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Managing Information Systems Integration in Corporate Mergers and Acquisitions

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Malmö, April 4, 2008

Stefan Henningsson

Ps. Thomas, I have not given up on "Chiquitita" yet… ds.

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Recurring abbreviations

CEO – Chief Executive Officer

CIO – Chief Information Officer

CIM – Computer Integrated Manufacturing

CRM (system) – Customer Relationship Management (system)

EAI – Enterprise Application Integration

EI – Enterprise Integration

ERP (system) – Enterprise Resource Planning (system)

ES - Enterprise System

ESB – Electronic Service Bus

FTC (-framework) – Federal Trade Commission (-framework)

IS – Information System

IT – Information Technology

M&A – Merger & Acquisition

MIS – Management Information Systems

MRP (system) – Materials Resource Planning (system)

OI – Organizational Integration

OL – Organizational Learning

SCOR – Supply-Chain Operations Reference

SOA – Service Oriented Architecture

TA – Trelleborg Automotive

TBS – Trelleborg Building Systems

TES – Trelleborg Engineered Systems

TSS – Trelleborg Sealing Solutions

TWS – Trelleborg Wheel Systems

PART I:

Outset and framing

1. Introduction

When, in 1996 the Swedish industry group, Trelleborg AB, acquired the French hose manufacturer, CMP/Kléber it took more than ten years until the two units had become integrated in their information systems (IS). Until the IS had been integrated the two organizations could not function as one common unit and consequently could not leverage the synergetic effects that had motivated the acquisition in 1996. In 2006 the group acquired another French hose manufacturer, Dynaflex, and the necessary IS integration was then implemented three months after the acquisition deal was struck. In a world where commercial organizations are expected to deliver results in each quarterly report, the difference between three months and ten years is monumental. In addition, the time difference represents a significant difference in resources used to make the organizations come together.

History indicates that of the about 38,000 corporate mergers and acquisitions (M&As) that were carried out in 2006, roughly speaking two thirds will be financial failures (Bekier et al., 2001; KPMG, 2001). When an organization acquires or merges with another organization it does so based on the principle that together the two units can be run more efficiently or effectively than apart, but expected synergetic effects have been shown difficult to leverage in reality. Often the problems of leveraging anticipated benefits are ascribed to difficulties in integrating the two companies' IS (Evgeniou, 2002). As in Trelleborg's acquisition of CMP/Kléber, expected benefits cannot be realized before the units to be combined come together and function in an integrated manner. Since modern enterprises are highly dependent on their IS for carrying out business activities, they cannot function in an integrated manner before the IS are appropriately integrated (Giacomazzi et al., 1997; McKiernan & Merali, 1995; Robbins & Stylianou, 1999; Stylianou et al., 1996; Batelaan & Veltman, 2002; Franck, 1990; Group, 1999; I/S-Analyzer, 1989; Alaranta & Henningsson, 2007).

The topic of this thesis is management of IS integration in the context of corporate Mergers and Acquisitions (M&As). Integration in various contexts has been on IS managers' agenda since the early

1970's, starting with the introduction of Management Information Systems (MIS) (e.g. Adelberg, 1975; Gilman, 1977; Lidd, 1979; Agarwal & Lucas Jr, 2005; Weingard, 1979; Lusa et al., 1979). Since then companies have engaged in a continuing quest for the promise of global IS that enables more efficient ways of doing business (Hanseth, 2000; Hanseth & Braa, 2001). At its best, integrated information that flows in the global IS provides every part of the organization with unlimited information access that enables numerous benefits, including organizational flexibility, increased productivity, integration of business processes, improved quality and standardized quality of output (Hedman & Kalling, 2003).

As companies become more and more dependent on various forms of IS support, complex information infrastructures have emerged and intensified the importance of IS integration issues (Hanseth & Braa, 2001). For some years, integration issues have been given highest priority on the IT-managers agenda. In The State of the CIO 2006 survey that included 500 heads of IT, for the year 2007 the top technology priority was to integrate systems and processes (CIO-Magazine, 2006). 57% of the respondents answered that they intended to increase the resources devoted to integration. Ongoing IS integration (and disintegration) has for contemporary businesses become a part of everyday life, partly because of the constantly shifting boundaries between companies using M&As as an integrated part of their growth strategy (Evgeniou, 2002).

1.1 When integration becomes a part of everyday business life…

One of the main reasons that the vision of the fully integrated enterprise-wide IS never became a reality was the constant shifts in organizational boundaries as companies expanded, narrowed or refocused their businesses. (Evgeniou, 2002; Hanseth & Braa, 2001). In the contemporary business world, having M&As as a means of shifting the organizational boundaries has developed into a major tool for corporate strategy (Sirower, 2003). In 2006, the 39,000 completed and pending M&As represented an overall transaction value of € 3,100 billion, a sum that amounts to about one-third of the current total gross domestic product for the European Union or the US. Since 2003 the

number of deals, their aggregated value, as well as the average price paid has increased every year (Vaishnavi & Kuechler Jr, 2008). However, despite the popularity of M&As, history proves that the endeavor is a risky and complicated process. Findings in a A. T. Kearney study from 1990 to 2000 on stock performance reveal that in the two years after a deal is closed, nearly 30 percent of the M&As fail to produce shareholder returns at the same level as their industry peers (Perry & Herd, 2004). Similarly, KPMG and McKinsey report on separate surveys that 60% of the M&As did not create shareholder value for the participating companies, nor did they increase their growth appreciably (Bekier et al., 2001; KPMG, 2001). Also, the business press states that "acquisition research studies indicate that between 60 and 80 percent [of M&As] are financial failures" (Norton, 1998) that destroy shareholder wealth (Henry, 2002). The high failure rates articulate that many lessons on M&As are still to be learned.

An understanding of the role of IS in M&As is still very limited (Alaranta & Henningsson, 2007; Mehta & Hirschheim, 2004; Brunetto, 2006; Wijnhoven et al., 2006; Mehta & Hirschheim, 2007). This is naturally reflected in the business community. In a recent survey by Accenture, only 40% of 400 interviewed enterprises reported that their last M&A related IS integration had been successful (ComputerSweden, 2006). The business press reports that IT issues are the third most cited reason for unsuccessful M&As and that generally some 45% of the expected benefits from an M&A are directly dependent on the IS being integrated (Rodgers, 2005). Whatever "successful" actually means in this context, it is an apparent statement indicating that something is not working in the way it should.

Theoretically, the research domain of IS integration in M&As is fragmented with isolated contributions that at its best introduce tentative models for various aspects of the integration process based on limited empirical studies (Wijnhoven et al., 2006). "At best, the current literature has found some factors that seem to influence IT integration success (Giacomazzi et al.,1997; Stylianou et al., 1996; Robbins and Stylianou, 1999), describes a number of practical experiences (Batelaan and Veltman, 2002), and recognises the importance of IT-integration during mergers (Harrell and Higgins, 2002)." (Wijnhoven et al., 2006, p. 6) Several authors point out the limited understanding of IS in M&As and the significance for contemporary business life (Giacomazzi et al., 1997; McKiernan & Merali, 1995; Robbins & Stylianou, 1999;

Stylianou et al., 1996; Batelaan & Veltman, 2002; Franck, 1990; Group, 1999; I/S-Analyzer, 1989; Alaranta & Henningsson, 2007). Similarly, it is strongly argued that there is an academic need for extending the theoretical aspects of M&A to include the role of IS integration, and from an IS integration point of view, there is a need to address M&A implications for IS integration approaches (Wijnhoven et al., 2006; Evgeniou, 2002).

Based on the development of IS integration into one of the more topical challenges for IS managers and the need for both practice and academia to increase the understanding of IS integration in the context of M&As, this thesis addresses management of IS integration in M&As. In the remainder of this first chapter the areas of inquiry and this study's contributions in relation to existing work will be sketched out. However, within both the fields of IS integration and M&As, some of the core concepts are often used with multiple meanings in the existing literature. Accordingly, the next section clarifies the meanings of some of the more indistinct concepts used in the literature.

1.2 Definitions of key concepts

To facilitate reading, an explanation of the meanings and use of key concepts that are used in this thesis follows.

1.2.1 Mergers and acquisitions

The word 'merger' suggests a neutral combination of two objects while 'acquisition' is derived from the verb 'acquire' and has a meaning of takeover. Mergers usually involve companies of equal size, while in acquisitions the acquiring company tends to be of larger size than its counterpart (Krekel et al., 1969). A commonly used distinction between the two concepts is the juridicial distinction, related to changes in ownership and juridicial body. The distinction applied here, however, is not with the juridicial meaning, as that would have no relevance organizational processes (Mohr, 1982; Giacomazzi et al., 1997). The key factor is the extent to which one firm is expected to give up its independence to the other (Krekel et al., 1969). The meaning of acquisition as a transfer in ownership is here avoided; instead, it is referred to as 'purchase.' Similarly, the transfer of

ownership that potentially could have been meant by merger is here referred to as 'fusion.'

The combined term Mergers & Acquisitions (M&As) has evolved into a specific research domain; accordingly, many researchers choose to study the variations as one single phenomenon. To add to the confusion, the word merger can be used in a common sense meaning, referring to any combination of two or more entities. This denotation is avoided here to restrict confusion between the word merger in a common sense meaning and the concept of merger as a combination of two organizational entities. Apart from referring to the acquisition of another company, acquisition can also refer to the acquisition of smaller assets. Acquisition of smaller assets is not the meaning intended in this thesis. Thus, '*merger' and 'acquisition' in this thesis refer to two idealized states, the neutral combination of equals and the takeover of a less powerful organization by a more powerful organization*. In reality, combinations seems to fall somewhere between the two extremes. Since the topic of this thesis is management of IS integration in M&A, "powerful" refers to the ability to manage the M&A. A more in-depth discussion on these concepts can be found in section 3.1.

1.2.2 IS integration

The meanings of 'information' and 'system' are elaborated upon in Chapter 2. This thesis draws upon the definitions of Iivari (2005) and Gustafsson et al. (1982) to defines an information system (IS) as *an IT-based a system whose purpose is to supply its groups of users with information about a set of topics to support their activities*. Motivation and a further explanation of implications of the definition can be found in section 2.1.

The word integration has been used with at least four distinct meanings in the IS literature: a process, a condition, a system, and an end-state (Gulledge, 2006). In this thesis in the context of "IS integration," the term 'integration' is used in the sense of a *process leading up to integrated systems*. Conceptually speaking, *integrated systems are systems that work together even though they never were intended to do so*. Approaches for arriving at this state are addressed in section 2.4. Prior research shows that success or failure of the IS integration process in M&As is not a matter of arriving at integrated IS, but a matter of

resources and time spent and how well the IS integration matches the business requirements (Mehta & Hirschheim, 2007).

Finally, managing IS integration in M&As refers to the understanding of how IS integration relates to the M&A context and being able to decide and act upon the understanding. Drawing on general IS management research (Clemons & Row, 1991; Gottschalk, 2000; Kalling, 2003; Mata et al., 1995; Walls et al., 2004; Pyburn, 1983; Weill & Broadbent, 1998) and research on IS and IT governance (Walls et al., 2004; Van Grembergen, 2005; Webb et al., 2006; Willcocks et al., 2006; Brown & Grant, 2005), IS integration management is refined into two tasks: a) the basic, structural options of IS integration, and b) the options effects on the business of the organization. IS/IT management and governance research is further discussed in section 2.3.

1.3 What is known and not known about IS integration in M&A

As mentioned earlier, the topic of this thesis is management of IS integration in M&A. The act of an M&A seems at first glance to offer an attractive alternative for corporate strategy, but the leveraging of potential combinational benefits are often overshadowed by the cumbersome and resource demanding integration process (Buono & Bowditch, 1989; Lubatkin & Lane, 1996; Shrivastava, 1986). Integration work related to M&A can be studied from several relevant perspectives, focusing, for example, on human reaction (Cartwright & Cooper, 1993a; Napier, 1989), cultural integration (Marks, 1982; Franck, 1990), M&A management (Haspeslagh & Jemison, 1991; Schweiger, 2002) or the value creating ability (Lubatkin, 1988; Lewellen, 1971). One of the relevant aspects to study is the issue of making IS that never were intended to work together to do so, as most strived for benefits can never be realized without the effectuation of IS integration (Alaranta & Henningsson, 2007; Mehta & Hirschheim, 2004).

The next section adresses these areas of inquiry in greater detail and elaborates upon the scientific contribution to the field that this thesis makes.

1.3.1 The M&A act

The problem of leveraging the synergetic potential of M&As is well documented in the academic literature. Already in 1929 the American National Industrial Conference Board noticed the problem (NICB, 1929). Since that time, research on the topic has been conducted along three broadly defined strands (Larsson, 1990; Risberg, 2003): 1) M&A as a tool for corporate strategy, 2) the issue of organizational compatibility between the two companies, and 3) the events and activities during the M&A process, with special attention given to the process of integrating participating organizations.

The strand of M&A research that regards the act from a strategic perspective is tightly tied to the concept of synergy, meaning the combinational potential of merging two organizational units. This strand has focus on the identification of positive outcomes of organizational combination. It has been argued that one significant reason why M&As fail to produce the economic benefits as anticipated is simply because of imaginary synergies (Lubatkin, 1988). What at first glance may appear to lead to cost savings or increases in revenue may eventually prove illusionary. Numerous studies have identified potential synergetic effects in technical (marketing, production, experience, scheduling, banking, compensation), pecuniary (monopoly, monopsy), and diversification economies (portfolio management, risk reduction) (Lubatkin, 1988). Several typological frameworks for capturing actual synergies exist to guide business professionals and academics. The most well-known and frequently used is probably the FTC-Framework (Federal Trade Commission, 1975) which classifies M&A into *horizontal*, *vertical*, *product concentric*, *market concentric,* and *conglomerate* categories, based on relations of products and markets of the merging units.

As more and more empirical data points to most M&As failing to leverage their synergetic potential, a new dimension has been added to the field of M&A research – organizational fit. Researchers have found that the resources and time needed to integrate the two organizational units often overshadow the benefits received. Organizational fit targets how well two corporations match in their respective administrative systems, corporate cultures, personnel characteristics, and other organizational aspects (Jeminson & Sitkin, 1986). The compatibility is seen as decisive for M&A outcomes. Compatibility has been addressed

from many different angles, including financial fit, business style fit, fit of assets, management styles, and cultural fit (Risberg, 1999).

If the first strand can be said to address the potential upsides of an organizational combination, the second strand addresses the hampering characteristics of the combining organizations. However, even though there is a sound initial setup, the success is not at all guaranteed. The third research strand on M&A recognizes that in addition to initial conditions, a supplementary factor that is decisive for the outcome is the M&A process itself. Some researchers argue that this is even more important than the initial condition (e.g. Larsson & Lubatkin, 2001). Figure 1.1 outlines a generic model of how the M&A process moves through different phases. Apart from the three-phase model by Haspeslagh and Jemison (1991), the progression has been described in models with four (Graves, 1981), five (Aiello & Watkins, 2000), six (Breindenbach, 2000), and even seven phases (Buono & Bowditch, 1989). Conceptually, however, they all conform to the same logic as depicted in Figure 1.1. In a pre-M&A phase organizations are preparing and planning for the act, while after the deal is closed, the real work of making the two units function together begins. In the literature, pre-M&A issues have attained the greatest attention. After investigating over 500 articles from leading M&A-journals, Parvinen (2003) found that only 18% dealt with post-M&A issues.

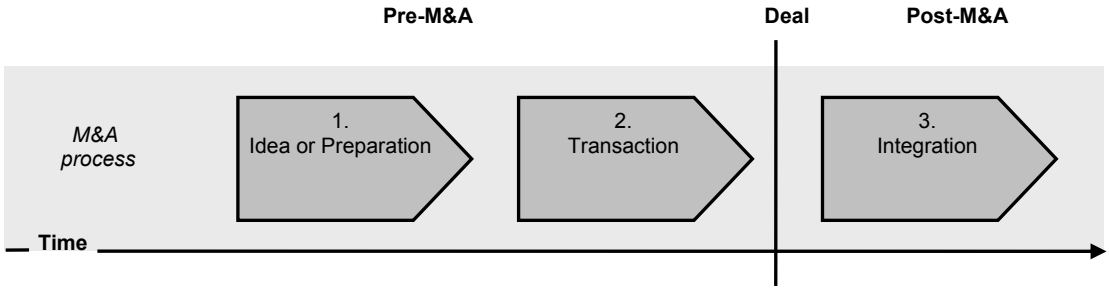


Figure 1.1 The M&A integration process according to Haspeslagh and Jemison (1991)

In conclusion, it can be said that the amount of literature dealing with general aspects of M&A is extensive. There is a plethora of theories that seek to explain why M&A work or fail. However, the M&A process is multifaceted and complex. No single approach can render a full

account (Trautwein, 1990). In addition, as the condition for contemporary business changes, so does also the need for explanatory theory. It is known that the number of M&As is steadily increasing from an already high level (Vaishnavi & Kuechler Jr, 2008). It is further reported that a substantial share of those M&As actually fails to deliver economic values (Accenture, 2006; Bekier et al., 2001; Norton, 1998; Perry & Herd, 2004). It is not known why, and more importantly for the businesses with M&As as a part of their growth strategy, nor is it known how the rates can be improved in the future.

The next section outlines the efforts made to include into M&A theory the increased importance of complex IS basis for modern business.

1.3.2 IS integration in the M&A process

IS integration is a topic viewed from many different contexts. In inter-organizational integration it refers to connecting a company with its customers, suppliers, or collaborative partners. It is also a topic in intra-organizational integration as inconnecting internal business activities and functions together. This thesis is limited to IS integration as a constituent of the M&A process, focusing IS integration decisions and actions that can be directly related to the M&A context.

