by the first author and which acknowledges the interviewed individuals as actors, and the framework to provide valid explanations laid the groundwork for the interpretive epistemological and ontological orientation of our research.

The interview and other data were analyzed with the help of NVivo software. The concepts in the analytical framework were used as nodes for coding the empirical data. We organized the data according to our framework's categories, due to the iterative nature of this study; that is, our growing knowledge concerning the case, together with the previous literature on post-merger IS integration, had informed the crafting of the concepts. On occasions where the data did not match these categories, the observations were coded as free nodes and received specific attention in the subsequent analysis. One example of this was the identification of the simultaneous changes in the ways of doing printing business that took place during the post-merger IS integration. This influence was conceptualized as a structural component, which was not identified in the earlier literature.

Third, constant comparison across data sources (multiple informants) and across data collection methods (interviews and internal reports), as well as the constant search for contrasts, negative evidence, and unexpected findings were used to further strengthen our interpretation. (See APPENDIX C for an example of constant comparison.)

Table 2: The Post-acquisition IS Integration Project Timeline and the Data Collection Process

Project timeline	Time of data collection	Data collected
1999 • PrintComp buys a plant, plant P1, from its competitor		(covered post-hoc in interviews; see below)
1999–2002 • Failed attempts to integrate production in all plants • Decision to develop and implement a new IS in plant P1 • Decision to extend the new IS to a company-wide ERP-like IS to achieve integration of production process and IS • Development of a new, integrated IS		(covered post-hoc in interviews; see below)
Jan. 1, 2003 • Implementation of the new, integrated IS in plant P1 as pilot site	April 2003	<ul style="list-style-type: none"> • 11 interviewees: Implementation Project Manager, CFO, Information Systems Designer, Customer Service Manager, 2 Plant Managers, 2 Controllers, 2 Customer Service Clerks, Project Manager of the software vendor • Documents: end-user survey, brochures, project plans, financial data
Jan. 1, 2004 • Implementation of the new, integrated IS in 3 other plants (P2, P3, P4)	May 2004	<ul style="list-style-type: none"> • 6 interviewees: Implementation Project Manager, CFO, Information Systems Designer, Controller, Customer Service Manager, System support • Documents: end-user survey, employee journals, financial data
Jan. 1, 2005 • Implementation of the new, integrated IS in the last plant P5 and follow-up	May–June 2005	<ul style="list-style-type: none"> • 7 interviewees: Implementation Project Manager, CFO, Controller, Chief Production Officer, Project Manager of the software vendor, Programmers of the software vendor • Documents: end-user survey, employee journals, financial data

CASE SETTING: POST-ACQUISITION IS INTEGRATION IN PRINTCOMP

PrintComp, a European print house, which produces periodicals and promotional materials, acquired a production plant (plant P1) from a competitor. It chose to pursue a full IS integration to improve control of the production process, to better coordinate its overall production capacity, and to enable better financial reporting. In the following, we provide a brief history of the IS integration project from before its inception in 1999 up to its official close in 2005.

After acquiring P1, PrintComp's production grew substantially, and its profitability has continued to be satisfactory. However, the IS integration process was difficult, and various problems occurred in different plants. The way the printing business operated changed dramatically during the integration project, with the unforeseen introduction of mass-customization in digital printing. In addition, a key customer changed its operations mode, posing new requirements for PrintComp's information system.

In 1998, PrintComp employed approximately 300 people in its existing plants. At the same time, the number of personnel at plant P1 numbered around 230. The plants PrintComp owned prior to the acquisition of P1 were organized on a functional basis. They operated with an integrated, tailor-made IS, an ERP-like system that imposed a great deal of control on the production process. Production at plant P1 was organized in terms of processes focused on customer service. Plant P1 also used a tailor-made IS, allowing for flexibility based on specific customer demands.

In 1999, PrintComp acquired plant P1, at which point the company's management concluded that P1 had the more efficient production processes and decided to implement those processes in the other plants, too. At this time, the



plan did not include integrating IS. However, PrintComp's production function asked for IS integration as soon as the acquisition decision had been made. These attempts, ongoing from 1999 throughout 2002, proved unsuccessful.

Since plant P1's previous owner had not included the continued use of its IS in the deal, PrintComp decided to first develop a tailored IS to run P1 alone and appointed a project manager in 1999. A deal was made with a domestic vendor to deliver a new IS within three years. The requirements for the new information system for P1 were defined in 1999. The system was to be based on the business logic of P1's former IS and on the user interface of the IS running at PrintComp's primary production site, plant P2.

In early 2000, management concluded that a tailored integrated IS would bring strategic competitive advantage and decided to extend the new IS's scope to the rest of the company. An IS integration team was set up. The team consisted of a project leader who was later promoted to IS integration project manager, two support staff, and four to five functional groups consisting of key staff from the different plants to provide requirements for the new IS. The project also had a steering committee consisting of the project manager and four to five senior managers.

In January 2003, PrintComp started to implement the new system in P1 as the pilot site. At this time, the functional groups and the steering committee were dissolved. Utilization of the integrated IS commenced at plant P1 in 2003 with a test period, which was due to end four months after implementation. But the users were frustrated. Implementation at the pilot site proved difficult, as the IS was inaccurate, flawed, and full of code bugs. Due to the poor quality of the system, some functionality had to be tuned and reprogrammed, leaving the test period unfinished according to the plan. Conflicts of interest with the vendor became apparent; nevertheless, the user operators at P1 used the system.