In the academic literature and the business press there are numerous examples of cases where problems in integrating the combining units' IS significantly affect the financial outcome of the M&A. The USA waste Inc.'s $20 billion acquisition of Waste Management Corp. in 1998 was said to be malfunctioning because of failure to integrate the two companies IS (Shearer et al., 2004). Similarly, Lloyds and TSB were unable to integrate their back-office systems, resulting in bank tellers being unable to access a common set of banking services. Thus, expected synergies were not realized (Goodman, 2000). In the merger of US railroads of Union Pacific and Southern Pacific in 1996 the approach was to gradually migrate Southern Pacific's aging IS to those of Union Pacific, but this resulted in unanticipated parallel processing for more than a year. During that time the 100,000 freight cars frequently "disappeared," with customers unable to locate their shipments. The total estimated cost of these integration problems was estimated $2 billion.

On the other hand, the success story of Sallie Mae's acquisition of USA Group gives a good example of how appropriate handling of IS integration can contribute to the leverage of synergetic potential (Brown et al., 2003). It would be no exaggeration to say that today's business is completely dependent on various forms of IS (Weill & Broadbent, 1998). The issue of IS integration in M&A is thus even more important as enterprises become more and more reliant on their IS (Hwang 2004). Not very controversially, the research community has produced the conclusion that organizational integration cannot be achieved, and thus no leverage of synergetic potential, until the IS has been integrated (Batelaan & Veltman, 2002; Group, 1999; Analyzer', 1989; Franck, 1990).

Several authors note that the literature on IS and M&A is case-specific and anecdotal in nature; almost exclusively, articles appear in practitioners' rather than academic journals (McKiernan & Merali, 1995; Mehta & Hirschheim, 2004; Merali & McKiernan, 1993; Stylianou et al., 1996). More recently, academic interest in the topic has increased, resulting in a handful of contributions dealing with different aspects of IS integration in M&A. A first generation of explorative character emerged in the early 90s. These articles purported that IS integration had a major impact on the final outcome of the M&A, an impact that was not fully recognized in the business practice (Buck-Lew et al., 1992; McKiernan & Merali, 1995; Merali & McKiernan, 1993; Weber & Pliskin, 1996). A common conclusion was that IS integration was a post-M&A issue, dealt with reactively. Initial empirical findings indicated that IS integration needed to be addressed and due diligence given to maximize chances for a positive outcome (McKiernan & Merali, 1995; Merali & McKiernan, 1993; Weber & Pliskin, 1996).

The current status of the field includes a second generation which to a varying extent builds on the pioneering works (for a complete listing, see Appendix A). As the empirical phenomenon still remains quite unexplored, a common approach is to extend potentially relevant theories from related phenomena and validate the extension with a minor study (e.g. Alaranta & Henningsson, 2007; Giacomazzi et al., 1997; Henningsson, 2005b). This second generation of articles also includes empirical work that builds on the first generations explorative findings and classification of the phenomenon. These works have produced fairly isolated pieces of tentative theory that the authors find

potentially relevant, but is in need of further investigation (see Alaranta & Henningsson, 2007; Giacomazzi et al., 1997; Gurjar et al., 2002; Mehta & Hirschheim, 2004; Robbins & Stylianou, 1999; Stylianou et al., 1996; Henningsson & Carlsson, 2006b). For further description of the theoretical contributions, see Chapter 4. The second generation's contributions are interesting and illuminate new aspects of IS integration in M&A to shed light on the phenomenon, but, as the authors state, theoretical construction in this area is still in a formative stage where the underlying literature reviews are based on a handful of studies, and models are founded on sparse empirical investigation.

It is thus known that IS integration plays an important role in M&A, but it is not known exactly which role this is and how significant it is.

1.3.3 IS integration management

Despite the demonstrated importance and risk of neglecting integration issues in the M&A process, investigations show that IS questions normally receive noticeably little attention in practice. IS integration is currently only considered after a deal is closed when the managers are left with the often extremely difficult task of integrating two fundamentally different IS environments (Stylianou et al., 1996; Consulting, 2000; Shearer et al., 2004). IS management can be summarized as having one focus on the basic structural options of IS and one focus on the options' consequences for business (see section 2.2). To outline and discuss managerial aspects of IS integration in M&A, we use the M&A process model by Haspeslagh and Jemison (1991). Figure 1.2 depicts the process and the related IS integration tasks that can be imagined to exist. Current research outlines IS integration problems that are prevalent during this whole process, from the initial contacts taken to the time when two organizations have reached a stable integration level. Problems that have to be solved during the first phase include improvement of preconditions (the task of creating an IS solution that is possible to integrate with another IS) and determining which IS integration is desired in the organization after the M&A (Giacomazzi et al., 1997; Weber & Pliskin, 1996). In the transaction phase questions arise regarding the match of the two organizations' IS. Will it be possible to accomplish integration and which problems are likely to occur (McKiernan & Merali, 1995; Mehta

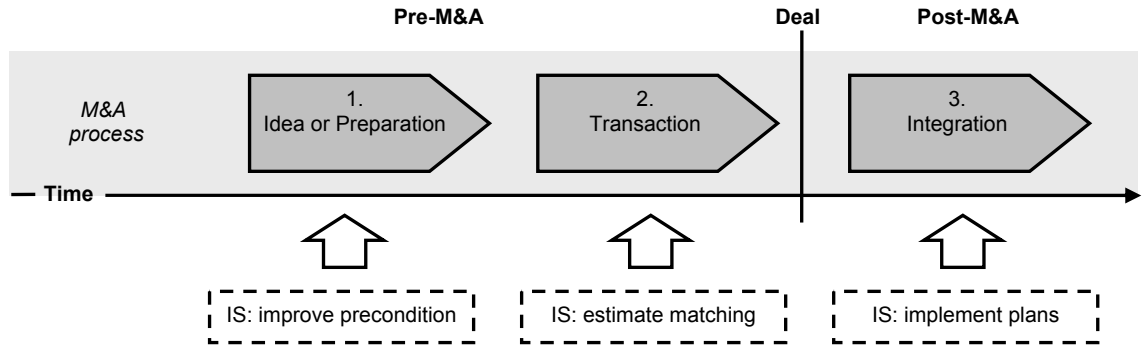


Figure 1.2 The M&A integration process according to Haspeslagh and Jemison (1991) and critical IS-related tasks during the process.

& Hirschheim, 2004)? The third phase encounters problems with the activities of actually implementing the desired IS integration solution (Shearer et al., 2004; Stylianou et al., 1996).

All phases include problems related to the management of the IS integration processes that may be addressed in different ways. However, as indicated above, in most cases IS managers are only involved in the process after the deal has been closed. Accenture (2002) surveyed how European and North American companies addressed IS integration in M&A and found that only 16% of companies involved IS management in pre-M&A phases. In addition, the companies that do address IS integration prior to the closure of the deal have to address the question based on experience and logical reasoning, as theoretical contribution is still tentative. The second-generation of research on IS integration in M&A (briefly depicted above and more profoundly presented in Chapter 4) does not include the means for managing IS integration through the M&A process. Further, existing general IS development methodologies and frameworks normally focus on development of IS from scratch and are not created with such initiatives as IS integration in mind (e.g. Avison & Fitzgerald, 1995; Baskerville et al., 2007). Since IS integration refers to building on what already exists, it is thus essentially different from developing IS for an organization which previously did not use any IS in its operations.

All in all, further research into the management of IS integration in M&A - the topic of this study - has been motivated by the still frequently miscarrying numbers of M&A, together with the numerous

stories in the academic literature and the business press about how difficulties in IS integration hampers the leverage of synergetic potential, as well as the absence of appropriate theory covering the field as claimed by those who have started to implement it.

It is thus recognized that IS integration plays an important role in M&A, but what is not known exactly is the scope of the role and the significance of it (see p. 13). Further, it is known that the problem for IS managers in an M&A involves choosing among structural options of IS integration based on the contextual requirements posed by the M&A context. It is not known what the structural options actually are, nor is it known how the choices are related to the M&A process.

1.4 Purpose and knowledge contribution

The following section refines the loosely defined topic into a specific purpose of the thesis and specified research questions. Further, the contributions and the scope of the study are discussed.

1.4.1 Purpose

In outlining the areas of inquiry, two related gaps have been identified. The first gap is the lack of theory that appropriately explains the relationship between IS integration and the general M&A process. The importance of the relationship has been emphasized, but the fragmented and tentative research efforts has not been able to explain the connection. The second identified gap is the lack of theoretically grounded knowledge that could assist in the management of IS integration in M&A. Managerial tasks related to IS integration are evident throughout the whole M&A process, and are of high importance to the final outcome. It is by filling these two identified gaps that this thesis makes its contributions.

IS research should not only be rigorous but also need to address the utilization and relevancy problem of current research (Hirschheim & Klein, 2003). To increase utilization and relevance, mainstream IS research, based on behavioral science, can favorably be complemented with research based on design science (Hevner et al., 2004; Walls et al., 1992; Venable, 2006). Providing IS professionals with the means they need in their profession is one of the desired outcomes of design science

(Carlsson, 2006). In the case of IS integration in M&A, these means would support IS managers in understanding the relationship between the general M&A context and the IS integration in order to make decisions and take action in the process. The creation of such means relies on the theoretical status of the field. Theories represent accumulated and systematically structured understanding that can enlighten professional practice (Gregor, 2006). What is produced in the design-science research process relies on existing kernel theories (Iivari, 2007). The lack of theories that explain the relationship between IS integration and M&A, and the lack of means to support the management of the relationship are thus two tightly related problems that need to be addressed by IS researchers.

Based on this discussion, the purpose of this thesis is twofold. First, as a consequence of the current status of the research field, this thesis seeks to *develop theory that explains the relationship between IS integration and the general M&A process*. The first outcome is theory for understanding, a theory category that includes knowledge of the *how*, *why* and *when* of the phenomenon (Gregor, 2006). Noteworthy is that the thesis does not address all aspects of the how, why, and when of IS integration in M&A, but aims to make a contribution within this category of theories. In order to advance to accomplish this purpose, two specific research questions are posed:

> R1: Which aspects of IS integration and M&A are important to understanding IS integration in the context of M&A?
>
> R2: How do the different aspects of IS integration and M&A relate to each other?

The link between a specific aspect of M&A and a specific aspect of IS integration is seen as a *relation*. The phenomenon of IS integration and M&A have a set of relations between each other which is here labeled the *relationship* between IS integration and M&A. By "aspects of IS integration and M&A" it is meant that both an IS integration and an M&A process has certain specific characteristics. For an IS integration this refers to things like IT architecture used and which kind of IS isbeing integrated. For the M&A process, characteristics could refer to which synergetic benefits are strived for and the desired level of organizational integration. The first research question incorporates the most significant characteristics. 'Most significant' refers to the mutual

dependency between IS integration and M&A, and the explanatory power of the characteristics. The second research question is thus interrelated with the first in that the reason for understanding the phenomena encompasses being able to depict how they affect each other. In other words, an answer to the second question would invove the interdependencies that exist between IS integration and M&A. To be able to give such an answer, to point out the interdependencies between properties of IS integration and properties of M&A, the two notions IS and M&A need to be represented conceptually, with exemplification of how the two phenomena influence each other. That is what the first research question addresses.

In addition to the explanatory theory, this thesis also seeks to develop prescriptive theory (Gregor, 2006). Prescriptive theory includes methodologies, methods, principles and other artifacts that say something on *how to do* something (Gregor, 2006). With the use of the explanatory theory as kernel theory, the purpose of the second part of this thesis is to *support management of IS integration in M&A*. This second aspiration is pursued by posing a third research question:

> R3: Given the output from research questions R1 and R2, how can this understanding be expressed as knowledge that supports IS professionals concerned with IS integration in M&A?

Addressing this question should provide information on how to do something (c.f. Gregor, 2006), "something" in this case being management of IS integration in M&A. With the current status of the research field, and based on the principal order that proposed that prescriptive elements should be built on explanatory theory, the most intense focus needs to be on the construction of explanatory theory. As a logical consequence the major contribution of this study will be explanatory theory on the relationship between IS integration and M&A and a minor contribution will be in the form of support to the management of the matter.

The above described contributions should be highly relevant for both IS professionals and the academic society. Absent conception of the relation between IS integration and M&A initiatives is reflected in the business community. The numerous stories of how managers struggles with IS integration issues in their M&A activities shows that there is a lack of means to tackle the question. Logically, this study's

proposed contributions should be of high relevance to the business society.

From an academic perspective, it should be acknowledged that corporate M&As contain important empirical phenomena of which much is still not understood. It has also been suggested that the integration process itself is an important factor for successful integration. Little is known about the processes related to IS integration in M&As and there is a paucity of theory that covers the phenomenon. Therefore, a theoretical contribution in this area would be relevant for the academic society. This is confirmed by Henningsson (2006a) who after investigating existing literature in the field, concluded that the lack of understanding of when and why IS integration becomes an important factor in M&A severely hampers progress in the academic field. By neglecting the differences between different types of integration projects, studies in the domain automatically derive an unnecessary fuzziness. Higher precision in empirical studies, meaning higher relevance of selected cases while studying specific aspects of IS integration in M&A, can be achieved by understanding the relationship.

1.5 Methodological considerations and study delimitations

Thus far the intention, purpose and research contribution of this study have been discussed. Defining the point of view and scope may make the delimitations clearer. The answering of the three research questions is tightly linked to the methodological considerations of the study, that is, how the purpose is achieved.

1.5.1 Perspective and level of analysis

The view of IS and M&A in this thesis is an emergent view, rather than a view of one phenomenon being the consequence of the other (c.f. Markus & Robey, 1988; Orlikowski & Iacono, 2001). The view is not that IS integration is simply a tool formed as a consequence of M&A, nor that the M&A is a consequence of IS, rather that the organization and IS emerge in an intertwined process and should be mutually adjusted. Thus, when talking about the relationship between IS

integration and M&A, or the dependency between properties of IS integration and properties of M&A, these are regarded as interdependencies. For example, the introduction gave examples of how the strived for objectives in an M&A could have consequences for which IS integration is required. This could just as well be seen as certain types of IS integration enabling the leverage of certain M&A objectives. Thus, the emergent view of IS integration in M&A signifies that the dependencies between IS integration and M&A are not in terms of dependent and independent variables (a value in variable X gives a certain value in variable Y), but rather of interdependencies between specific aspects of IS integration and M&A.

Problem definition, purpose expression and formulation of the research question in an M&A have long preoccupied IS managers. This encapsulates the research relevance of the investigation of a real world problem. The second purpose above states an interest in design science. Consequently, the approach to IS integration in M&A strives for comprehensiveness rather than too great a focus on fragmented theoretical contribution.

A simplification of the management process for this thesis is based on the view of M&As as economic motivated processes that should increase the value of the involved companies. The value seen from an economic perspective could be contended to be only a part of the story. The synergetic potential is the starting point from a managerial perspective, and success refers to an economic thinking where the aim of the M&A boils down to increased value for shareholders (Trautwein, 1990). It should be acknowledged that organizations include several stakeholders other than shareholders, and include several perspectives other than economic. No single view can give a complete account (Trautwein, 1990). M&As normally affect a range of stakeholders, for example, managers on different levels, employees, industry peers, communities and even nations. The use of economic rationality has been questioned as an explanation of why M&As take place (e.g. Lubatkin, 1988; Risberg, 1999). However, the relevance of applying the economic perspective here is not directly related if the fundamental drivers behind M&A decisions are economic. The appropriateness of relating IS integration to an economic view of M&A should be considered based on the fact that M&As do take place and that for many stakeholders it is within their interest that a relationship with IS integration takes place. However, assuming the theoretical perspective

on M&A as economically rational acts, it would be virtually impossible to completely ignore the fact that some stakeholders for sometimes very understandable reasons do not act according to the economic rationality of the company. Although this is outside the scope of this thesis, nevertheless, these forces are approached in the view of how they influence the economic progression.

M&As are multifaceted processes that may be studied from numerous perspectives that reveal interesting insights. Clearly, in this study the IS integration and related consideration is the point of view taken. Also, aspects of IS integration throughout this document are treated with the M&A process in mind. IS related phenomena may be studied on either the organizational, infological or technical level (Iivari, 2007). To leverage the expected benefits of an M&A, participating organizations must undergo an organizational change process in which the value of IS integration is determined by its contribution to realizing synergies. By adopting this point of view, infological or technological aspects of IS integration receive lesser relevance in favor for the greater relevance of the integration's possibility to contribute to organizational objectives. The level of analysis in this study is therefore fundamentally organizational. When approaching an IS phenomenon on an organizational level it is not possible to ignore the specific characteristics of the IS as subject of study (Orlikowski & Iacono, 2001). Specific characteristics of IS are in this study regarded by their effect on organizational objectives. Similarly, the way that individual and inter-organizational aspects are incorporated in this study is by relating them to the organizational level.

1.5.2 Scope

The delimitations of this study are tightly related to the definitions of the study's core concepts of IS and M&As. Sometimes in the literature IS is defined as a purely technical system, processing data in a mechanistic way (e.g. Alter, 1999). Such a definition would imply that IS integration is a purely technical implementation. Based on the discussion above on perspective and level of analysis, the definition used here is broader, considering that the IT system is but one part of the IS (see sections 1.2 and 2.1). IS integration also includes integration of human resources and procedures. The applied definition also implies

that the integration has to be studied from its possibility to fulfill an organizational need.

IS integration is not the only relevant integration before and after M&As. However, other (organizational) integration is only addressed from the perspective of implications on the IS. It makes sense to identify which business processes should be supported by the IS (it also lays within the IS definition to do so), but for the purpose of this study discussing how business processes could be redesigned is outside of the scope of the thesis.

Another distinction that is common in the literature is the focus on only pre or post-M&A phases (with the actual closure of the deal in neutral middle). In the discussion related to Figure 1.2 above it was depicted how IS integration issues are prevalent during all phases of the M&A process and that it would not be fruitful to focus only one phase as the actions since different phases have significant effect on the outcome of actions in other parts of the process.

The subject of integration is often divided into the two categories of inter- and intra-organizational integration. Inter-organizational integration refers to the creation of linkage to external organizational entities and is not covered in this thesis. In line with the purpose of this thesis, only intra-organizational integration is addressed.

1.5.3 Methodological considerations when studying the relationship between IS integration and M&A

The two-fold purpose of this study is concerned with the relationship between IS integration and M&A, and the management of the matter. It was put forward that the study's major knowledge contribution is in the explanatory theory of the relation and prescriptive theory for its management. The word 'explanatory' should, however, be used carefully as in the literature on research methods it is often used to refer to studies based on a clear hypothesis that is tested (e.g. Dubé & Paré, 2003; Yin, 1994). In the terminology of Yin (1994), the purpose of this current study leans more towards a descriptive nature. Claiming that this study is of explanatory nature refers to a more commonsense meaning, used by, for example, Mohr (1982). The current status of the research field does not permit construction of a theory of interest, predictions from the theory, and rival theories as defining explanatory

research (Dubé and Paré, 2003). The field's most outstanding characteristics are the fragmentation and immaturity that still prevail.

Above it was argued that not only the initial setup of IS and M&A, but also the related integration processes should be taken into account in IS integration in M&A. When accepting M&A integration as an organizational change process and IS integration in M&A as being part of the M&A integration process, the question remains how to describe and explain organizational change processes. The literature review describes two kinds of theoretical contributions that were found relevant for approaching IS integration in M&A: content based and process based models. According to Mohr (1982), description and explanation of organizational change is most appropriately done with process theory. Models based on process theory and process models capture a patterned sequence of events generated by an organization (Dooley & Van de Ven, 1999). Through the discovery of such a mechanism, it becomes possible to postulate how changes in specific organizational variables might affect the dynamics of an organization (Dooley & Van de Ven, 1999). To understand the decisive aspect of the processes and also build theory that can be valuable in further research, one must focus on events and the underlying mechanisms that connect the events with each other, not only the consisting factors that are isolated in before and after snapshots. Mohr (1982) argues that theories and models of organizational change and developments that focus only on factors and the relation to each other will never be stable. It will not be possible to establish lasting relationships between contributing factors and integration outcome; for that the organizational development process is too complex.

Existing research, as presented in chapter 2 to 4, says very little about the IS integration process or how it might be studied. Models provided by McKiernan and Merali (1995) and Giacomazzi et al. (1996) apply a process perspective, and do not address the methodological question of how they identified major processes. Stylianou et al (1997) and Robbins and Stylianou (1999) provide frameworks for examining IS integration in M&A, but only to create what Mohr (1982) calls variance models – models that do not recognize the process as a contributing factor to successful IS integration. Consequently, a framework for describing and explaining not only the content based aspects of M&A, but also the organizational change processes related to IS integration needs to be created as one part of this

research project. For the purpose of describing the nature of this study and which types of knowledge this study strives for, a stand is taken of a combination of process and content based theory being the way to grasp the IS integration process in M&A. This will be further used as basis for selection and design of empirical collection approaches.

The second part of the contribution is practical knowledge that should help to solve a problem encountered by IS professionals. Prescriptive theory is the desired outcome of design science research (Gregor, 2006). Design science has recently achieved considerable attention and has been suggested as a means of overcoming a serious relevancy problem in IS research (Carlsson, 2006). In contrast to the behavioral science paradigm of IS research for which output is primarily theory for analyzing, describing, and explaining phenomena targeted to the academic community, design science research has the professionals of the IS field as the primary target group (Carlsson, 2006). In the case of this research project, the target group is managers with IS integration in M&A. IS professionals can be expected to have received training or education to do their job. Thus, the output of design science research is not step-by-step instruction or a seven point manual, but rather general knowledge that can be applied to a specific problem (Carlsson, 2006).

This study combines two different research paradigms that at first glance may seem to embark on routes to diverging ends. However, the ends may also be seen as different sides of the same coin. The prescriptive theory produced in design science research is not an exception to the descriptive and explanatory theory covering the phenomena (Iivari, 2007). Developing descriptive and explanatory theory to use as foundation for prescriptive theory can be regarded as a part of the design research process (see Chapter 10). The theoretical chapters (Chapters 2-4) are relevant since the study leads to managerial support. The managerial focus, of primary interest here, implicitly determines that it is the issues of IS and M&A that can be managed. It is thus these managerial issues that are in focus in the theoretical chapters. It would be possible to argue that all research in this thesis is design oriented research. However, since the major contribution is of descriptive and explanatory character, labeling all research activities as design research would give the wrong impression of what has actually been done.

The study's two imperatives could be pursued in isolation, but there are obvious advantages to a combined approach. To design a

useful proposition of how IS integration can be managed, the researcher needs to understand (be able to describe and explain) practice. In designing propositions that support practice the researcher gains a deeper understanding of the reality he or she is trying to support (Mathiassen, 2002). For the sake of readability, research activities are in this thesis held separate, but it is noteworthy that the reality was a highly intertwined research process: the purpose of fulfilling the two purposes to a high degree depended on the progress of one another.

1.6 The empirical cases

The empirical data in this thesis comes from four M&As which were constituent parts of Trelleborg AB's growth strategy. Trelleborg AB is a global industry group with some 22,000 employees in about 40 countries. The head office is still located in the small town of Trelleborg, in the very south of Sweden. Annual sales are of approximately $3 billion. The company, which celebrated its 100th anniversary in 2005 has through the years developed from a local tire manufacturer to a multinational corporation based on processed polymer materials: "Trelleborg seals, damps and protects in demanding industrial environments throughout the world. We offer our customers engineered solutions based on leading polymer technology and unique applications know-how" (Trelleborg, 2006, p. 9).

During the latter part of the 1990's, the corporation was restructured and a new corporate strategy was developed. The strategy adopted was termed 'concentration and expansion.' Divestment of operations considered non-core created a strong financial position. Expansion meant that the Group would utilize substantial amounts of its financial resources for external growth. The target for average growth in sales is 8–10 per cent annually over an economic cycle. Growth is achieved through a combination of organic growth and ongoing M&As to expand operations. During the last decade, Trelleborg has been involved in more than 50 M&As and intends to continue its strategy with a pace of 5-10 M&As yearly.

Trelleborg has, like many other companies, learnt that growth through M&A is difficult and risky. Not only because of difficulties predicting which synergetic effects could logically be possible when joining two organizational units, but also since potential synergies have

proven to be difficult to leverage in reality. As a part of the synergetic potential, Trelleborg has experienced that IS integration plays a significant role. The organizational integration cannot be effectuated without successfully integrating the units IS.

In this thesis, the empirical data comes from four M&As which were purchased by Trelleborg:

- CMP/Kléber, French hose manufacturer with sales of € 60 M and 750 employees.
- Dynaflex, specialty-hose manufacturer with sales of € 15 M and 50 employees.
- Chase-Walton Elastomers, manufacturer of silicone components with unit sales of € 10 M and 110 employees.
- CRP Group, manufacturer of offshore equipment with sales of € 100 M and 500 employees.

The four units were to a different extent integrated with existing operations of Trelleborg AB to leverage synergetic effects originating from the M&A. To enable the organizational integration, the previously independent units also had to become integrated in their IS. The four cases depict fundamentally different approaches to actually making this integration happen.

1.7 Disposition and use of publications

Figure 1.3 presents the structure of this thesis that is divided into four parts. Part I consists of the first four chapters and covers the outset of the thesis. The aim of chapter is to frame the study, highlighting its relevance and context. The introduction and the derived purpose is, to some extent, based on a few previously published articles (Henningsson, 2005c; Henningsson, 2006b; Henningsson, 2006a). Chapters 2-4 are devoted to the theoretical foundation of the study and are divided into research into: IS integration, research on M&As, and research on IS integration in M&A. These chapters are extended and summarized versions of theoretical reviews that can be found in Carlsson and Henningsson (2007), Henningsson (2005c; 2005b; 2006b; 2007; 2005a), and Henningsson, Svensson, & Wallén (2007).

Part II (chapters 5 - 9) covers four theoretically grounded case-studies that seek to describe and explain IS integration in four M&As at Trelleborg AB. Chapter 5 addresses the methodological consideration for these research activities. The research activities of are based upon a preliminary theoretical framework integrated from existing theory on management of IS integration in M&A and presented in Chapter 6. In Chapter 7 Trelleborg AB and the four investigated cases are reported. Based on the empirical material, Chapter 8 addresses the relationship of IS integration in M&A. Chapter 9 evaluates the preliminary theoretical framework, and implements changes based on the evaluation. The empirical findings are also used to develop an initial model of IS integration in M&A. Previous versions of the theoretical framework and initial accounts for the empirical data have been published in Carlsson & Henningsson (2007), Henningsson (2005b), and Henningsson & Carlsson (2006b; 2007).

Part III incorporates the design research activities to support managerial needs. Chapter 10 discusses the development of practical knowledge to supports IS professionals. The method that makes use of the IS design science approach is an extended and summarized version of the method published in Carlsson et al. (2008). Chapter 11 addresses three managerial challenges related to IS integration in M&A with supporting knowledge based on scientific research.

Part IV (Chapter 12) sums up findings, discusses limitations and problems encountered during the study, and proposes future research needs.

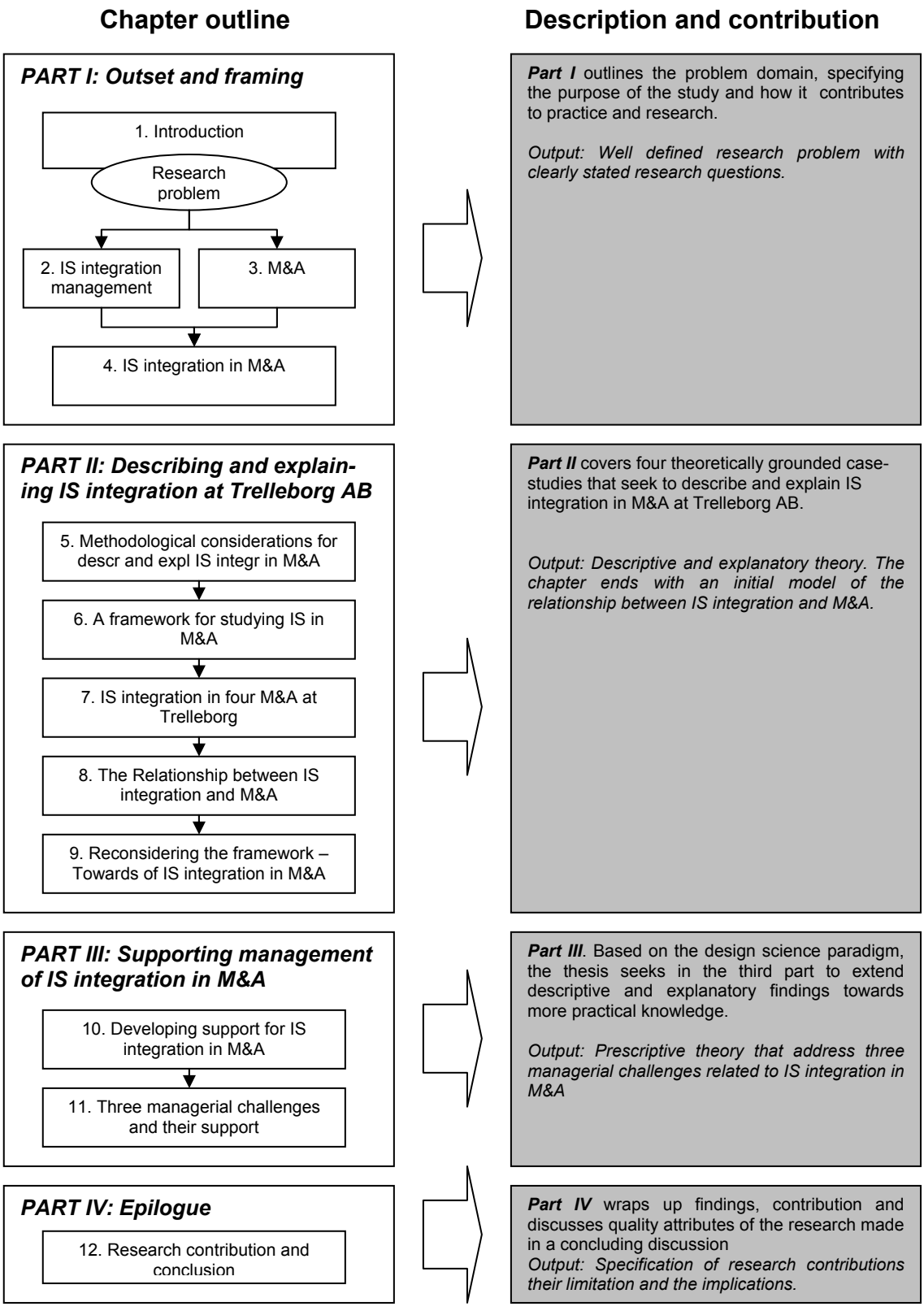


Figure 1.3 Disposition of the document at hand

2. Management of information systems integration

This second chapter is devoted to prior research on IS integration management. The aim of the chapter is to outline the study's theoretical foundation and, in doing so, straighten out the domain's tangled vocabulary and position the study with respect to prior works on IS integration. The literature review is centered around the situation of the IS manager and the managerial tasks related to IS integration. This is in contrast to the specific theoretical direction from Pawson (2006) and Tranfield et al. (2003) on how to have literature reviews focus on a real world situation in order to enhance a situation.

As the terminology concerning the topic is rather confused and studded with ambiguous terms, any serious attempt to discuss the subject matter needs to be of a defining nature. Hence, the chapter starts with a defining discussion on the three terms "information," "system," and "integration." The chapter then continues with identifying the elements of IS integration management. It is contended that IS integration management can be refined into the tasks of a) selecting among the basic structural options for IS integration and b) relating them to the business of the organization. Consequently, the chapter continues with addressing the objectives of IS integration including its relation to organizational integration and potential benefits of integrated IS. Then the basic structural options of IS integration that should be orchestrated to match organizational goals are presented. The chapter ends with a summary of how the study is positioned in relation to the presented literature and which theoretical contributions are useful for applying to the construction of a framework for IS integration in M&A.

2.1 The terminology of IS integration

IS integration, Enterprise Integration (EI), Enterprise Systems Integration, Enterprise Application Integration (EAI), ERP Integration,

Service Oriented Architecture (SOA), Electronic Service Bus (ESB) etc. This list of terms in the literature that refers to some kind of IS or IT related integration can be extended almost infinitely. A flora of terms that often have multiple purports makes the IS integration vocabulary just as extensive as confusing. An attempt is made here to clarify how the notions are being used in the literature so as to make possible further presentation of research in the domain. A direct consequence of the interchangeability in terminology is that in order to incorporate prior research findings in a review like this, one has to consider what the theories, models and conclusions actually say. Not even research contributions under the same label, e.g., EAI, can by default be assumed to refer to the same object of study, as almost every author defines the object of study individually.

2.1.1 Information and systems

Many terms in the IS integration literature have ambiguous meanings and 'IS' itself is not an exception. The term 'information system' consists of two parts: 'information' and 'system.' Information is based on data which, in turn, is a formalized representation of the world (Langefors, 1993). Data becomes information when it is interpreted by humans based on their preunderstanding (Checkland & Holwell, 1988). Thus, whatever definition of IS is used, it should include the human component, as the interpretation has a central position in information creation and transfer processes.

'System' embodies the idea of a set of elements connected together which form one entity, thus showing properties which are properties of the whole, rather than properties of its component parts (Checkland & Scholes, 1990). A system might be defined as a coherent set of interdependent components that exist for some purpose, has some stability, and can be usefully viewed as a whole (ibid).

2.1.2 Definitions of information system

When it comes to the combined term 'information system,' the term has at least three different meanings in the literature: first, it refers to a concept related to a product, a system related to information formation. Second, it refers to an academic field of study, and third, to an industrial practice (Beynon-Davies, 2002, p. xxiii). Central in this

thesis is the first meaning of the concept of a system for information extraction and refinement; however, in the internal discourse of the academic field what is defining the domain of IS research is essentially a discourse on the definition of IS.

Whether IS research is one single field of study, and whether IS may be regarded as a homogeneous phenomenon has been disputed by researchers and theorists with interest in the subject matter. There is no lack of suggestions on potential cores bonding the field together, but little consolidation has taken place (Alter, 1999). With Benbasat and Zmud (2003) arguing in a recent MIS Quarterly article that IS research should focus on the IT artifact and its immediate nomological net, it was the take-off for the latest major debate on what was good IS research and what should be the unit of analysis in order to advance the research field. The article resulted in 12 responses published in the Communication of the AIS (volume 12, article 30-41) and one editorial comment. Benbasat and Zmud (2003) can be said to represent a view of IS as a purely technical system.