In 2004, the new IS was implemented in three more plants. It included functionality to coordinate production between plants. Implementation at plant P5 had to be delayed, due to insufficient quality of some critical software modules designed for use in P5 alone. Despite the IS still being plagued with bugs, it was up and running, it supported operations, and it produced tangible benefits such as better control and coordination. Users, however, were dissatisfied at all plants. Users at plants P2–P4 found it hard to simultaneously change their work processes and start using the new IS. They felt that the IS which had been developed for P1 and the accompanying work processes had been imposed on them.

By 2005, the integrated IS was finally in use at all five plants, and a newly performed user satisfaction survey showed that satisfaction had widely improved. The IS integration project was officially closed at the end of 2005.

ANALYSIS OF THE POST-ACQUISITION IS INTEGRATION PROCESS

We now present a detailed analysis of PrintComp's IS integration, emphasizing different aspects of the case according to the structuralist, individualist, and interactive process perspectives.

The Structuralist Perspective

The acquisition context was characterized by PrintComp's intention to prevent over-capacity in the market by acquiring plant P1 from a competitor. Synergies in production were also sought. However, several attempts to integrate production—without integrating IS—failed. Given this background, top management decided to use full IS integration as an enabler to achieve the desired production synergies.

This strategy secured an initial alignment of business and IS. However, the managerial perspective on coordination and control was rather general and resulted in only vague requirements for the new IS. In addition, the business environment changed simultaneously due to, among other things, the introduction of mass customization of print products. Together, this resulted in a development process where requirements were changing continuously. As a consequence, the new IS initially had a modest quality, some of its functions had to be refined, and the IS as a whole underwent frequent alterations.

The old ISs in the different plants were tailor made and represented different ways of operation, but they were not appropriate for the new mode of operation. Yet, they had some strengths, both with regard to business logic and process efficiency, and with regard to process control and the user interface.

Plant P1 needed a new IS sooner because its IT infrastructure was not part of the acquisition deal. As no updates of the existing IS in the other plants were available, a combined, tailored solution to cater to the peculiarities of PrintComp's integrated business was developed. The vision was to blend together P1's IS business logic and the other plants' process control and user interface.

This new IS was initially disliked by all parties. As plant P1's business logic was chosen and P1 had an urgent need to get a new IS, the representatives from this factory received a privileged role in the IS requirements definition. This resulted in the other plants' employees appreciating the IS even less. The situation was aggravated by the fact that the IS contained many errors and was frequently changed.

This can be explained by the structural characteristics of the IS integration team. At the outset, the IS integration team represented a broad range of necessary roles and resources. However, the core project team had no time for several critical tasks. The most important was testing the new IS thoroughly, and thus partly erroneous software was initially installed. As the official functional groups were disbanded soon after the original requirements were defined, their views were not represented properly in the course of the project. The small IS project team was then solely responsible for the requirements gathering and their realization. The team could not make up for this omission, although the functional groups' members continued to cooperate with the project team informally. In addition, the steering committee had already been dissolved prior to the first installation of the new IS, thereby losing the resources for long-term strategic planning.

The structuralist perspective provides a valuable insight into what and who influences the post-merger IS integration process and how the process is shaped (see Table 3 for a summary). But it does not explain in-depth why that process was problematic and why and how it succeeded despite all problems. In the next part of our analysis, therefore, we take a more detailed look at the role of the involved individual actors.

Table 3: The Structuralist Perspective

Elements	Characteristics	Influence on post-merger IS integration process
<i>Acquisition context</i> <i>Decision making</i> <i>IS/business alignment</i> <i>IS integration strategy</i> <i>Organizational changes</i>	<ul style="list-style-type: none"> • Management made initial decisions. • Management found P1's processes superior. • Requirements based on a need to coordinate and control production better • Simultaneously changing business environment 	<ul style="list-style-type: none"> • Fully integrated system • Good IS/business alignment • P1 had a prominent role in the requirements definition. • Vague requirements definitions and unstable development • Refinement of some functions
<i>Old and new information systems</i>	<ul style="list-style-type: none"> • P1 needed a new IS, as continued use of the old IS was not permitted. • P1 and PrintComp used IS tailored to their needs. • None of the existing ISs had the necessary properties. • The new IS was fitted to PrintComp's peculiarities. • The new IS was initially erroneous. • The user interface resembled PrintComp's old IS, its functionality P1's old IS. 	<ul style="list-style-type: none"> • The new system was developed first for P1 then extended to the whole company. • A tailored system was chosen. • Mixing components from each prior system • Users in P1 were dissatisfied with the degree of user friendliness. • Users in P2–P5 were dissatisfied with the new operations mode. • Users in all plants felt they had to use the others' IS.
<i>IS integration team</i>	<ul style="list-style-type: none"> • Small IS integration project team • Steering committee dissolved quickly. • Functional groups dissolved early. 	<ul style="list-style-type: none"> • Not enough resources for critical tasks • No strategic planning later in the project • The functional groups' views were not represented properly.