Major criticism was led by Alter (2003a; Alter, 2003b), who argued that although the IT artifact was an important component of IS research, IS were best regarded as organizational work systems supporting other organizational work systems. It was in the support of the IS work system that it found its value, thus it is from this perspective that it should be studied (Alter, 2003a). Alter's term 'work system' refers to "a system in which human participants and/or machines perform a business process using information, technology, and other resources to produce products (and/or services) for internal or external customers" (Alter, 1999). As IS are work systems, Alter (Alter, 2003a) argues that a general framework for assessing work systems (Figure 2.1) may be applied to IS as well. "The work system framework defines the eight elements that should be included in even a superficial understanding of a work system" (Alter, 1991, p. 15). IS, according to Alter (1999), process information by capturing, transmitting, storing, retrieving, manipulating, and displaying information. Like most work system, many IS can be subdivided into a set of smaller systems. The choice of how to define the borders of an information system under consideration depends on the problem studied. For example, administrative personnel processing information in a routinized and predictable way may be considered taking part of the IS, but Alter's opinion is that a manager who uses information

provided by MIS would be outside the IS and would take part of another work system related to management.

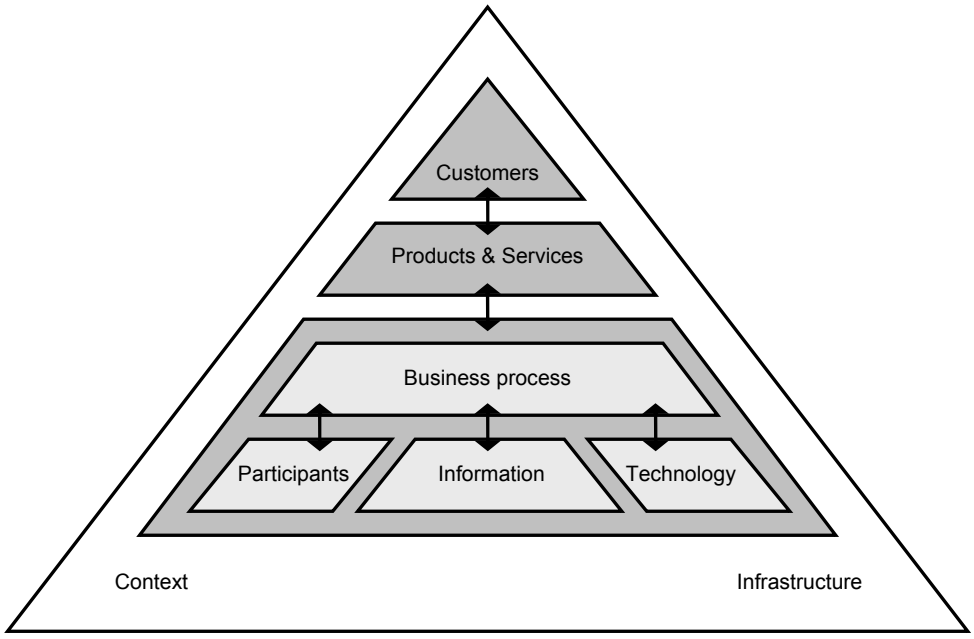


Figure 2.1 The work system framework. Redrawn from Alter (1991, p. 15)

Another view of IS is that of IS being something more than just a technical system. In a discussion on what IS research is actually about, Weber (2003) concludes that "…the core [of IS], if one exists, will not lie in theories that account for information technology-related phenomena. Rather, it will lie in theories that account for information systems-related phenomena. The two sets of phenomena are not the same. They are fundamentally different" (p. vi). This view was supported by Iivari (2003), claiming that "IS researchers do not do IT research; IS researchers do 'IS research.' The two are fundamentally different" (p. 583). This view includes the IT system as a normally important part of the IS, but that is not to say that IT systems and IS are the same thing (Myers, 2003). It is even possible to imagine an IS without IT, only consisting on manual information processes (c.f. Langefors, 1978). One argument for adopting this view is basically that, from an organizational perspective, an IT system has no value on its own (Hedman & Kalling, 2003). The value is determined by its ability to provide the organization with relevant information, and thus the focus on information process rather than information technology. Alter (1999) did highlight this circumstance in his work system

argumentation. However, what Alter calls information, Checkland and Holwell (1988) call data. Therefore, his definition of IS becomes one of a purely mechanical and static system.

Summarizing the discussion above, the discourse touches upon three distinct levels of IS: a) organizational, b) infological/conceptual, and c) technological (Iivari, 2003). On an organizational level, the context is the users and their activities (Lyytinen, 1987). It has been put forward that one implication of regarding the IS as a system that serves organizational processes is that all IS are context specific. IS cannot be bought. Only hardware and software used in the implementation of IS can be bought. The IS are specific to the organizational context in which they are implemented (Iivari, 2003).

The infological/conceptual level of analysis refers to the internal characteristics of the system as a system for information processing. This should be regarded in the light of the arguments directing IS research towards an IT-artifact, that do not conform to system properties. The relation between IS and IT is intriguing and fuzzy. Nevertheless, it is essential to be established in defining the study's focal object. By definition, at least not in all definitions at hand, IS do not have to include advanced IT. A technological level of various computer-related IT components does not have to exist. The theater may be regarded as an IS. Also, in commercial organizations non-technical IS exist, for example, marketing could be seen as such. In this study, however, the IT plays a significant role. And, it does so in the lion's share of studies that consider themselves as having IS as focal object. Thus, although *theoretically* speaking IS do not have to include IT, based on the *practical* use of the term, IS in this thesis refers to IS that function with the support of IT.

2.1.3 A working definition of IS

For an appropriate working definition of IS, it is necessary to delineate what this study entails. The discussion on purpose and research questions in chapter 1 describes IS integration as a means to leverage potential synergies and as being closely related to organizational integration. Accordingly, the focal object should include not only the processes within the system, but also the system's functionality. This is necessary to capture the very essence of the system's existence and also why it is being integrated.

From the discussion above, we also learned that inclusion of the human component is necessary for the very same reasons. As a human is the creator of information in the interpretation of data, IS without a human interpreter are data systems, not IS. Therefore, IS are social systems.

Further, the notion of 'system' implies that IS as whole have different properties than their constituting components. It was argued earlier that IS are not only systems of IT. However, the actual use of the term IS includes a reference to IT, making IS also technical systems, although not logically demanded, based on the heritage of the constituent terms. In conclusion, a working definition of IS should meet five criteria:

1. Include a human interpreter
2. Refer to an object which has system properties
3. Acknowledge the purpose/functionality of the system
4. Depict the processes the system carries out
5. Be supported by IT

In this study, the working definition of IS is provided by Iivari (2005) who extends and elaborates upon a definition by Gustafsson et al. (1982). Iivari (2005, p. 18): "In my vocabulary, information systems form a subcategory of IT artefacts. I interpret an information system as being a system whose purpose 'is to supply its groups of users (…) with information about a set of topics to support their activities'." As mentioned earlier, Iivari considers the IS being present at three levels: organizational, infological, and technological. These three levels include users and their activities, information about a set of topics, and the information technology. Iivari's interpretation thus covers all five conditions above. Drawing on Iivari (2005) and Gustafsson et al. (1982), this thesis regards an information system as:

> an IT-based system whose purpose is to supply its groups of users with information about a set of topics to support their activities.

This is the working definition of IS that to a large extent determines the boundaries of this study. However, the definition is broad and includes a range of different applications in a modern organization, from e-mail based IS to organizational systems supporting the business processes of

a whole company. Approaching IS in an M&A context, it must be held likely that all different types of IS relate similarly to the M&A. There is a need for a differentiated view that acknowledges the diversity of IS.

2.1.4 A differentiated view of IS

Although the section above just provided a working definition of IS, it is argued here that the concept can beneficially be refined into subcategories for analyzing its relation to business. The set of subcategories will be referred to as the 'IS ecology.' The ecology of IS may be organized in a number of ways. The flourishing list of terms (e.g. enterprise resource planning [ERP] systems, customer relationship management [CRM] systems, decision support systems [DSS], and so on) that refer to different kinds of IS is one way to distinguish between different classes of systems. However, a taxonomy of vehicles that consist of the groups: 'bikes, blue trucks and Mercedes' is not a good taxonomy since the classes neither cover the complete population nor are they mutually exclusive. In the same manner, classification into ERP systems, Enterprise Systems (ES), DSS etc., would not serve the purpose of organizing the flora of IS into categories with different characteristics influencing the integration work and the M&A process in different ways. Instead of focusing on the technology involved in the system, it is argued here, based on Weill and Broadbent (1998), that a differentiation based on the components' function is more appropriate when it is not the technology itself, but its possibility to contribute to the business of the organization (in this case to complete the integration), that should encompass the foundation of an IS typology. Weill and Broadbent (1998) divide IS into Infrastructure, Transaction, Informational, and Strategic IS according to Figure 2.2.

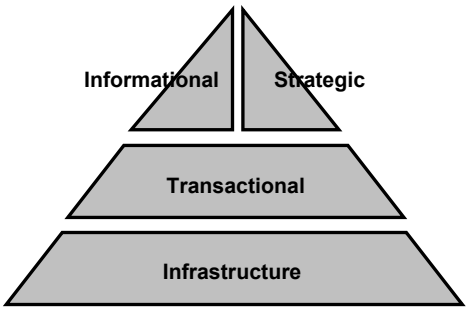


Figure 2.2. Four categories of IS (Weill & Broadbent, 1998).

Infrastructure IS comprise the basis for a company's operations. The word infrastructure is used in a number of contexts; here it refers to technology and expertise that make possible the information flows within the company. Wiell and Broadbent describe a "infrastructure capability" that includes "firmwide communication network service, provision and management of large scale computing, the management of shared customer databases, firmwide intranet capability, and research and development expertise aimed at applying emerging technologies to the business" (Weill & Broadbent, 1998 p. 26). The purpose of the Infrastructure IS is to function as a service towards other types of IS which, in turn, fulfill organizational needs. Organizations invest in Infrastructural IS to achieve business flexibility and agility, reduce their marginal costs of IS, reduce costs over time, and develop standardization. In the retail, manufacturing and finance industries, business invest about half of their IS budget in Infrastructural IS (Weill & Broadbent, 1998).

Transactional IS work primarily on an operational level of business, processing and automating the basic, repetitive transactions of the company. This includes such activities as stock monitoring, production planning, order processing, and bookkeeping. The basic condition for the existence of Transaction IS is reduced cost, and this is done by increasing transaction speed, reliability or use of resources (Weill & Broadbent, 1998). Transaction IS require reliable Infrastructure IS to function, which means that integration of Transaction IS also implies integration in Infrastructure IS. Retail, manufacturing and finance business all invest about 15% of their IS budget in Transactional IS to achieve benefits of cutting costs in daily operations and increased throughput in the supply chain (Weill & Broadbent, 1998).

Informational IS work on the basis of Transactional IS, providing the means for managing and controlling the company (Weill & Broadbent, 1998). The heavy investments in Transactional IS have set the ground for extracting data from the operations of the company on a regular basis (Kallinikos, 2001). Integrated Transactional IS are preferable in order to achieve Informational IS, but not required per se in the same way that Transactional IS are dependent on Infrastructural IS. As depicted later in this chapter, some integration approaches work by extracting data from several source systems, and with these techniques the Transactional IS do not have to be integrated.

Investments in Informational IS correspond to about 1/4 of the IS budget in the manufacturing industry, 1/5 in finance, but less than 10% in retail. Investment reasons include increased control, more accurate information, and improved quality of the organizations' output.

Wiell and Broadbent (1998) add a fourth class of IS with strategically important implications. These IS are explicitly made to gain a competitive advantage towards other actors in a market. As argued above, the technology itself does not play a significant role in generating competitive advantage, rather it is in the implementation and use that the competitive advantage is found. The average time for the technology itself to create competitive advantage is about 2 years (Weill & Broadbent, 1998). After two years competitors are able to create or purchase similar IT systems. According to Wiell (1998) and Broadbent, more than half of the initiatives to develop and implement Strategic IS fail, with failure referring to projects not being able to deliver net profit value five years after initiation. Nevertheless, finance, manufacturing, and retail all invest about 15-20% of their IS budget into Strategic IS.

2.2 Elements of IS integration management

With the vocabulary of IS integration in place, it is possible to approach the aspects of managerial concerns of IS in general and IS integration in particular. IS integration management can be seen as a subtask of IS management, and since hardly any research directly addresses IS integration management, it is a necessary starting point to first investigate IS management in order to elaborate upon the concept of IS integration management.

2.2.1 IS management

The business value of IS has been disputed for many years (Hitt et al., 1993). Some argue that the availability of hardware and software on an open market make impossible long term advantages towards competitors through IT or IS (e.g. Carr, 2003). In response, it might be contended that every instantiation of IS is unique to its organizational context, and although hardware and software might be obtained from

the market, competitive advantage may lie in the specific implementation and use of that technology (Hedman & Kalling, 2003). The distinction between the IT artifact and how it is managed and used has been emphasized in the concept of IS capability. Capabilities represent a firm's capacity to deploy resources using organizational processes to arrive at a desired outcome. They are developed by combining physical, human and technological resources (Amit & Schoemaker, 1993). IT capability was defined by Ross et al. (1996, p. 31) as "the ability to control IT-related costs, deliver systems when needed and effect business objectives through IT implementations." The authors argue that highly competent IT staff, a strong partnering relationship between business and IT management, and a reusable technology base are the three key IT assets that bring IT capabilities. In turn, IT capability will enhance an organization's competitiveness. With the focus on IS rather than IT, an analogy is possible to be made in order to depict IS capability. The way Ross et al. (1991) use IT, it suggests that IT can only contribute to organizational performance if it is used properly by the organization's members and thus gains its value through contribution to the objective of the organization. Hence, although the authors use the IT artifact as focal point for their analysis, the argumentation is also valid for the IS as defined in this text.

Bharadwaj (2000) extends the traditional notion of organizational capabilities to an organization's IT function, and defines IT capability as the ability to mobilize and deploy IT-based resources in combination or co-presence with other resources and capabilities. The IT-based resources are: IT infrastructure, human IT resources (comprising technical and managerial IT skills), and intangible IT-enabled resources (such as knowledge assets, customer orientation and synergy- the sharing of resources and capabilities across organizational divisions). Peppard and Ward (2004) mention three interrelated attributes of IT capabilities: a fusion of business knowledge with IT knowledge, a flexible and reusable IT platform, and an effective use process (itself with two aspects: using the technology and working with information).

Based on the here applied view of IS as getting its value from how it supports the business of the organization, it can be conclused that the objective of IS management is to contribute to the organization reaching its goals. In other words, that is the IS' raison d´être, and it is the managerial task to make sure this is the outcome. IS management is

thus about making decisions and taking action that leads IS issues in a certain direction. To be able to make decisions on direction, it must be known which alternatives are available and which decisions have to be made. IS management can thus be divided into two parts: 1) knowledge of alternatives and basic structural choices of IS and 2) how the choices affect the organization.

The field of IS governance (and IT governance) is closely related to IS management, even though some authors choose to make a distinction:

> IT governance represents the framework for decision rights and accountabilities to encourage desirable behavior in the use of IT. […] IT governance is not about what specific decisions are made. That is management. Rather, governance is about systematically determining who makes each type of decision (a decision right), who has input to a decision (an input right) and how these people (or groups) are held accountable for their role. Good IT governance draws on corporate governance principles to manage and use IT to achieve corporate performance goals. (Weill, 2004, p. 3)

According to Brown and Grant (2005), IS governance was initially introduced to the research community when Brown (1997) and Sambamurthy and Zmud (2000) began to refer to the notion of "IS governance frameworks" and then later to "IT governance frameworks." However, what is described above as IT governance has long been discussed in the literature under different labels. IS governance can be seen as an attempt to collect works on: control of information services (Olson & Chervany, 1980), IS organizational structure (von Simons, 1995), IT standards (Kayworth & Sambamurthy, 2000), IT decision making responsibilities (Boynton et al., 1992), IT management architecture and locus of IT decision making (Boynton et al., 1992), IS organizational role, and location of IS responsibility (Brown & Magill, 1994) under one unifying label. The existing research on IS governance can roughly be divided into two streams. The first focus is on IS governance forms and the second on contingency factors for IS governance (Brown & Grant, 2005). More precisely, the first strand focuses on the basic structural options that exist for creating and developing organizational IS. The second stream acknowledges that there is not just one, universal best way of arranging

the available options, but the choices of appropriateness are instead dependent on a number of contingency factors.

So, why is IS governance introduced here when according to the definition above it is clearly separated from IS management? First, not all authors make such a clear cut distinction. For example, in introducing the IT governance track for Hawaiian International Conference on System Sciences in 2005, Van Grembergen defined IT governance as "the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensuring the fusion of business and IT" (Van Grembergen, 2005, p. 1). This definition approaches IS management as defined in this text as it talks about what management has to do to relate IT decisions to organizational goals, and also how to implement the IT strategy. Further, when discussing IS management in terms of how to manage or govern IS to a desired outcome, the very typical questions of IS governance, such as division of labor, responsibility and organization of the task, are tightly intertwined with the actual tasks carried out. Compared to the managerial discussion as being part of the IS capability domain, the similarity is striking. The task of IS management could (as explained earlier) be refined into understanding the options available for developing the organizational IS, and how the different alternatives relate to business objectives. One conclusion is thus that IS management and IS governance are two closely linked concepts. This is, however, not the most important conclusion here. More important is that both traditions have arrived at the same understanding that the role of IS management is to:

a) identify the different basic structural choices that exist for developing the organizational IS, and
b) make decisions upon an understanding of how the alternatives relate to organizational objectives.

IS management can be addressed on a general level in an attempt to relate IS strategies to organizational strategy. This task is commonly referred to as IS alignment. Research on IS alignment seeks to develop common models and frameworks that cover different organizational objectives, and then tries to link them to IS alternatives (e.g. Hirschheim & Sabherwal, 2001; Silva et al., 2007; Chan Yolande et al.,

2006). Alignment of IS and business has also been focused on achieving specific organizational benefits, such as increased quality (Hilgers et al., 2004) and organizational transformation (Henderson & Venkatraman, 1992; Hilgers et al., 2004). As explained earlier, the borders between what to call management, governance and strategy are not clear-cut. If some distinction should be made, it is between formulation and implementation of plans, with formulation relating to strategy, and the implementation to management. But naturally, when discussing management there is always the need to understand the goals towards which IS should be managed. Weill and Broadbent (1998) argue that it is the role of the IS manager to adapt and direct the IS choices toward the organizational goals. There is no one single best way for IS management, but the appropriateness of IS choices are dependent on the choices of mutual arrangement and the arrangement to the organizational context (Weill & Broadbent, 1998).

The discourse of IS management touches upon several different conceptual levels and the task of management is to relate choices in each level to each other. It is foremost two levels that are prevalent: the infological (IS) and organizational. When discussing organizational goals the strategic level is also a concern. Strategy is yet another concept that can include everything from a plan on how to get somewhere to an abstract vision of the future. In this thesis a company strategy is treated as the organizational goal that helps managers in an orderly way to transform the daily choices that improve the organizational performance (c.f. Porter, 1980). One of these subtasks that includes both the element of identifying alternatives and understanding how they relate to the organizational objectives is IS integration management.

2.2.2 Integration issues

IS integration management can be seen as a subtask of IS management that is specifically related to integration of various IS. Not much is written about IS integration management, but the task is similar to what was concluded above about IS management in general.

To understand the managerial issues of IS integration, parallels can be drawn from the IS governance research. The two streams of research focusing on the basic, structural options and the contingency factors determine which options are appropriate during specific settings. Along

with the discussion of appropriateness of the options is the discussion of IS objectives, that is, to deem what is "appropriate" IS. With the view of IS as a resource that can be used by other resources in achieving competitive advantage, which is in line with the IS definition applied in this text, the appropriateness of IS is to be found in how well the organizational processes are supported. The contingency factors are in this case related to the integration context, that is, the organizational integration. Basic structural options are related to the integration alternatives that exist.

The economic rationality perspective applied in this thesis is in many ways limited, but at least it does have the advantage of having all tasks in the organization contributing to the economic value of the organization. In reality, however, it may be unfeasible to relate IS integration directly to financial figures due to complexity and contextual factors. If the value of IS is deemed by its contribution to organizational objectives to have some other, more traceable effects that are closer to the IS integration but can still be argued as contributing to organizational performance, it can be used to measure the contribution of IS. A parallel can be drawn to IS integration. Just as IS do not have any value on their own, IS integration doesn't make anyone happy either. IS integration is resource demanding and too much integration is a waste of resources (Markus, 2000). If IS integration per se is not worth striving for and the impact on financial figures is difficult to isolate, then there remains the alternative of relating IS integration objectives of how the organization wants to design its business. IS integration can be regarded as contributing to organizational integration (Alsene, 1999).

The objective of IS integration management to direct IS integration in a way that it contributes to organizational integration has a logical parallel in IS management and its objective of contributing to the business of an organization. Similarly, structural options of IS management have parallels in IS integration management. The managerial task of choosing among alternatives of how to form the organizational IS is paralleled by the choosing among alternatives for IS integration. It lays within the managerial scope to understand which alternatives exist and how they affect the organization, and in the case of IS integration, it relates to the organizational integration. The question remains as to which alternatives need to be considered for IS integration.

IS integration is sparsely conceptualized in the existing literature. Existing contributions have mainly been made in two streams: one focusing on the layer structure of IS, and the other on the possibility of linking one IS to another on a certain level. These options will be further elaborated upon in section 2.4. In the next section the second element of IS integration management, the IS integration objectives, will be addressed in more detail.

2.3 IS integration objectives

This section attempts to link IS integration to the reasons behind the initiative. IS integration can be seen as an investment that consumes resources and should in the end be justified with organizational benefits that at least match the resources required.

When talking about IS integration it is normally thought of in the context of modern, global corporations doing real-time business with their partners, but the idea of integrating IS is not new. Along with the development of systems engineering during the 1940s to 1960s there evolved the discipline of systems integration and the thought of connecting computer based systems as a means to coordinate and control complex aerospace and computing systems (Johnson, 2003). Through the years, the word integration has been used in a multitude of settings and has evolved in meaning along with the needs it is supposed to fulfill. This part of chapter 2 provides clarity as to why organizations engage in integration activities, as well as which needs such investments in time and other resources are supposed to fulfill. Integration is yet another word that has to be given additional distinction before being used extensively.

2.3.1 Integration on several levels

"Surprisingly, very little literature directly defines integration" (Schweiger & Goulet, 2000 p. 63). The notion of integration has been used and interpreted in various ways across several disciplines related to M&A, including management, strategy, organization theory, production/operations management, and IS (Barki & Pinsonneault, 2005). It has, perhaps a little ironically, evolved in a fairly isolated and non-integrated manner. Barki and Pinsonneault (2005) surveyed how

the term had been used in organization-related sciences and found that it was first conceptualized within the strategic domain by Fayol in 1949 related to cooperation and coordination. Later Lawrence and Lorsch defined integration as "the process of achieving unity of effort among the various subsystems in the accomplishment of the organization's tasks" (1969, p. 34). Although several different definitions flourish in the literature, some consensus exists within the strategy literature in that the concept of integration describes coordination of activities or management of dependencies between the activities (Glouberman & Mintzberg, 2001).

The use of integration in other domains is related to the use within the strategic field. Integration is seen as the coordination of information, material flows, plant operations, and logistics in the literature on production, operations, and logistics (Chandra & Kumar, 2001). The literature on innovation relates integration to how much the different activities of the innovation process are dependent and how well they are coordinated (Ettlie & Reza, 1992).

Although the specific use differs from field to field, the founding thought of the integration concept commonly relates to individual and distinct components that form a unified whole. For a business organization, the concept of Organizational Integration (OI) has been developed to encapsulate the way in which this unification of organizational units, departments, partner business processes, people, and technology are involved (Barki & Pinsonneault, 2005). "OI essentially represents a structural and relational characteristic of a given organization or between organizations." (Barki & Pinsonneault, 2005, p 166) Other concepts address the subject matter in slightly different words. Integration of the enterprise is defined as "action of forming an ensable, a coherent whole, of the various administrative units that make up the enterprise, each of which assumes certain functions" (Alsene, 1999, p. 27) Related terms also include, for example, Organizational Alignment, the "degree to which an organization's design, strategy, and culture are cooperating to achieve the same desired goals" (Semler, 1997, p. 23), and Strategic Alignment or Strategic Fit which are concepts based on the same logic of orchestrating distinct components (e.g Porter 1996, Peters & Waterman 1982, Miller, 1986). Strategic fit is contended to be of outmost importance to contemporary business organizations (Porter, 1996, p. 73):

> Strategic fit among many activities is fundamental not only to competitive advantage but also to the sustainability of that advantage. It is harder for a rival to match an array of interlocked activities than it is merely to imitate a particular sales-force approach, match a process technology, or replicate a set of product features.

The fundamental thought behind the various definitions of integration presented above is the distinctiveness of its constituting components and the idea of a unified whole (c.f. Orton & Weick, 1990). The distinctiveness of components is important, as homogenizing and synthesizing components may at a first glance seem as the ultimate integration, but, in fact, eliminates the differentiated and complementary skills and expertise that come with specialization. The objective of integration should thus be to enable specialization, but, at the same time, make sure that the different units adapt and respond to each other (Barki & Pinsonneault, 2005). The efficiency of integration depends on how effectively organizational members can receive and interpret information sent by other members or from the organizational environment (Grant, 1996a) In other words, the distinct IS of the constituting units must to some extent be integrated. The need for IS integration emerges as soon as an organization is divided into discrete units (Alsene, 1999). IS integration roughly denotes the creation of linkage between two previously separated IS (Markus, 2000). This is fairly uncontroversial, a loose conception for which there should be a general consensus. However, on the concept of IS integration, much more is to be said. The concept has in the field of IS been studied from at least two principal perspectives (Barki & Pinsonneault, 2005).

In the context of IS integration, integration has been used to describe the connectedness of an organization's IT components and the degree to which the different components share a standardized conceptual schema (Chiang et al., 2000). The integration in this view refers to the extent to which different IT systems within an organization are able to transfer data from one system to another. A second perspective in IS integration regards integration as the extent to which the business processes of two or more independent organizations are standardized and coupled through IT (Zaheer & Venkatraman, 1994).

Terminology confusion within this area is monumental. The first perspective on IS integration may also sometimes be referred to as 'Systems Integration' (Markus, 2000). Systems integration has roots to

System engineering and the end-objective is computer systems that work smoothly. To separate the other perspective from systems integration, various terms have been suggested. EI (Lee et al., 2003; Petrie, 1992), as a part of Enterprise Engineering is one alternative term. This term has, however, been claimed to be misleading as it reduces integration of a company to IT integration as the only means to achieve organizational integration (Alsene, 1999). Yet another alternative is the term Computer Integration of the Enterprise (Alsene, 1999). This stresses that it is more organizational integration than just integration through IT (Alsene, 1999). On the other hand, with the claims above that IS are far from the same as computer systems, computer integration of the enterprise is not equivalent to IS integration in the connotation of achieving organizational integration.

Table 2.1 summarizes the concepts related to IS and IT integration of organizations. The table roughly divides the terms into four abstraction levels. This classification is rather general, since all of the concepts have been used in numerous ways. Therefore, exemplifying references are given that illustrate their use. Wherever clearly distinct use of the terms exists some of the terms are placed in two levels. The table is an attempt to sort out the terminology and restrict confusion. It is the IS integration concept that is vital for the study presented here, but as will be shown later, the theoretical development from the related fields may be used to elaborate the concept of IS integration.

Table 2.1 Categorization of Integration-related concepts

Level of analysis	Proposed concepts (examplifying reference)
Strategic	Strategic fit (Porter, 1996), Strategic alignment (Mehta & Hirschheim, 2007)
Organizational	Organizational Integration (Barki & Pinsonneault, 2005), Organizational Alignment (Powell, 1992), Business Integration (Markus, 2000), Enterprise Integration (Alsene, 1999)
Information System	Information systems integration (Giacomazzi et al., 1997), Enterprise Systems Integration (Davenport, 2005)
IT system	Systems Integration (Mendoza Luis et al., 2006; Markus, 2000), Enterprise Integration (Petrie, 1992; Lee et al., 2003), Enterprise Systems Integration (Marchetti et al., 2001), Computer Integration of the Enterprise (Alsene, 1999), Computer Integrated Manufacturing (CIM) (Alsene, 1999)

IS integration has through the years been used to describe a process, a condition, a system, and an end-state (Gulledge, 2006). It can be compared to the discussion above of increased levels of integration

where integration clearly refers to a state. Integration, on the other hand, to implement the tighter coupling refers to integration as a process. To define an appropriate use of the term in this thesis, it is necessary to return to the stated purpose in chapter 1. The purpose clearly denotes 'integration' in the sense of a process leading up to integrated systems.

The concept of IS integration runs the risk of being diluted and imprecise. It can easily be too far embracing, almost similar to the notion of OI. If IS integration is set to include also standardization and coordination of business processes, it becomes analogous to some definitions of OI. As explained in the discussion on IS versus organization, the delimitations between the two are not always crystal clear. In some cases, it was contended that an organization could be more or less inseparable from IS. This is. of course, problematic when trying to specify borders between IS integration and OI. IS integration in this thesis builds upon the applied definition of IS as presented earlier and the purpose of the thesis work that refers to integration as being a process leading up to an aligned state. IS integration differs from OI in the same way that IS differ from organizations. The objective is to enable specialization in a way that every unit within an organization receives the IS support that it requires, but not to the expense of coordination and mutual adaptation of individual IS components. Barki and Pinsonneault define the IS integration of two idependent organizations as "the extent to which the business processes of two or more independent organizations are standardized and tightly coupled through computers and telecommunications technologies" (Barki & Pinsonneault, 2005, p. 166).

However, formally speaking, this text is not about external integration of two independent organizations but about internal integration. Additionally, they conform to the view of IS being computers and telecommunication technology, that is, the same as this text labels IT. In this thesis the view of IS is different, that is, it replaces IT with IS in accordance to the definition above. Internal IS integration can in a similar fashion be used to promote, advance, and strengthen coordination between subunits (Truman, 2000). A definition of internal IS integration for this thesis is given as:

> The degree to which the business processes of two or more organizational subunits are standardized and tightly coupled through IS.

The difference between integration through IS and IT is essential and will be accounted for in depth in section 2.4.1. The integration can be made on several levels comparable to the levels of an IS as presented above. Integration on the IT level is one option, but integration can also be made on an infological or organizational level (Al Mosawi et al., 2006). With the definition of an IS raison d'être as a contribution to the organization's performance and the related choice of undertaking this study on a mainly organizational level, referring only to IT integration would be in disharmony with the applied perspective.

2.3.2 Potential benefits of integrated IS

The systems integration attempts can be said to have started shortly after the Second World War when American army suppliers tried to connect the different technologies developed during the war with each other, for example, radar with missile systems (Sapolsky, 2003). These early attempts were purely technical in their approach, regarding integration as connecting components and verification of the connectors. The idea of using IT to integrate the various functions of the company emerged in industry and among academics in the beginning of the 1950's (Alsene, 1999). As mentioned above, IS integration can in an organizational context be used to promote, advance, and strengthen coordination between subunits (Truman, 2000). With the material resource planning (MRP) systems during the late 1960's and 1970's, the integration idea gained a solid foothold in the manufacturing industry (Waring & Wainwright, 2000; Cox James & Clark Steven, 1978). MIS was during the 1970's put forward as an approach for integrating the information flows of a whole organization (Gilman, 1977; Kashyap, 1972; Lidd, 1979). The MIS and MRP systems were followed by ideas of computer integrated manufacturing (CIM) and ERP systems, concepts that were accompanied by ideas of tighter integration (Waring & Wainwright, 2000).

In the 1950's and early 1960's between 40 and 60 per cent of space and missile systems failed because of technical reasons, in the 1970's this rate had decreased to between 5 and 10 per cent (Johnson, 2003). But even as the technical dimension of the integration seemed to be under control, at this time the phenomenon of systems integration came to the attention of groups other than technicians. Integration efforts were studied in the light of politics and sociology,

and with the instruments and measurements of social science (Johnson, 2003).

In the late 1990's interest in large scale monolith systems that covered every information need in a global company boomed. Despite risks of rushing costs for proprietary systems or loss of competitive advantage when adjusting the organization to the standardized processes of a publicly available system (Davenport, 2005), companies willingly engaged in what has been called "perhaps the world's largest experimentation in business change" (Davenport, 1995). If the potential obstacles and downsides of enterprise-wide systems are ignored, the potential effects on business summarize the business effects that could be achieved through integration. According to Hedman and Kalling (2003) the "best case-scenario" includes benefits of:

- Business process improvements. The standard packages are developed upon some kind of best practice for business processes which is transferred to the implementing organization.
- Organizational integration. The use of one single IS enables coordination and cooperation between different parts of the organization.
- Data and information access. Using one single system throughout the organization enables instant access to real time data on every process.
- Standardized processes. The inbuilt logic of the installed system forces employees to carry out activities in a standardized manor which hopefully would be the best way of doing an activity.
- Flexibility. Automation of business process can enable product customization and faster swifts in production.
- Productivity. Appropriate IS support enables more efficient production.
- Customer satisfaction. Better control through transparency and standardized quality.
- Supply chain efficiency. Better logistics, fewer items in warehouses.
- Synergy, shared services. Customer service, sales, human resources etc can be centralized to benefit from scale advantages.

- Time to market. Information flows from sales to product development and IS support for product development enables the organization to faster respond to the market.
- Handle growth. As will be explained later in this chapter, inclusion of acquired units into the existing enterprise-wide system is one way of carrying out IS integration.

The list includes several types of benefits that can be traced back to different characteristics of the enterprise-wide system. Which benefits should be included in such as list can always be debated. In this research, for example "integration" is not considered a benefit in itself, but rather synergies, increased productivity, and flexibility can be seen as desirable outcomes of integration. In the literature, the benefits related to large scale monolith systems can be generally grouped into two categories: a) cost savings related to standardization and homogenizations of IS, and b) organizational benefits that are enabled through the integration that follows consolidation into one large scale system (Al-Mashari et al., 2003; Gefen & Ragowsky, 2005; Legare, 2002; Legare Thomas, 2002; Lengnick-Hall Cynthia & Lengnick-Hall Mark, 2006; Stratman Jeff, 2007; Davenport, 2005; Hedman & Kalling, 2003; Kalling, 2003; Corbitt et al., 2006; Gupta, 2000; Lee et al., 2003; Buck-Lew et al., 1992). The consolidation benefits are large scale advantages that come from maintaining and developing one system at one location being less resource demanding than supporting a number of systems in different places. The link to organizational integration is more comprehensive and includes several different mechanisms that lead to organizational benefits. Below is an attempt to give an account of the link.

2.3.3 The link to organizational integration

This thesis has previously argued that IS have no value per se, but the value is determined by how they support the business of the organization. Drawing a parallel to IS integration, to understand the objectives of IS integration management, it must be understand how it contributes to the integration of the organization. Existing research has, in general, found a positive relationship between operationalizations of integration and various measures of organizational performance (Barki

& Pinsonneault, 2005). Explaining why this seem to be so is at the very core of many strategic and organizational theories.