The Individualist Perspective

Viewing stakeholders as individuals, not as structural elements, uncovers the fact that top management did not show particular commitment to or support for the IS integration project. They provided only very limited human resources and no other support for the project team. The managers dissolved the steering group and left the project before the IS was installed in plant P1. An internal user survey indicated that the users were actually unaware of any top management involvement.

Emphasizing management decisions as elements of the structuralist perspective, our first focus is on the Chief Financial officer (CFO), a member of top management and of the steering group, who played a significant role. He had some experience from a smaller acquisition. He also had an overall strategic vision of the IS needed and a positive attitude toward state-of-the-art IT. He communicated this attitude, which had positive effects on the IS integration on company level and in several plants, removed the earlier "us and them" feeling, and pushed IS as an enabler for the overall organizational integration. He also heavily influenced the decision to opt for a tailored solution, but he did not possess any specific IS-planning skills.



In contrast, the IS integration project manager (PM) and the newly appointed production manager—a key user, both from acquired P1, did not have significant experience of large IS projects; nor did they have prior merger experience or a clear vision of IS integration. The project manager alone had to lead the project. This led to inefficient integration management, as well as scope and resource problems. This was especially true when the IS project was extended from P1 to a new, integrated IS for all plants in the company. As P1—and consequently these two managers—had a dominant role in the requirements definition process, their individual skills led to initially vague requirements and equally vague IS functions.

The project manager's decision to implement all modules simultaneously, and his over-optimism regarding the quality of the first versions of software delivered, aggravated the problems. Due to the project manager's estimation errors, insufficient personnel were devoted to the project. Thus, the software could not be tested properly and the schedules were delayed. This explains further why erroneous software was implemented. The vendor's development manager noted that this was also due to his own and his development team's poor understanding of PrintComp's production process.

However, the IS integration project manager had great learning skills and started deploying more efficient approaches. Together with the two project team members, he ensured that bugs were eventually fixed. After implementing the new IS in plants P1–P4, he had gained enough experience and confidence to make the decision that the implementation in P5 had to be postponed because modules critical for its operation were still unstable.

Communication had been planned to be open, but in practice it was not effective. Nobody had communicated the importance of the project to the employees at the start, and there was very little two-way communication between the project team and users. The project manager stated that he was initially too occupied with technical problems to have time to inform the users of the project's progress. The CFO preferred receiving information from the project manager only and remained invisible to the rest of the integration team and users. Later, the project manager improved his communication. He engaged in active two-way communication with the end-users and ensured that they received help from the support staff in the project team. This was highly appreciated. Together with increasing software quality, it supported the eventual acceptance of the system.

User resistance was an early reaction to the communication flaws, as the users received no response to their concerns. They lacked an understanding of why it was important to key-in the information carefully and saw it as a chore. They also felt that they did not have enough skills when the system went live and needed more training. The end-users in all plants started to resist the new IS actively and complained; the pricing module simply was not used at all. This situation eventually improved when the project manager offered information and assistance.

Table 4 provides a summary of how the individualist perspective sheds light on PrintComp's post-acquisition IS integration. Together with the structuralist perspective, it allows for a closer look into the interaction of these individuals within the given structures. This process view is subject of the last part of our analysis.

The Interactive Process Perspective

In the interactive process perspective, we take as a starting point the content of change. The initial content of change was to substitute P1's prior owners' IS with a new IS. The new IS was to combine P1's business logic and work processes with the other plants' IS interface and control features. It would adjust P1 to the company's mode of control.

What emerged was a complex and evolutionary IS integration process, which was characterized by changing plans, refinements of requirements, redevelopment of inappropriate software, and user frustration and resistance. Ultimately, this resulted in fully integrated work processes and a tailored IS for the whole company, which realized management's objectives and was accepted by everyone in all plants.

Table 4: The Individualist Perspective

Elements	Characteristics	Influence on post-merger IS integration process
<i>Management commitment</i>	<ul style="list-style-type: none"> No commitment in general 	<ul style="list-style-type: none"> No support for the project team Insufficient human resources
<i>Prior post-acquisition IS integration experience</i> <i>Post-acquisition IS integration skills</i>	<ul style="list-style-type: none"> CFO had experience from smaller acquisition, an overall strategic vision of IS, and a positive attitude toward IT, but no specific IS planning skills. Project manager and productions manager had no post-merger IS integration experience, no experience from large IS projects, no prior IS planning skills. Project manager had a personal learning capability. Vendor's project manager and development had a poor understanding of the needs of PrintComp. 	<ul style="list-style-type: none"> IS as enabler of the organizational integration Purchase of a tailored IS Removal of "us and them" feelings at management and company level Inefficient IS integration management Inefficient requirements definition Lack of human resources Schedule delays Problems with IS quality
<i>Communication preferences</i>	<ul style="list-style-type: none"> CFO preferred communication with project manager. Project manager had initially little no time to communicate to users. Project manager and project staff communicated help to users. 	<ul style="list-style-type: none"> Top management support invisible to the project team and users Users became frustrated. Users lacked understanding of the new IS. Support staff's help was appreciated. Increased acceptance of the system
<i>Resistance to change</i>	<ul style="list-style-type: none"> Users lacked understanding of new IS and skills for using it. 	<ul style="list-style-type: none"> Opposition in the form of complaints Refusal to use one module

The social context and the social process in which the integration process took place points to the history, social relations, and a political power constellation where the CFO favored a domestic vendor. The CFO had a long-standing business relationship with this vendor. He had power to make this choice, even though the vendor's development team did not have an understanding of the new production processes.

The social infrastructure and the social relations of the post-merger IS integration process were characterized by new relationships and several pairs of antagonists. The new relationships were initially detached, distant, and formal. The CFO and the project manager, the project team, the future users, the employees of plant P1, the employees of the other plants, as well as the project team and the vendor, were antagonist pairs. The involved parties did not know each other, and no mechanisms were in place to change this. From a historical perspective, the different types of previous IS led to a situation where the integrated solution initially was disliked and opposed by all employees, either for its features or its interface.

This led to frustrations and feelings of "us and them" frequently changing and refined requirements, as well as demands to alter the IS under development. However, Social relationships developed over time. The project team, which internally had good and close relations, started helping the users. The project team's vendor relationship improved through the introduction of a software tool for handling and monitoring change requests. This, in turn, resulted in a better quality of the IS. These improvements compensated for a largely withdrawn top management.

Power issues impacted the social process. The CFO exerted power in regard to choosing a less competent vendor, but also by promoting a well-aligned, tailored IS. The project manager had limited power with regard to getting necessary resources, but also with regard to the vendor and users. This led to lengthy negotiations with the vendor and user problems, such as frequent change requests and resistance. There was also an operational level power struggle related to the naming of the production lots, as both merging sides preferred their own naming systems. Eventually, a compromise was reached in a time-consuming process, in which a shared language and common work processes were developed.



This social process has to be seen in light of the general culture and political rivalry of the two cities in which the plants are located. The competition is usually expressed through irony and mutual resentment. Doubts about the new IS were also voiced this way.

These problems decreased as the software quality improved, errors were fixed, and the users learned to use the system. A user survey in 2005 showed that the employees finally were satisfied with the new, integrated IS. By the end of 2005, the new IS supported the integrated production, as well as allowing for better coordination and reporting, and the IS integration project was closed. Table 5 comprises the main insights from the interactive process perspective.

Table 5: The Interactive Process Perspective

Elements	Characteristics	Influence on post-merger IS integration process
<i>Content of Change</i>		
New IS and work processes	Planned: <ul style="list-style-type: none"> • Transfer of work processes from P1 to other plants before implementation of new IS • Development of an effective production planning, coordination, and control IS • Initial plans to development a new IS for P1 only • New plan of development of a common IS for the whole company 	Materialized: <ul style="list-style-type: none"> • New IS used as a vehicle for implementing P1 processes in other plants and organizational integration • A tailored solution • Project scope, budget and schedule extended early to cover the whole company; P1 as pilot and later for the other plants • Opposition and frustration • Initially erroneous software • Redevelopment • Realized management's goals • Eventually accepted by everyone
<i>Social Context</i>		
History	<ul style="list-style-type: none"> • Previous system purchased from domestic vendor • Different types of previous systems 	<ul style="list-style-type: none"> • Selection of the same vendor • Dislike and frustration
Social Infra-structure	<ul style="list-style-type: none"> • Pairs of antagonists: CFO and project manager, project team and users, P1 and other plants, Project team and vendor 	<ul style="list-style-type: none"> • Communication problems • Tension and frustration • Frequent requirements changes • Tense negotiations with vendor
Social Relations	<ul style="list-style-type: none"> • Management (CFO) favored known domestic vendor • New and detached relationships • Implementation of appropriate tools to support communication with vendor • Withdrawn top management • Close relation of project manager and project team members; their joint effort 	<ul style="list-style-type: none"> • Selection of vendor and tailored IS • Distant and formal communication • Improved communication and relationship • No concrete management support • System acceptance
<i>Social Process</i>		
Politics	<ul style="list-style-type: none"> • CFO had power to opt for domestic vendor • Operational level power issues during design of the IS • Project manager had only limited power 	<ul style="list-style-type: none"> • Selection of vendor and tailored IS • Disagreement in design process • Time-consuming solution • Shared language and agreed work routines • Users' refusal to use a system module • Frequent requirements changes • Tensions with vendor • Limited resources
Culture	<ul style="list-style-type: none"> • Rivalry of the cities of plants' locations; different systems, processes and procedures 	<ul style="list-style-type: none"> • Aggravated "us and them" attitudes

In the following we summarize our findings and then discuss what could have been done to support the IS integration process, which events could have been predicted and avoided, what was unpredictable and unavoidable, and what had to be dealt with as it occurred.

SUMMARY OF FINDINGS

To summarize, we revisit the preceding analysis and identify a number of inhibitors and facilitators of the IS integration process at PrintComp. These help to understand the messiness and complexity, but also the ultimate success of the IS integration in the case. The inhibitors led to the problems described in the previous sections. On the other hand, the facilitators turned the problems into a successful IS integration. Table 6 summarizes the inhibitors and facilitators.

IMPLICATIONS

The presented framework allows for gaining insight on issues that both inhibited and facilitated the post-merger IS integration at PrintComp. While many of the inhibitors of PrintComp's IS integration could have been predicted based on prior literature, some were not known. In particular, the framework provides new insight into why, despite all the problems, PrintComp eventually succeeded in its post-merger IS integration.