The Resource Based View (RBV) (Barney, 1991) holds true that organizations can be regarded as an aggregation of resources. These resources can be combined with varying effectiveness, implying that some combinations of resources better utilize the potential of existing resources (Eisenhardt & Graebner, 2007). The alignment of resources to mutually support the effective use of one another can with the definitions above be seen as some sort of integration. Increasing an organizational level is demanding, requiring substantial efforts and resources (Barki & Pinsonneault, 2005). Although theories like RBV seek to explain at least some part of the mechanisms behind the increased organizational competitiveness, the relationship between organizational performance, integration level, and implementation effort to increase integration are still to a large extent unknown (Barki & Pinsonneault, 2005). What can be concluded is that some integration, alignment of organizational units, seems to be more cumbersome than others.

A common distinction is to differentiate between integration that targets processes internal to the organization and those that are external (Barki & Pinsonneault, 2005). As explained in chapter 1, this thesis has an internal focus, as M&A integration is about leveraging benefits related to the incorporation of a formerly external, but now internal unit. A second distinction is suggested between integration of the organizations primary processes (operational) and secondary processes (supportive, functional) (Barki & Pinsonneault, 2005). This different kind of integration can be described with various attributes: the type of dependency between integrated units, which barriers are normally faced, the potential benefits, efforts needed to leverage this benefits, and its underlying mechanisms (Barki & Pinsonneault, 2005). The properties for internal integration processes are summarized in Table 2.2. Thompson (2003) argues that interdependencies between units are the starting point for integration. These interdependencies could be of three types:

- Pooled, meaning that each part of the organization makes a contribution to the whole that form an organization. The different part of the organization does not, however, need to depend directly on each other.

- Sequential, the output of one is the input for another. Typical example is an industrial value chain.
- Reciprocal, the output of one part is the input for another, which in turn, directly or via proxy, is the input for the first unit.

Thompson (2003) and Barki and Pinsonneault (2005) found by deductive reasoning that the different dependencies are normally not evenly distributed over the organization. They argue that sequential and reciprocal dependencies are more frequent among operational than functional units, which is in conformity with Porter's value chain analysis (Porter, 1985). As the three dependencies are said to be hierarchical, pooled being the basic form, sequential containing a pooled aspect as well as further dependency, and reciprocal, in turn, being sequential plus something more, complexity of integration increases with dependency level (Thompson, 2003). Taken together, this means that integration of operational units requires more effort than integration of functional units, since the interdependency between operational units normally is of higher order than interdependencies between functional, or operational and functional units (Barki & Pinsonneault, 2005; Porter, 1985; Thompson, 2003)

Integration of an organization's operational units is normally associated with increased efficiency, while functional integration is likely to lead to organizational effectiveness (Table 2.2) (Barki & Pinsonneault, 2005). Existing research has isolated seven idealized mechanisms that should lead to increased integration (Glouberman & Mintzberg, 2001, Thompsson 1967). Standardization of work processes, output, competence, or norms are emphasized as integration improvements. Other measures that can be taken are direct supervision, planning, and mutual adjustments of units. From an IS integration perspective, it should be noted that in order to contribute to the organizational integration, IS integration has to contribute to these mechanisms. For example, standardization of work processes or output.

The M&A context constitutes a specific case of organizational integration. As the empirical phenomenon of M&A has increased in significance, researchers have adapted and specified the general models for organizational integration to the specific situation. Potential benefits of M&As and hampering conditions for their leverage are dealt with in chapter 3.

Table 2.2 Differences and attributes of Organizational Integration

Types of OI	Definition	Interdepen-dence types	Mechanisms of OI	Integration effort	Potential benefits of OI
Opera-tional	Integration of successive stages within the primary process chain (workflow) of a firm	Sequential Reciprocal	(PL), (DS), (SO) (SW), (MA)	High	• Greater manufacturing productivity • Greater firm competitiveness • Strategic advantages • Lower production and inventory cost • Reduced errors • Improved coordination
Func-tional	Integration of administrative or support activities of the process chain of a company	Pooled	(SN), (SSK)	Low	• Products more attuned to market • Greater interfunctional synergy • Greater new product success • Higher innovation rate

Source: Adapted from Barik & Pinsonneault (2005, p. 168).

Notes. OI Mechanisms (Glouberman and Mintzberg 2001, Mintzberg 1989, Thompson 1967/2003): MA, mutual adjustment; DS, direct supervision; SO, standardization of output; SW, standardization of work; SSK, standardization of skills and knowledge; SN, standardization of norms; PL, planning.

2.3.4 Anticipation or ability

Only a decade ago many companies were striving for (and enthusiastically supported by many academics) homogenous and standardized enterprise wide IS. With the result in hand, we can see that, in spite of the substantial efforts put into the quest, the foreseen architecture never was accomplished. Rather complex computer-based information infrastructures emerged as a result of pressure and changes to the organization in the external and internal context (Hanseth & Braa, 2001).

During later years, many authors started to emphasize the term Information Infrastructures as a competing, and more suitable, labeling of the aggregated information resources in modern companies (e.g. Star & Ruhleder, 1996). Hanseth and Braa (2001) argue that, in reality, rather complex information infrastructures are present in companies, fairly isolated and without stable IS with clearly diverging functionality. A contemporary IT base consists of a number of different systems and

technologies that are intertwined. Whether regarding the IS based information flows as a system or infrastructure, it is at least partly related to whether the objectives of IS should be based on an anticipation or ability view. The discourse above has been based on IS needing to be developed to meet requirements for supporting the business of the organization.

Planning for new IS initiatives thus implies an anticipation view, assuming it can be foreseen at least in broad term how the demand on IS should develop. The alternative would be to say that management of IS towards anticipated objectives is fairly impossible. Which demands need to be met in the future is impossible to say. Additionally, Hanseth and Braa (2001) claim that the technological invention is all but impossible to anticipate. For IS integration, this would mean that the future integration needs are impossible to assess in advance, as are the available means to implement that integration. This would then suggest a cability view of the objectives, saying that some sort of IS integration will be crucial in the future, but we do not know exactly when and which kind. The managerial task would be to create cability rather than developing IS in an anticipated direction.

It is important to stress that the different systems and components of the infrastructure are tightly knotted; the IT base has sometimes been compared to an investment portfolio, which, however, is a rather simplistic metaphor. "Investment portfolios are usually very flexible and easy to change, manage, and control. […] Infrastructures are different. The individual elements are very interdependent, and their size and complexity make them extremely difficult to control and manage." (Hanseth, 2000, p. 56) Corporate information infrastructures have been compared to concrete – they are fairly easy to transform before implementation, but when in place they are fixed and any changes require both time and efforts. Especially the huge ERP systems like SAP have been argued to be extremely hard to modify afterwards (Hanseth & Braa, 2001). The consequence is that future development becomes significantly path dependent, meaning that future development is to a high degree dependent on what currently exists. If regarding the IS resources as individual systems, that would imply an easy replacement of on single entity, which apparently is not the case.

While early IS integration attempts have focused on connecting individual IS to each other and are driven by clearly defined purposes (Johnson, 2003), contemporary ecologies of IS are tightly related to

many other IS (Hanseth & Braa, 2001). The aggregation altogether makes up an uneasy manageable arrangement where standards are developed, replaced or excluded along with technological progress and inclusions of new components into ever-changing environments where ongoing integration and disintegration becomes normality. The later technological developments that build on the logic of an ever-evolving installed IS base includes approaches, such as Electronic Data Interchange (EDI), EAI, EI, ESB and SOA, which are expected to increase in use during the forthcoming years. These and the many other flourishing abbreviations invented and nurtured by software vendors in collaboration with the business press and integration consultants, all have specific advantages and disadvantages.

Conceptually speaking, paralleled by the ideas of specialization and responsiveness, integrated systems are systems that work together even though they never were intended to do so by relating them to each other by some kind of interface. In more practical terms, there exists a number of ways of making the systems work together. The different possibilities do not permit summarization in one or two defining sentences, but the following section attempts to account for the different approaches as described in the literature and then relates them to the business needs that they should fulfill.

2.4 IS integration options

An IS may be related to another IS in several different ways, ways that all come with specific advantages and disadvantages. IS may be connected to other IS in different layers of the IS (Al Mosawi et al., 2006). In some cases the coupling needs to be made on an organizational level, also referred to as business level, in order to reap searched benefits. In other cases just shuffling data from one database to another will be sufficient. However, the integration of IS is normally not as straightforward as just interfacing one system to another. The above presentation shows how tightly coupled information infrastructures enforce a more comprehensive view of IS integration structure. The way several IS are interrelated has been shown to have great importance for the resources needed for integration, and is therefore a relevant managerial concern (Markus, 2000).

2.4.1 Levels of IS integration

Theorizing the concept of IS integration, several authors have approached the subject with the conceptualization of integration possibly taking place on different infological levels (Al Mosawi et al., 2006). Doing so reveals common characteristics between specific integration solutions that may become the basis for addressing advantages and disadvantages of the specific technologies.

Several authors have made efforts to sort the creation of bonds into different categories. The identified conceptualizations are summarized in Table 2.3, which also relates the conceptualizations to each other. The three main levels: *business*, *application*, and *technology* map roughly to the different levels of IS presented earlier in this chapter. In the same way as the organizational level of IS was explained, the major focus of this thesis as presented in chapter two, the business-level is where primary interest lies. Nevertheless, although the level of analysis is organizational, the underlying levels cannot be ignored (Orlikowski & Iacono, 2001). Integration on technical and application level have consequences also on a business level.

Table 2.3 Conceptualizations of IS integration levels[1]

Level	*Sublevel*	*References*
A. Technological		
	Data	(Linthicum, 2001; Pushman & Alt, 2001; Gerring, 2007; Star & Ruhleder, 1996; Samtani et al., 2002)
	Object	(Pushman & Alt, 2001; Gerring, 2007)
	Function	(Linthicum, 2001; Star & Ruhleder, 1996; Samtani et al., 2002)
B. Application		
	User interface/Presentation	(Linthicum, 2001; Samtani et al., 2002)
	Application interface	(Linthicum, 2001)
C. Business		
	Intra-organizational process	(Pushman & Alt, 2001; Gerring, 2007; Samtani et al., 2002)
	Inter-organizational process	(Gerring, 2007)

Integration on a *technical level* can be made either through integration of data, objects, or function. Data integration implies the migration of data between multiple data sources. The shared data can be used by many organizations, applications or resources (Al Mosawi et al., 2006). The advantage of data integration is its relative inexpensiveness. It

[1] The table is reworked based on Table 1 in Markus (2000) and Zhu (2005) in combination with Duke et al. (1999).

renders consistent data by a minimum of changes to source or target applications. However, as all integration taking place at the technological level, it ignores application and business logic. Bypassing the application layer implies limited real time transactional capabilities (Linthicum, 2001), and bypassing the business layer means that the coupling may not support the business needs.

The other two technological integration approaches, object and function integration, face the same limitations. However, the object integration has an advantage in its reusability, and a downside in its complexity. Function integration tries to solve the integration problem by streamlining and standardizing application functions and methods (Al Mosawi et al., 2006).

The most primitive form of *application level integration*, sometimes not even considered as a form of integration, is user interface integration (sometimes also referred to as presentation integration). Basically, the interface towards the user is developed to present data from several non-integrated systems (Linthicum, 2001). Web-based portals are typical examples of presentation integration. The advantages of user interface integration include easy development, as it requires a minimum of changes to existing IS and IT systems. The disadvantages are that no actual integration is taking place, systems become difficult to maintain and are unscalable and tightly coupled (Al Mosawi et al., 2006).

Application interface integration is more complex than user interface integration, but invokes application functionality. Through sharing of common logic, packaged or custom built applications are arranged to support business services (Al Mosawi et al., 2006).

On the *business integration level* integration work is carried out with the use of common abstractions of business processes. The approach has an imperative in the alignment of IS and business strategy. Business level integration can be divided into intra- and inter-organizational integration. It is noteworthy that the synergies related to the M&A are mostly of intra-organizational character (Lubatkin, 1983) and thus the choice to focus on intra-organizational IS integration in this thesis (see section 1.3.1 on level of analysis).

Process integration is more advanced than technological, and application integration as the logic for conducting business is included. Integration by business process level offers the most benefits, but is complex and expensive (Al Mosawi et al., 2006).

2.4.2 Integration structure

In practical terms, integration of IS involves the creation of some sort of linkage between different IS (Markus, 2000). This section of the thesis addresses the architectural options of how to actually undertake integration. According to Markus (2000, p. 10), "Systems integration refers to the creation of tighter linkages between different computer-based information systems and databases." The term "Information systems" is used by Markus in a technical sense as she describes four conceptual solutions to the integration problem, based on connections between applications and databases. Figure 2.3 presents schematic pictures of these alternatives. Although Markus has a technical perspective on IS, the conceptual approach can be used to emphasize differences in the way integration needs are fulfilled. A fifth approach to integration structure is not mentioned by Markus, due to its recent appearance on the scene. The service-oriented architecture is mentioned by, for example, Zhu (2005) to provide several advantages including flexibility and reusability.

The first solution that Markus presents is a point-to-point (P2P) alternative, where a software bridge, also known as interface, connects two applications directly to each other. Data from one application, A, is

Figure 2.3. Five approaches to IT-integration (Markus, 2000; Davenport, 2005; Zhu, 2005).

more or less automatically transferred to another application, B. If there is a need to integrate a third application, C, two new interfaces have to be built connecting to A and B, respectively. If a fourth application, D, needs to communicate with A, B, and C, three new interfaces need to be created, and so on… It is easy to imagine the complexity of such a system if many entities need to communicate with each other.

The first integration initiatives, ad-hoc in character, naturally conformed to a P2P integration strategy. The architecture has its benefits in its simple and straightforward approach where setting up one connector demands relatively few resources. The main disadvantage

is, of course, the complexity derived in larger systems with more connectors between systems.

To decrease the complexity, an approach that uses an intermediate layer between applications and databases called middleware can be used. Applications are modified to call, the middleware, M, instead of calling each other directly. The middleware, in turn, calls targeted applications or databases. As a consequence, each unit only needs two interfaces, one outgoing and one ingoing, to the middleware.

The third alternative is to adopt an enterprise-wide system, E, that is often referred to as an enterprise system or ERP (enterprise resource planning) system (Markus, 2000). In these systems the different applications employ a shared database. The result is that all applications' data are updated simultaneously, since they actually are using the same data. Numerous articles have been published on the advantages of enterprise wide systems, both in the business press and the academic journals (e.g. Duff & Jain, 1998; Gupta, 2000; Buck-Lew et al., 1992). Implementing enterprise wide systems can be extremely rewarding. By streamlining data flows throughout an organization, these systems could dramatically affect the company's efficiency and bottom line. However, while promising tempting advantages, major risks are also lurking in the swells:

> Not only are the systems expensive and difficult to implement, they can also tie the hands of managers. Unlike computer systems of the past, which were typically developed in-house with a company's specific requirements in mind, enterprise systems are off-the-shelf solutions. They impose their own logic on a company's strategy, culture, and organization, often forcing companies to change the way they do business. Managers would do well to heed the horror stories of failed implementations. (Davenport, 2005, p. 121)

The field of the enterprise wide system is maturing and we are beginning to see the consequences of the large initiatives of the late 1990's whose predictions of the foreseen monolith-structures seldom came true. Instead, as explained earlier, complex and evolving information infrastructures still flourish (Hanseth & Braa, 2001). However, although the reality shows exceptions to enterprise-wide structures, the idealized state may be pursued in M&A initiatives as exceptions do not compulsorily have to be found in the parts that are touched upon in the integration process.

Meta level integration works by extracting data from source systems into data warehouses (Davenport, 2005). The approach does not actually integrate existing systems with each other, but adds a meta-layer on which all forms of sophisticated analyses can be made (Markus 2000). The approach has, just like the other conceptual integration solutions, its advantages and disadvantages. Pros include the achievement of data integration without making changes to the existing systems or business processes and the potential to include external data, e.g., public statistic data or data from collaborative partners. On the other hand, incompatible and poorly designed data structures in the source systems are also reflected in the data warehouse. Meta level integration integrates data on a highly aggregated level which does not permit the integration of business processes (Markus 2000).

One of the more topical concepts that currently flourish in the integration literature is SOA. SOA is sometimes referred to as a type of software, sometimes as an architectural design, and sometimes as a concept for solving an integration need. Granebring (2007) differs between definitions of SOA that regard it as integration *technology* (Biernerstein et al., 2006; Duke et al., 2005) and definitions of SOA as an integration *framework* (Erl, 2005; Feng et al., 2005). The common understanding, however, is that SOA consists of a collection of functional elements called services. The services are software modules that are accessed by name via an interface, typically in a request-reply mode (Yefim, 2003). The services sum up reusable business functions that are loosely-coupled to other services, and are called upon through connection technologies (Wong-Bushby et al., 2006). This adds flexibility to the business process, and thus standardization and interoperability can be achieved (Lager, 2005). Feng et al. (2005) describe the characteristics of SOA as three levels:

- Operations: Computational units represent single logical units of work that are executable parts of a system. Examples for operations are instructions, basic blocks, routines, classes, compilation units, components, modules or subsystems.
- Services: Represent logical groupings of operations. For example, in a digital library system, User profiling is viewed as a service, and then Maintaining a user profile, Store search profile and Notify user of updates per profile represent the associated operations.

- **Business Processes:** A long running set of actions or activities performed with specific business goals in mind. Business processes typically include multiple service invocations.

The benefits of using SOA are characterized by the reuse of components, the potential of reduced IS costs and improved business agility that have resulted in many organizations deciding to start working with SOA (Knorr & Rist, 2005). SOA providing more reusable components means that IS apartments do not need to reinvent the wheel and thereby can decrease the development costs (Datz, 2004). Additionally, a well-designed SOA lets organizations deal with multiple smaller integration projects with less capital and resource investment, as opposed to the high investment and resource commitments associated with traditional solution development architectures (Classon, 2004). Finally, business agility can be improved with SOA, as with packaged software suites that for a long time were the standard and the company needed to accept whatever the vendor could provide (Lager, 2005).