First, the structuralist, individualist, and interactive process perspectives of our framework guide the attention to previously known inhibitors of success in both post-merger and more general IS implementation contexts. These include technical problems (McKiernan and Merali 1995; Johnston and Yetton 1996; Stylianou et al. 1996), executive heedlessness (Stylianou et al. 1996; Mehta and Hirschheim 2007, Yelassi and Dutta 1993), communication problems (Robbins and Stylianou 1999), user resistance (Yelassi and Dutta 1993), and vendor's competence (Yelassi and Dutta 1993).

Second, the framework allows us to focus on previously known inhibitors of post-merger IS integration such as the difficulties to blend together different IS components (Johnston and Yetton 1996; Mehta and Hirschheim 2007), allocation of a suitable IS integration team (Yelassi and Dutta 1993; Brown et al. 2003), and power issues (Mehta and Hirschheim 2007; Granlund 2003). The role of power difference between the acquirer and the acquired unit noted in prior literature (Mehta and Hirschheim 2007) took the form of the project manager's limited power, as he did not have prior history with the parent company.

Table 6: Inhibitors and Facilitators of Post-merger IS Integration

	Inhibitors	Facilitators
Structualist perspective	<ul style="list-style-type: none"> • Decision to pursue integration without IS • Decision to limit IS to one plant • Decision to combine IS features • Vague and changing requirements for the new IS • Errors and alterations in the new IS • Small IS integration team • Dissolution of steering committee and functional groups 	<ul style="list-style-type: none"> • Decision to use IS as integration enabler • Decision to pursue full IS integration • Decision to tailor IS • No updates for old IS available • No permission to use plant P1's IS
Individualist perspective	<ul style="list-style-type: none"> • Top management's lack of commitment and support • CFO's preference for limited communication • PM's lack of experience • PM's preference for limited and one-way communication • Users' lack of skills and their resistance • Vendor's initial lack of competence in the application area 	<ul style="list-style-type: none"> • CFO's strategic vision • CFO's positive attitude • PM's growing IS integration management skills • PM's changed preference for open and two-way communication • Project team members' support for users



Interactive process Perspective	<ul style="list-style-type: none"> • Choice of initially less competent vendor • New, initially detached relationships • CFO's power exertion with regard to vendor choice • PM's limited power • Power struggles among users • Cultural rivalry between towns 	<ul style="list-style-type: none"> • Improved professional handling of development and integration process and change requests • Developing relationships • CFO's power exertion with regard to tailored IS • Project team's good internal relationship • Negotiations • Improved exchange of information • Development of shared language
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Third, the framework allowed us to pay attention to some important, merger-specific inhibitors in this IS integration endeavor. The organizational difficulties of integrating the merging companies' IS components became apparent as the company chose to blend best features of different productions in order to building a new integrated system. The project manager's unavoidable lack of experience with one of the organizations jeopardized integration. The existing literature suggests that prior merger experience may facilitate the IS integration (Stylianou et al. 1996; McKiernan and Merali 1995), but PrintComp did not have a history of similar IS integration. Thus, it was impossible to find an IS manager with both integration experience and sufficient knowledge and experience from PrintComp.

The interactive process perspective of the framework was particularly useful in drawing out new, merger-related insights into inhibitors of IS integration. The new, initially detached relationships, user-level power struggles over the new IS, as well as cultural rivalry between the merging sites, clearly troubled the IS integration.

When discussing the inhibitors of post-merger IS integration, the framework's merit is in integrating and organizing existing knowledge on post-merger integration as well as discovering some new obstacles. Knowing that PrintComp's IS integration was disturbed by all these predictable and unpredictable issues, we need to know how it eventually succeeded.

First, as reported in the literature, the integration was facilitated by strategic decisions, such as the decisions to use IS as an enabler for change (McKiernan and Merali 1995), to pursue full IS integration (Robbins and Stylianou 1999), and to tailor the new IS to the company's needs (Jelassi and Dutta 1993). Also, the CFO's strategic vision (Robbins and Stylianou 1999) and his positive attitude toward IT (Merali and McKiernan 1993) supported the IS integration. Second, our findings emphasize that IS context matters (Walsham 1993), as these favorable decisions were partly guided by the fact that no updates were available for the old IS.

Third, while the project manager's good integration skills and preference for open communication (Robbins and Stylianou 1999), as well as user support, and managing the vendor relationship professionally are not new facilitators to the IS literature, the analysis of the PrintComp case showed how learning and evolution of these skills and preferences supported IS integration.

Fourth, a well-functioning IS integration team facilitated integration (Brown et al. 2003; Jelassi and Dutta 1993). We also identified the role of and power issues related to prominent individuals (Granlund 2003) as a facilitator. While this was known from the IS literature and post-merger research in other areas such as Accounting, it had previously not been found in post-merger IS integration.

Fifth, we identified new facilitators of post-merger IS integration. The merger context poses the challenge of two previously unknown parties needing to collaborate. PrintComp succeeded in developing new relationships between the managers of the two organizations, negotiating compromises in defining the new IS, improving the information exchange, and developing a new, shared language. The known and new facilitators and inhibitors are summarized in Table 7.