Criticism of SOA is very limited in the existing literature. As organizations start to embrace SOA, the downsides of the approach will come into light. SOA most probably cannot be blamed for the riots in Kenya or the democratic crisis in Pakistan, but for the individual organization is such a paradigmatic change that SOA for corporate IS strategy logically comes with a comprehensive range of problems and obstacles. Based on the initial use of SOA, potential problems have been identified that include migrating legacy systems (Wong-Bushby et al., 2006), learning a new technology (Henningsson et al., 2007), and interoperability of services (Cohen, 2006). The idea behind SOA is that IS are decomposed into blocks that cover specific functionality. Today's organizations are adopting SOA without any standardization body, such as the World Wide Web-consortium (W3C) or OASIS at present. This could potentially create problems of interoperability and scalability of SOA based IS in the future (Cohen, 2006).

2.5 Contribution of chapter 2

This chapter started with a defining discussion on the core concepts needed to address IS integration. The discussion included a description

of how the problem of IS integration evolved from ad-hoc creation of bridges between individual components to complex infrastructures that are essential for most contemporary businesses.

2.5.1 Summary of key concepts

The aim of the chapter was, apart from straightening out the confused vocabulary, to position the study in relation to prior research in the field and to elaborate upon potential theories for inclusion in the theoretical framework for IS integration in M&A. It was argued that a view of IS as fulfilling an organizational need was required and that inclusion of the human component as data interpreter was needed to capture the organizational need. In other words, that a working definition of IS should include not only the pure IT system, but also the human involvement in the information creation process, the processes it was supposed to support, and the context within which the IS existed. This conclusion, perhaps the most important drawn in chapter 2, has fundamental implications for the research design presented later, as it clearly affects how the boundaries of the study are settled and directs the focus towards the ability of IS to support business processes.

A review of existing research revealed that three levels related to IS integration were relevant to consider. Apart from the IS level itself, the Organizational Integration was relevant to understand the purpose of IS integration work and how it could contribute to organizational performance. Further, the IT system level, addressing in more practical terms how the enabling IT integration could be implemented also has significant implications on the IS level. None of these levels can possibly be ignored if one contends to approach the subject of IS integration comprehensively.

Thus far, the theoretical review has focused foremost on the levels of IT system, IS and organizational integration. Strategic integration has purposely to a large extent been ignored. This is because it is of little use to address organizational strategy in general terms. The concept is too complex and inclusive to account for generally in a productive manner. Instead, the next chapter has a distinct focus on the strategic issues of M&A, the strategic elements that are relevant for IS integration in M&A.

What has been established is the understanding that the term 'IS' does not refer to a homogenous phenomena. IS should be divided into subcategories based on distinct characters. As this thesis is concerned with the organizational implications of IS, IS should be divided by how it contributes to organizational objectives, i.e., by its functionality.

We also presented different architectural approaches to actually implement integration needs. The choices represent fundamentally different kinds of integration processes with respect to required work activities and technological use. Advantages and disadvantages of integration by point-to-point, middleware, enterprise-wide, and meta-level architectures were emphasized. The decision regarding which infological level to make connections is also an architectural decision that has to be made. It was argued that the integration decision showed a significant path dependency, meaning that existing systems and their history limited the alternatives for future integration.

The key concepts that are essential for the development of the next chapters are summarized in Table 2.4. The concepts can be group into three categories: Organizational Integration, IS Type, and Integration Architecture. Together, they constitute the essence of concerns regarding IS integration in contemporary business.

Table 2.4 Classification concepts in Chapter 2

Key concept	*Description*	*Classification*	*Indicative references*
Organizational Integration			
Interdependency type	Organizational units with relations to each other can have three types of mutual dependencies	Pooled, Sequential, Reciprocal	(Thompson, 2003)
Integrated Activity	Which part of the organization being object for integration is related to the amount of resources needed.	Operational, Functional	(Barki & Pinsonneault, 2005)
IS Ecology			
Function	A contemporary IS base consists of several heterogeneous systems. A typology based on supportive function is argued appropriate for this framework.	Infrastructural, Informational, Transactional, Strategic	(Weill & Broadbent, 1998)
Integration Architecture			
Integration level	IS can be integrated on several different levels, with individual advantages and disadvantages.	IT, Infological, Organizational (business)	(Al Mosawi et al., 2006; Iivari, 2007)
Integration structure	The actual linkage between two or more systems can be organized in several ways.	P2P, Middleware, Enterprise-wide, Meta-level, SOA	(Markus, 2000; Davenport, 2005; Zhu, 2005)

2.5.2 Key concepts and their mutual dependencies

In this chapter several models and concepts have been introduced that show the potential of explanatory power when approaching IS integration in M&A. What makes the subject complex and intricate is that the concepts naturally do not exist in a vacuum, but rather decisions and actions targeting one aspect have far reaching implications for other concepts. The dependencies are summarized in Table 2.5 and depicted in Figure 2.4. These dependencies are regarded as relations between two units, rather than an obligating dependency of some independent and dependent variable.

Table 2.5 Relational concepts in Chapter 4

Relation	*Description*	*Indicative references*
Organizational Integration – IS ecology		
	Operational integration requires integration of the internal value chain, which requires heavy integration of Transactional IS. Functional integration, in turn, is related to integration of Information IS. The more complex dependency of operational units should make integration in Transaction IS more demanding in terms of resources and time, compared to Informational IS.	(Barki & Pinsonneault, 2005; Weill & Broadbent, 1998)
IS ecology – Integration Architecture		
	If integration of Transaction IS, as suggested, is more demanding and requires deeper coupling than Informational IS then it have consequences for selection of integration architecture. Integrating a whole operational chain with point-to-point architecture should logically be to complex. In this case a single system, not perhaps a complete Enterprise-wide, but at least some sort of "process wide" architecture can be claimed more suitable.	(Markus, 2000)
	If the IS is business critical then integrating with point-to-point or middleware could be preferred in favor of an enterprise wide system. Implementing a new enterprise wide system is a highly risky and complicated process. Integrating existing systems is argued less difficult and risky than a complete transition	(Markus, 2000)

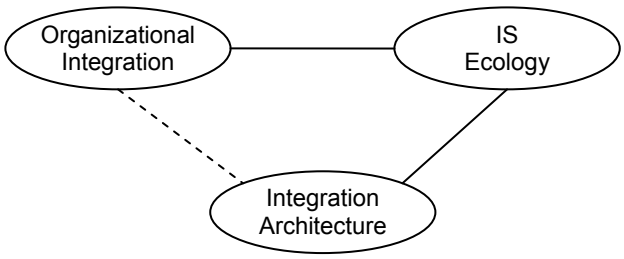


Figure 2.4 Relations between key constructs

Organizational integration can be divided into operational and functional integration. This relates to the classification of IS, as some types of IS relate to operational and some primarily to functional. Operational integration requires integration of the internal value chain, requiring heavy integration of Transactional IS. Functional integration, in turn, is related to integration of Information IS. The more complex dependency of operational units should make integration in Transaction IS more demanding in terms of resources and time, compared to Informational IS. What is meant by regarding this as a mutual relation, rather than a deterministic dependency from one variable to another, is that this can also be seen the other way around. If one, for some reason, does not want to pursue integration of Transaction IS (it is complex, requires recourses and competences etc.), it would be impossible to reach operational integration and the benefits related to that.

Further, it was explained that integration architectures have different advantages and disadvantages. For example, some are more suitable for heavy integration than others are. If integration of Transaction IS, as suggested, is more demanding and requires deeper coupling than Informational IS, then there will be consequences for the selection of integration architecture. Integrating a whole operational chain with point-to-point architecture should logically be too complex. In this case a single system, perhaps not a complete Enterprise-wide, but at least some sort of "process wide" architecture can be claimed more suitable. As explained above, the different architectures are idealized conceptualizations and a real integration project would naturally contain elements of different architectures.

Chapter 2 has accounted for Integration and IS integration as general phenomena, without special emphasis on the specific context of M&A. The specified purpose and research questions have naturally been used as guidance of theory selection, but thus far, the properties of the M&A process have largely been left uninvestigated. The next chapter will, however, be devoted to the properties of M&A that can be used to describe and explain the relationship between IS integration and M&A.

3. Research on Mergers and Acquisition

Research on M&A may be divided into three broad strands (Larsson, 1990; Risberg, 2003). The first strand focuses M&A as a tool for corporate strategy, the second addresses the issue of organizational compatibility between the two companies, and the third studies events and activities during the M&A process with special attention being made to the process of integrating participating organizations. These three strands and their implications for IS integration are addressed in this third chapter. To enable an unambiguous discussion, there is the need to first clarify some of the field's key terms.

3.1 Defining Mergers and Acquisitions

The notions of 'merger' and 'acquisitions' along with the combined term 'merger & acquisition' and its abbreviation 'M&A' are frequently used in the management literature. Although often used interchangeably, there are some differences in the implications of the terms. The word 'merger' suggests a neutral combination of two objects while 'acquisition' is derived from the verb 'acquirer' and has a meaning of takeover. Mergers usually involve companies of equal size, while in acquisitions the acquiring company tends to be of larger size than its counterpart (Krekel et al., 1969). In a technical sense, 'acquisition' describes any transfer of ownership, whereas 'merger' describes a transfer of ownership in which one entity legally disappears into the other, or both entities disappear into a third entity created for the purpose of the merger (Lajoux, 1998). However, many have argued that the difference between mergers and acquisitions only is a legal jurisdiction. What look like an acquisition may in a legal sense be a merger, and vice versa (Mohr, 1982; Giacomazzi et al., 1997). Therefore, it is argued that mergers and acquisitions may be studied as one phenomenon, a research topic that has evolved into its own research domain, usually abbreviated as M&A (de Marco et al., 2005).

The distinction applied here is one of organizational processes (Mohr, 1982; Giacomazzi et al., 1997). The key factor from an organizational perspective is the extent to which one firm is expected to give up its independence to the other (Krekel et al., 1969). For clarification, merger and acquisition in this thesis refers to two idealized states, the *neutral combination of equals* and the *takeover of a less powerful organization by a more powerful* organization (Figure 3.1). In reality, combinations seems to fall somewhere between the two extremes. It is necessary to point out the specific differences and meanings of these expressions as some of the research presented in this chapter relates specifically to one of the combination types. When research that does not make any distinction between the operation is referred to, the notation M&A is used.

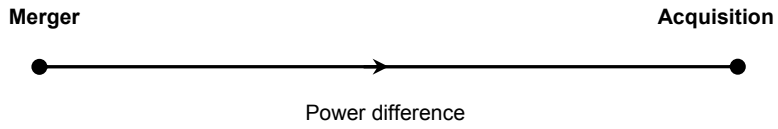


Figure 3.1 Merger and Acquisition as idealized states with power difference as running variable.

Apart from referring to the legal label of two business entities joining forces, mergers also have the more general meaning of combining two entities into one. Hence, any acquisition will usually involve some merger activity, but the merger of two entities does not imply any acquisition made earlier. To avoid confusion, this denotation is here avoided; instead, synonyms such as combination or consolidation are used.

3.2 M&A as a tool for corporate strategy

According to Trautwein (1990), most observers agree that M&As are driven by a complex pattern of motives, and no single approach can render a full account. At the bottom line, however, the rationale comes down to being about creating value for the corporation's shareholders. According to Lubatkin (1988), M&As can create value for its

shareholders in two ways: either through an increase of stock returns (appreciation plus dividends) or through a decline in shareholder risk. Shareholder risk, or systematic risk as it also labeled, is basically the variability in a firm's stock returns. Different strategic perspectives provide different explanations on how this value creation may be pursued. Contemporary strategy research may be summarized in three broad perspectives: Porter's Industrial Organization (I/O), the Resource Based View (RBV) of the firm and the strategic process perspective (Hedman & Kalling, 2003). These three perspectives will be used to describe the strategic potential of the M&A act. The following text is an extended and elaborated version of a discussion on the subject matter that was initially published in Henningsson (2007).

3.2.1 Industrial organization

During the 1980s a number of studies surveyed the potential of M&A to actually create additional shareholder value. Generally, these studies had difficulties in establishing any relation between increased value and the M&A initiative; in contrast, it was generally agreed that as much as two thirds of all consolidation initiatives actually failed in increasing shareholder value. Based on the 'at that time' prevailing strategic paradigm largely dependent on Michel Porters theories of the I/O (Porter, 1985), researchers searched to explain which mergers succeeded and which did not. The underpinning suggestion of the I/O perspective is that external conditions act as forces that are decisive for the success of a company (Porter, 1985).

The concept of synergy is fundamental to understanding the rational reasons as to why companies participate in merger activities, as synergies in this context are defined as to what is occurring when two units can be run more efficiently and/or more effectively together than apart (Lubatkin, 1983). Based on the strategic literature, it was argued that all mergers were fundamentally different in nature and the different types of combinations that enabled different potential synergies. The literature describes three basic types of positive synergies as possible outcomes of mergers*: technical economies*, *pecuniary economies* and *diversification economies* (Lubatkin, 1983).

Lubatkin (1983) manages to identify six types of technical economies in the literature (Table 3.1). *Marketing, production, experience, scheduling, banking,* and *compensation* are all economies of

scale that occur when the physical processes inside the firm are altered so that the same amounts of inputs produce a higher quantity of output, or the same quantity of output is produced using fever resources. Pecuniary economies correspond to the firm's capability to dictate market prices by making use of market power achieved primarily by size. The two sorts of pecuniary economies *monopoly* and *monopsony* come from the corporation's ability to force buyers to accept higher prices, and the ability to force suppliers to accept lower prices, respectively. Pecuniary economies do not offer any genuine efficiency improvements, compared to technical economies that lower the cost per produced unit, but rather represent a relocation of revenue from the less powerful to the more powerful (Lubatkin, 1983).

Table 3.1 Synergies related to mergers and acquisitions

Synergy	*Source*	*Description*
Technical economies		
Marketing	Shepard (1979)	Scale economies in marketing and branding
Production	Shepard (1979)	More efficient production of larger quantities
Experience	Boston Consulting Group (1968)	Reduction in cost that come with accumulated experience with a common technology
Scheduling	Shepard (1979)	Occur in vertical mergers when two levels of production are joined
Banking	Howell (1970)	Reduction in outstanding cash balances as consolidation reduces banking relationships
Compensation	Howell (1970)	Consolidation can lead to savings per employee for offerings such as health and life insurance
Pecuniary economies		
Monopoly	Porter (1980)	Ability to force buyers to accept higher prices
Monopsony	Porter (1980)	Ability to force suppliers to accept lower prices
Diversification economies		
Portfolio Management	Lewellen (1971)	Consistency of assets which markets' development are negatively correlated with each other
Risk Reduction	Higgens and Schall (1975)	Lower transaction costs to stakeholders

Source: (Lubatkin, 1983)

Finally, diversification economies are achieved by improving the firm's performance relative to its risk attributes, meaning to spread risk among unrelated markets and products through a strategic product portfolio (Lubatkin, 1983). Following portfolio theory, the best set of products and markets is where the earnings in one industry are negatively correlated with earnings in another industry included in the portfolio (Lubatkin, 1983).

One such classification that has been a common starting point for many M&A researchers is the FTC-Framework (1975). The classification scheme is based on potential synergies, and classifies M&A into *horizontal*, *vertical*, *product concentric*, *market concentric,* and *conglomerate* categories. Larsson (1990) made an effort to improve the model into a systematic framework (Figure 3.2). In Larsson's framework the category of vertical integration is split into two categories, *vertical backward* and *vertical forward*. Apart from this refinement, the categories correspond to the FTC categories. In the framework M&As are categorized by the two companies relation in terms of: a) the company's products relation in a potential value chain, and b) the company's market relation.

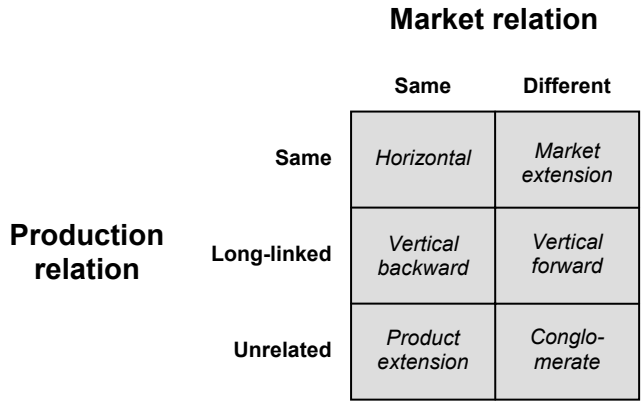


Figure 3.2. A systematic framework for the FTC typology of M&A. Source: Larsson (1990)

Both dimensions of the FTC-framework have been claimed related to Porters models, which does not seem unlikely. Porter's value chain model (1985) relates to the product relation-dimension, where the place in an industry's value chain determines whether the M&A is horizontal, long-linked or unrelated. Horizontal means that the combining units are potential competitors, occupying the same position in an industry's value chain. The long-linked relation means that the two units are active in the same industry but hold different positions in the value chain. The units have thus a potential buyer-seller relationship. Finally, the unrelated product extension means that the two units are active in different value chains. Porter (1987) argues that the last category of M&A normally does not deliver added financial value as it does not fit in the competitive strategy of an organization.

Porter found that 74% of the unrelated M&As were divested again within a few years.