In sum, the framework shows its merit in identifying and integrating a number of facilitators and inhibitors of post-merger IS integration success. Many facilitators and inhibitors are new to the post-merger IS integration literature. Some facilitators are known from the IS literature or other related research such as post-merger integration in Accounting. Yet others are specific to IS issues in mergers and are new.

Many of the key inhibitors are relatively instantaneous or constant as well as avoidable. These inhibitors have mostly been predicted by prior literature (cf. Table 7). Yet the post-merger IS integration is a special context, in the sense that there are two previously separate entities that are blended together. This unavoidably leads to problems due to lack of experience with and knowledge of the other party. Thus, an organization addressing post-merger IS

integration will benefit from a thorough analysis of its particular merger context as well as the prior and new information systems. This way, it will have a better understanding of how and why the context favors or constrains certain decisions. To improve chances of success, organizations facing the challenges of post-merger IS integration should ensure that the decision-makers have prior experience from such organizational transformations, enough knowledge and good relationships with both merging organizations, as well as sufficient IS skills. It may be that to bring all these skills together, more than one person is needed. In this case, a smooth and efficient collaboration between the different sources of knowledge should be ensured. It may also be beneficial to improve the decision makers' and executors skills by, e.g., training, or bring in consultants or other forms of external expertise to fill in possible gaps in IS integration knowledge.

This blending of two originally separate units is an evolutionary change process in nature, leading to inhibitors that appear and whose nature changes over time. As a result, managers of post-merger IS integration will face obstacles that are both unavoidable and unpredictable and should thus stay sensitive to such problems and be prepared to respond to them throughout the project.

A key insight is that the post-merger IS integration experiences evolutionary paths are messy and surprising. Thus, researchers and managers should be sensitive to the emerging pressures that shape the actual post-merger IS integration and be ready to adapt their plans and actions accordingly.

Key components of the messiness and complexity of post-merger IS integration include some inhibitors that can be avoided and others inhibitors that cannot be avoided; some inhibitors also evolve over time. Table 8 summarizes these. For example, new, initially detached relationships are rooted in two previously separate organizations which merged into one. Similarly, it is nearly impossible to find a project manager who would have prior experience from both merging companies. Such inhibitors need to be recognized and proper risk management applied.

Our case study also illustrates how some inhibitors (see Table 8) covering much of the lifespan of post-merger IS integration are long-lasting and evolve during the process. Consequently, the problems they caused appear at different stages of the integration process and take different forms. For example, an IS integration team that has sufficient personnel size and diversity of knowledge is needed, but it may be difficult to predict the size and composition of such a team in advance. Therefore, management has to be prepared to add resources during the integration. A final instance of such an evolutionary inhibitor is cultural clashes and power struggles. Their source should be analyzed, and management should prepare for mitigating these problems to achieve successful post-merger IS integration.

Table 7: Known and New Facilitators and Inhibitors of Post-merger IS Integration

	Inhibitors	Facilitators
Findings known from existing literature	<ul style="list-style-type: none"> • Decision to pursue integration without IS • Vague and changing requirements for the new IS • Errors and alterations in the new IS • Small IS integration team • Dissolution of steering committee and functional groups • Top management's lack of commitment and support • CFO's preference of limited communication • PM's preference of limited and one-way communication • Users' lack of skills and their resistance • Vendor's initial lack of competence in the application area • Choice of initially less-competent vendor • CFO's power exertion with regard to vendor choice 	<ul style="list-style-type: none"> • Decision to use IS as integration enabler • Decision to pursue full IS integration • Decision to tailor IS • CFO's strategic vision • CFO's positive attitude • Project team members' support for users • CFO's power exertion with regard to tailored IS • Project team's good internal relationship



<p>New findings</p>	<ul style="list-style-type: none"> • Decision to combine IS features • PM's (inevitable) lack of experience • New, initially detached relationships • PM's limited power due to background in acquired factory • Power struggles among users • Cultural rivalry between towns 	<ul style="list-style-type: none"> • No updates for old IS available • No permission to use plant P1's IS • PM's growing IS integration management skills • Negotiations • Evolution of: <ul style="list-style-type: none"> ➢ PM's communication preferences ➢ Professional handling of development and integration process and change requests ➢ Relationships ➢ Exchange of information ➢ Shared language
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CONCLUSION

This longitudinal study provides insights into post-merger IS integration by examining it using an integrated framework consisting of three perspectives: a structuralist, an individual, and an interactive process. Our empirical analysis illustrates how all three perspectives contribute to an understanding of the shape which the actual post-merger IS integration process took and how it evolved. In our case, many inhibitors of success were predicted by the existing literature. Yet the organization was eventually able to bring its post-acquisition IS integration project to a successful end.

While the existing knowledge on IS implementation covers many important issues related to post-merger IS integration, our results emphasize that, in addition to the existing knowledge, researchers and managers of post-merger IS integration should pay particular attention to the IS and organizational merger contexts; the need to build relationships, communication, collaboration, and shared language between the merging parties; the possible surge of more and more varied power struggles; and, most importantly, understanding and treating post-merger IS integration as a complex, messy, and evolutionary process.

Table 8: Nature of Inhibitors of Post-merger IS Integration

Avoidable	Unavoidable
<ul style="list-style-type: none"> • Decision to pursue integration without IS • Decision to limit IS to one plant • Decision to combine IS features • Dissolution of steering committee and functional groups • Top management's lack of commitment and support • CFO's preference of limited communication • PM's preference of limited and one-way communication • Vendor's initial lack of competence in the application area • Choice of initially less-competent vendor • CFO's power exertion with regard to vendor choice • PM's limited power <p><i>Long-lasting and evolving inhibitors in PrintComp's IS integration:</i></p> <ul style="list-style-type: none"> • Vague requirements for the new IS • Errors and alterations in the new IS 	<ul style="list-style-type: none"> • PM's lack of experience from both organizations • New, initially detached relationships <p><i>Long-lasting and evolving inhibitors in PrintComp's IS integration:</i></p> <ul style="list-style-type: none"> • Changing requirements for the new IS • Small IS integration team • Users' lack of skills and their resistance • Power struggles among users • Cultural rivalry between towns

Our results also emphasize the importance of the various "soft" aspects at play. While the "hard" arguments related to, e.g., monetary savings and other financial issues may be appealing to some stakeholders, such as shareholders, our findings show that they alone are not sufficient to guide the decision making of a successful post-merger IS integration. Instead, the decision makers have to consider the contributions of the social context and process to the process and product of post-merger IS integration.

The current case is an initial step toward improving the understanding of what shapes post-M&S IS integration and how is it shaped. As such, its scope is limited and the case context impacted our findings. First, post-hoc interviews always bear the risk of a recall bias that may have affected our findings. We sought to mitigate this risk by comparing accounts among various interviewees and documents. Moreover, our period of data collection started only after the first pilot implementation. To address these biases, future research should use observational methods such as ethnographies and study the whole lifecycle of post-merger IS integration, starting from strategic planning.

Second, the case background was an acquisition with a clear power difference between the organizations. In addition, the acquirer and the acquired are located in the same country, and no differences of national cultures were at play. Focusing on other M&A contexts such as a merger of equals or inter-cultural integrations offer promising avenues for research to adapt and extend these results.

Third, the particular content of change in this case was a full integration via blending together features of existing IS to develop a new, ERP-style IS. Integrations of other IT artifacts, such as other types of software applications, telecommunication networks, or IT architectures, are important topics for research, and so are other integration strategies, such as taking over one party's IS or building bridge-ware.

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APPENDIX A. EXAMPLES OF INTERVIEW QUESTIONS

Semi-structured theme interviews were conducted. The interviews were conducted in the native language of the interviewees. Among others, the interview themes included:

- Integration strategy
 - What integration strategy was chosen? (Full consolidation/partial integration no integration/mixture?) Details? Why?
 - How were these decisions made? (Who, when, Why?)
- Executing the integration strategy:
 - How was it executed? (When was it integrated, who managed the integration, all at once vs. phased, how were the users taken into account, etc.? Why?)
 - How were these decisions made? (Who made them, who participated, when, what changes occurred, etc?)
 - What has been difficult? What problems have been experienced? (How did you get over/cope with these problems, why, etc.?)
 - What opportunities appeared? (How were they exploited? Why? etc.)
- Success
 - How would you define success in this IS integration? Why?
 - To what extent were these success criteria reached? Why?
 - How is this related to the overall integration success at the level of the whole organization? (Goals and reaching them?)

APPENDIX B. THE LITERATURE SEARCH

In the first phase of our literature search, we included twelve reputed, high-quality journals as identified by, e.g., Mylonopoulos and Theoharakis 2001, and Vessey, Ramesh et al. 2002, and by the IS senior scholars (http://home.aisnet.org/displaycommon.cfm?an=1&sub_articlenbr=346): *Information Systems Research (ISR)*, *Journal of Management Information Systems (JMIS)*, *MIS Quarterly (MISQ)*; *Communications of the ACM*, *Information and Management*, *Management Science*, *Harvard Business Review*, *Decision Sciences*, *Decision Support Systems*, the *European Journal of Information Systems (EJIS)*, *Information Systems Journal*, and the *Journal of the Association for Information Systems*. In these journals, we searched for articles that contained the words *merger* and *acquisition*, as they would also cover articles containing words such as *mergers*, *acquisitions*, *post-merger*, and *post-acquisition* in the title, abstract, or full text. **Error! Reference source not found.** summarizes the nine papers found and their findings.

To secure a broader basis for the theoretical background, we thereafter extended our search to other IS journals, in particular with a strategic focus and to academic periodicals from IS reference disciplines as such organizational science, finance, and accounting, and others. To ensure the high quality of the research results, we deliberately excluded conferences, with the exception of the top IS conference, the International Conference on Information Systems (ICIS), from our search. We also studied the reference lists of the articles found in the first search round, and we used search engines and suggestions from colleagues. The nine articles found in this systematic search are listed in **Error! Reference source not found.** The main findings of these studies support those found earlier as a result of the first phase of the literature review and are, therefore, not listed here individually.

Table 9: Key Findings on Post-merger IS Integration from Top IS Publications

Focus	Method	Key results	Reference
Post-merger IS planning	Case study	<ul style="list-style-type: none"> • Merger creates an opportunity for improving IS/business alignment and managing IS through building partnerships with top management. 	Main and Short 1989
Role of IT fit in merger	Case study	<ul style="list-style-type: none"> • The match among the people, organization, IT infrastructure, and the quality of information used to support operation is an important factor in the decision for and evaluation of a merger. 	Buck-Lew et al. 1992
IS integration effectiveness on mergers	Survey	<ul style="list-style-type: none"> • Exploiting IS integration synergies is affected by organizational differences. • Firms with high IS integration engagement out-perform those without high engagement. • Large cultural differences between organizations are negatively associated with merger effectiveness. 	Weber and Pliskin 1996
Success factors of post-merger IS integration	Survey	<p>Positive factors:</p> <ul style="list-style-type: none"> • Past integration experience • High quality merger and IS integration planning • Top management support • High-quality end-user communication • High level of end-user involvement in strategic IS integration decision-making process • Emphasis on IS standardization <p>Negative Factors:</p> <ul style="list-style-type: none"> • Large number of changes in IS policies and procedures • Programming language incompatibilities 	Stylianou et al. 1996
Factors influencing strategic decision-making for post-merger IS integration	Survey	<p>A mix of both technical and organizational factors:</p> <ul style="list-style-type: none"> • Management need relating to kind of business • Simplicity of integration with regard to location (same country) • IS architecture (centralized architecture) • Integration of databases • Achieving economies of scale 	Giacomazzi et al. 1997



Antecedents for effective post-merger IS integration	Survey	<p>Positive factors:</p> <ul style="list-style-type: none"> • Past integration experience • High quality merger and IS integration planning • Top management support • High-quality end-user communication • High level of end-user involvement in strategic IS integration decision-making process • Emphasis on IS standardization 	Robbins and Stylianou 1999
Knowledge-sharing in post-merger IS integration	Case study	<ul style="list-style-type: none"> • Mergers present a discontinuity in knowledge-sharing. • Chosen strategies often mirror one of the merging companies and match poorly with the post-merger needs. • Lack of shared context, incompatibility of existing systems, tacit knowledge and time pressures of merger contribute to knowledge gap. • Employees enact knowledge sharing practices significantly different from official strategies. 	Yoo et al. 2007
Business/IS alignment in post-merger IS integration	Case study	<ul style="list-style-type: none"> • Firms are misaligned in the early post-merger period and come to alignment a few years later. • Business/IS alignment is a minor concern during pre-merger and early post-merger phases. • Business/IS alignment is a concern only in later post-merger periods. • Prior merger experience, overarching synergy goals, power struggles, drive the initial IS integration decision making. 	Mehta and Hirschheim 2007
Effect of post-merger IS integration capability on merger performance	Survey	Acquirers with a higher post-merger IS integration capability obtain higher post-merger performance.	Tanriverdi and Uysal 2010

Table 10: Additional Literature Search Results: Post-merger IS Integration Literature in Other IS-related Publications

Outlet	Reference	Title
<i>Journal of Strategic Information Systems</i>	Jelassi and Dutta 1993	"Integrating global commercial operations with information technology at BP Chemicals"
<i>Journal of Strategic Information Systems</i>	Merali and McKiernan 1993	"The strategic positioning of information systems in post-acquisition management"
<i>Long Range Planning</i>	McKiernan and Merali 1995	"Integrating information systems after a merger"
<i>Journal of Strategic Information Systems</i>	Johnston and Yetton 1996	"Integrating information technology divisions in a bank merger fit, compatibility and models of change"
<i>Accounting, Auditing & Accountability Journal</i>	Granlund 2003	"Management accounting system integration in corporate mergers—A case study"
<i>Journal of Global Information Management</i>	Chin et al. 2004	"The impact of merger & acquisitions on IT governance structures: A case study"
<i>Journal of Strategic Information Systems</i>	Wijnhoven et al. 2006	"Post-merger IT integration strategies: An IT alignment perspective"
<i>Information Systems Frontier</i>	Alaranta and Henningsson 2008	"An approach to analyzing and planning post-merger IS integration: Insights from two field studies"
29 th International Conference on Information Systems, 14–17.12.2008, Paris, France	Vieru and Rivard 2008	"The dilemma of integration versus autonomy: Knowledge-sharing in post-merger IS development"

APPENDIX C. AN EXAMPLE OF CONSTANT COMPARISON

The following example from our analysis illustrates our approach and brings some transparency to our research approach. The vendor's project manager complained about the lack of sponsorship from PrintComp's top management and commented that "... *the responsibility shifted to the end users ... it must be the [PrintComp's] project team that bears the responsibility. This has been the problem here.*" PrintComp's end-user survey revealed that management commitment was also invisible for the end-users and thus confirmed the vendor's perception concerning management support. In our interpretation, we further linked the end-user surveys and the IS vendor's statement to Print Comp's integration project manager's behavior. Without proper backing from management, the project manager used the end-user surveys to champion his demands in negotiations with the vendor, in particular in situations where he did not have enough power himself. That is, the project manager assigned significant responsibility to the end-users. This kind of analysis and interpretation was carried out for each node and led to the narrative account which forms the background for the sections on the "Case Setting" and "Analysis of the post-acquisition IS integration process."



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