The second dimension in the FTC-framework is market relation. According to Porter (1987), only M&As into attractive markets are normally able to deliver added financial value. In Porter's view, five forces determine the competitive rivalry within a market:

- The intensity of competitive rivalry: Numbers of competitors, industry growth, etc.
- The bargaining power of customers: Buyer concentration to firm concentration ratio, buyer volume, buyer price sensitivity, etc.
- The bargaining power of suppliers: Supplier switching costs relative to firm switching costs, degree of differentiation of inputs, etc.
- The threat of the entry of new competitors: the existence of barriers to entry (patents, rights, etc.), brand equity, capital requirements, etc.
- The threat of substitute products: Buyer propensity to substitute, buyer switching costs, etc.

M&As can be used to change the conditions for the market, striving to make it more profitable (Porter, 1987). If the two units in an M&A occupy the same position in the value chain in the same market, they contribute to the first force above, the intensity of competitive rivalry. By merging, they thus reduce the competition within the market. Similarly, M&As can alter the basis for the other forces. If pressure from customers or suppliers is too intense, a vertical M&A may alter the conditions. M&As can also be used to meet the force of new competitors (by simply acquiring promising competitors) or meet the force of substitute products through M&A entering into a new market that may rule out existing businesses.

M&As can thus be made to change the structure of an industry (described by the five forces model) and to change a company's position within an industry. Porter's three generic strategies that, according to Porter (1980), can lead to profitable business suggest that companies should strive for cost leadership through company size or focus on a certain niche of the industry. An M&A can be made to acquire market

leadership in terms of size and turnover or to address a more profitable niche of the industry (Porter, 1987).

The limitation of the framework above is that although an M&A at the bottom line is about making two units function as one, Porter's models, and consequently the framework that extends his work, do not consider the inside of the organizations and the possibility of actually merging the units.

3.2.2 RBV

The I/O perspective emphasizes the contextual pressure and the ability to adjust accordingly to changes in the environment as decisive for successful corporations. In contrast, RBV put forward individual and combined internal *resources* as determinants for success (Barney, 1991). According to Eisenhardt and Martin (2007), the RBV stipulates an organization being the aggregation of its resources. How successful a corporation is, is dependent on the *value*, *rareness*, and *substitutability of* its resources. A resource is valuable if it contributes to the organizational performance by lowering costs or increasing selling prices. If the resource also is rare and difficult/expensive to imitate or substitute, the resource contributes to sustained competitive advantage.

Organizational capabilities, the ability to perform an action using the available resources, can be seen as a particular category of resource. Grant (1996a) describes organizational capabilities as the integration of knowledge from different individuals within an organization to perform specific activities. Examples of organizational capabilities include new product development, fast response capability, and innovation (Grant, 1996b).

A development of the capability concept is the concept of *dynamic capabilities*. Explained by Teece et al. (1997, p. 515):

> We refer to this ability to achieve new forms of competitive advantage as 'dynamic capabilities' to emphasize two key aspects […]. The term 'dynamic' refers to the capacity to renew competences so as to achieve congruence with the changing business environment; certain innovative responses are required when time-to-market and timing are critical, the rate of technological change is rapid, and the nature of future competition and markets difficult to determine. The term 'capabilities' emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and

> external organizational slulls, resources, and functional competences to match the requirements of a changing environment.

Applying RBV as strategic perspective thus implies a view that the creation and deployment of resources and capabilities are key managerial issues:

> The key to a resource-based approach to strategy formulation is understanding the relationships between resources, capabilities, competitive advantage, and profitability - in particular, an understanding of the mechanisms through which competitive advantage can be sustained over time. (Grant, 1991, p. 114)

The RBV perspective is the currently predominating perspective in strategy research, and the use in IS research is becoming increasingly popular (Hedman & Kalling, 2003). In the M&A field it has primarily manifested its presence through articles addressing organizational compatibility as a hampering factor to consider when planning for the synergetic effects described above. Organizational compatibility has been addressed from many different perspectives. Risberg (1999) reports it being discussed in terms of financial fit, business style fit, fit of assets, management styles fit and cultural fit.

The reason behind many M&As is the desire to better utilize exiting resources by combining them with new ones (Cording et al., 2002). The view of Prahalad and Hamel (1990) is closely related to the rational between many divestments and acquisitions. As companies seek to focus on their core competences (the wording the authors use for key organizational capabilities), they divest units away from their core business and core competence in order to be able to strengthen their position in their main business. In doing so, they enable synergetic potentials related to a combination of unique resources, as well as better use of capabilities and of internal assets. However, for reasons such as insufficient integration, unawareness, and unfamiliarity, companies generally fail in utilizing the full combination potential that could be reached by combining resources across the former organizational border (Capron, 1999).

For companies, such as Mexican Cemex, who have M&A as an integrated part of their growth strategy, the ability to identify targets, plan, manage, and eventually implement M&As can be seen as a strategic organizational capability (Miller, 2002). Zollo and Singh

(2004) regard post-M&A integration as a capability that can be improved by deliberate learning processes. Both practitioners and researchers have often argued that firms with previous acquisition experience will do better than those without such experience (Lubatkin, 1983), an assumption that seems to make sense. However, Haspeslag and Jemison conclude that "nothing can be said or learned about acquisitions in general" (1987, p. 53); a study by Lubatkin (1982) surprisingly failed to find a significant relationship between acquisition experience and performance. Haleblian and Finkelstein (1999) explain the result of Lubatkin's study by inappropriate measurements of acquisition performance[2]. In their own study, Haleblian and Finkelstein (1999) found that there exists a U shaped relationship between acquisition experience and performance. Their findings propose that relative inexperienced acquirers, after making their first acquisition, inappropriately generalize knowledge to dissimilar acquisitions, while more experienced acquirers appropriately distinguish between their acquisitions. Other studies have also found positive relationships between experience and performance (Bruton et al., 1994; Fowler & Schmidt, 1989; Hitt et al., 1993). These studies are, however, based on relatively small samples.

3.2.3 Strategic process perspective

While both I/O and RBV focus the content on the corporate strategy, the strategic process perspective focuses on the strategic process (cf Mohr (1982): variance vs process theory). I/O and RBV both have ideas of the optimal competitive situation, but say very little of how to actually go there. With the argument of more practical usefulness, research on the formation of corporate strategy as an ongoing process was added to the strategic field (Bengtsson, 1992). In process research the interest is in events, states and their relation to each other (Van de Ven & Poole, 1995). The strategic process perspective is less homogenous than the two earlier presented perspectives. Contributions have sometimes little in common, rather than the focus on the strategic process. A rough division can be made into contributions that apply a

[2] Haleblian and Finkelstein (1999) argue that Lubatkin's (1982) study was constrained by a reliance on monthly market returns, instead of daily returns, to measure acquisition performance.

rational, incremental or organizational (i.e. political, cultural, knowledge etc.) view of the strategy process.

The process perspective on M&A emphasizes that the M&A process is in itself an important factor, in addition to or even as an alternative to strategic and organizational fit, that affects the outcome (Risberg, 1999). Mintzberg (1994) noticed an implicit or explicit assumption of content oriented strategy models that the strategic process is rational and straightforward. Mintzberg (1994) contested this, arguing that the corporate strategy was made up retrospectively of the emergent actions a company took. Not by formal strategic plans. Mintzberg argued that uncertainty about the future leads to incrementalism, short planning cycles, and tentative actions. The implicit assumption of a rational and straightforward strategic process that Mintzberg maintains is highly visible in current M&A process research. Attempts to model the whole M&A process have frequently ended up in phase models that in the terminology of Van de Ven and Poole (1995) can be labeled as life-cycle models.

> The typical progression of change events in a life-cycle model is a unitary sequence (it follows a single sequence of stages or phases), which is cumulative (characteristics acquired in earlier stages are retained in later stages) and conjunctive (the stages are related such that they derive from a common underlying process) (Van de Ven & Poole, 1995, p. 515).

The category of theoretical contribution conforming to this pattern includes Haspeslagh and Jemison (1991), Graves (1981), Aiello and Watkins (2000), Breindenbach (2000), and Buono & Bowditch (1989). Basically they are conforming to the same underlying logic. There is a pre-M&A period when the organization tries to elicit as much information about the other organization as possible, and try to envision how the two organizations could be joined in a way that implies a more efficient and/or effective total. After the deal is closed, the work of actually implementing the prospective plans is carried out. The rational for using phase models has been to distinguish different events and activities of each stage, thereby furthering the understanding of the M&A process and how it can be managed (Haspeslagh & Jemison, 1991). However, it should be noticed that the above reviewed models do have imprecisely established frontiers; many processes seem

to be active in more than one phase and it is hard to say when one phase ends and another begins (Lohrum, 1992; Risberg, 2003).

As stressed before, the underlying assumption is in conflict with Mintzberg (1994), but there is also a conflict with other strategic process writings. For example, Burgelman (1983) focuses on corporate innovation and entrepreneurship and concludes that an experimentation-and-selection approach is necessary. Also Quinn (1978) finds the real strategic process lacking resemblance with the theoretical models: "When well-managed major organizations make significant changes in strategy, the approaches they use frequently bear little resemblance to the rational-analytical systems so often touted in the planning literature" (Quinn, 1978, p. 7). The formal, rational strategic planning approach describes a teleological, goal oriented process. Although not frequently favored by strategy process researchers, contributions conforming to this strategic idealism do exist (e.g. Chakravarthy & Lorange, 1984). In a teleological process the direct relation between events of state is of minor importance; what glues the process together are the shared objectives towards which the process is directed. For this process, Mintzberg prefers to use the term 'strategic programming' but, in contrast to Quinn (1978) and Burgelman (1988), he emphasizes the necessity of this activity.

The third class of studies on the M&A process has a focus on organizational factors such as politics, culture, and knowledge. M&As easily draw attention to political issues since they by nature have a dialectic process, as two units should be combined. Lubatkin (1988) notices that often the advantages of M&As that offer the greatest potential in theory also are the most difficult to achieve in practice, as M&As tend to destroy non-economic value for those who are supposed to create economic value. Explained by Haspelslagh and Jemison (1987, p. 56):

> Ironically, acquisitions often destroy noneconomic value for those who are asked to create economic value after the transaction is made. Creating economic value requires the cooperation and commitment of operating-level managers of both firms in order to combine the skills, resources, or knowledge of the two firms. Yet it is precisely this group and their subordinates for whom the acquisition destroys noneconomic value through the loss of job security, status, or career opportunities.

Acculturation in M&As is the outcome of a cooperative process whereby the beliefs, assumptions, and values of two previously independent work forces form a jointly determined culture (Larsson and Lubatkin, 2001). As anecdotal evidence pointed towards culture clashes being important reasons for failed M&As, researchers started to theorize on the phenomena during the 1980s. Larsson and Lubatkin (2001) examined prior research and found that the cultural issues had been studied in terms of person-organization fit, social anthropology, relational demography, the attraction-selection paradigm, social movements, relative standing, and national culture differences. Together, these complementary theories help to explain why people at the target company often face considerable pressure to conform to the values and management practices of the acquirer, the reasons why these pressures tend to be resisted, and the consequences of that resistance. To underscore the importance of cultural integration, Larsson and Lubatkin (2001) refer to a survey of 200 European chief executive officers (Booz, 1985) which drew the conclusion that the ability to integrate organizational cultures, acculturation, is more important to M&A success than financial or strategic factors. Larsson and Lubatkin (2001) highlight that culture clashes has been found to result in lower commitment and cooperation among acquired employees, greater turnover among acquired managers, a decline in shareholder value at the acquiring firm, and a deterioration in operating performance at the target.

3.3 Organizational integration in M&A

The strategic dimension of M&A addresses potential synergies that a combination of two organizations could generate. However, as more and more empirical data pointed in the direction that most M&A failed to leverage its synergetic potential, a new dimension was added to the field of M&A research – organizational fit. Organizational fit targets how well two corporations match in their respective administrative systems, corporate cultures, personnel characteristics, and other organizational aspects (Jemison and Sitkin, 1986). The compatibility is seen as decisive for M&A outcome. Compatibility has been addressed from many different angels. Risberg (1999) found that it had been discussed in terms of financial fit (Salter and Weinhold, 1981), business

style fit (Davies, 1968), fit of assets (Shelton, 1988), management styles (Lubatkin, 1983; Marks, 1982) and cultural fit (Nahavandi and Malekzadeh, 1988). From an IS integration perspective, cultural fit and human reactions are worthy of special attention.

3.3.1 Typologies based on organizational fit

Nahavandi and Malekzadeh (1988) suggest a typology with four modes of acquisition: integration, assimilation, separation, and deculturation (Figure 3.3). The four categories describe how the two organizations adopt to each other and resolve emergent conflicts. The integration mode occurs when members of the acquired company wish to preserve their own culture and identity while at the same time need to be willing to be integrated into the acquiring corporation's structure. In the assimilation mode the acquired company abandons its culture and adopts the culture of the acquirer. When the two companies have little in common, regarding both business and culture, separation is likely to occur. The final mode is deculturation, something that may take place when the acquired company does not value its own culture, but also rejects the culture of the acquiring company.

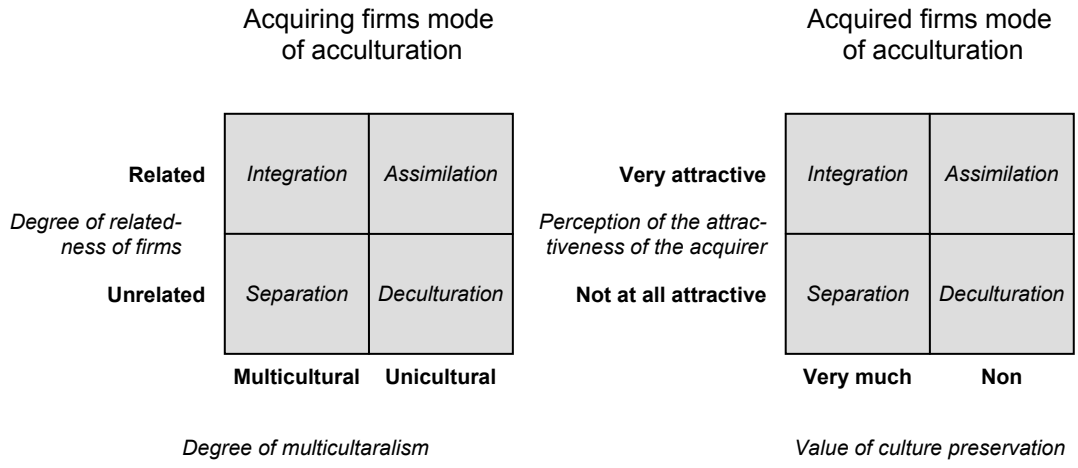


Figure 3.3 Modes of acculturation. Redrawn from Nahavandi and Malekzadeh (1988, p. 83)

Another integration typology is based on the desired level of integration. Haspeslagh and Jemison (1991) proposed a differentiation of integration approaches into four categories: absorption, preservation,

symbiosis, and holding (Figure 3.4). The two dimensions, strategic interdependence and organizational autonomy, were found to be the two most important forces for deciding on the integration approach. Haspeslagh and Jemison's categories can be compared to Napier's (1989) classification, who, also focusing on the intention, founded the three categories: extension, collaboration, and redesign. Napier's extension category roughly corresponds to Haspeslagh and Jemison's preservation, collaboration to symbiosis, and redesign to absorption. Holding is not really seen as an integration category by any of the authors, since it involves very little of integration activity.

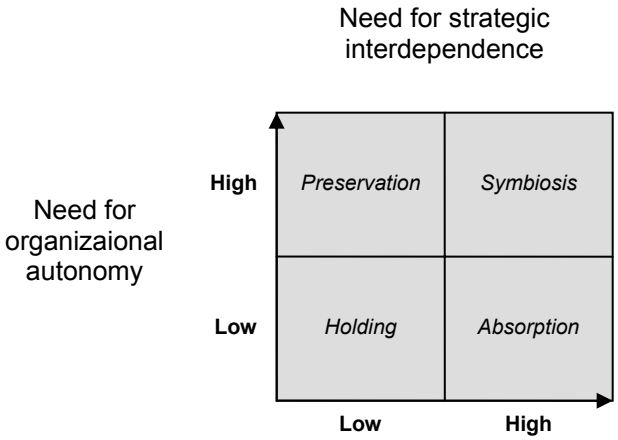


Figure 3.4 Integration typology based on desired level of integration.
Source: Haspeslagh and Jemison (1991, p. 145)

3.4 The M&A process

The third strand in M&A research addresses M&A from a process perspective. The desire to regard mergers as processes stems from the insight that merger implementation is a complicated activity to actually carry out, no matter which synergetic or organizational potentials are estimated. The process perspective emphasizes that the M&A process is an important factor, in addition to or even as an alternative to strategic and organizational fit, that affects the outcome (Risberg, 1999). In process research the interest is in events, states and their relation to each other (Van de Ven and Poole, 1995). Studying M&A from this perspective has enabled researchers to reveal additional information on

M&As that will be presented in this section. Much of the research utilizing the process perspective has highlighted the later stages in the process of merging two entities, but according to Haspeslagh and Jemison (1991), every step of the M&A process is vital for the final outcome and should be considered in M&A research.

3.4.1 Phase models

Attempts to model the whole M&A process has frequently ended up in phase models that in the terminology of Van de Ven and Poole (1995) can be labeled life-cycle models. "The typical progression of change events in a life-cycle model is a unitary sequence (it follows a single sequence of stages or phases), which is cumulative (characteristics acquired in earlier stages are retained in later stages) and conjunctive (the stages are related such that they derive from a common underlying process)" (Van de Ven and Poole, 1995, p. 515). The starting point is normally set at the first initial contact between the two involved entities, but where the process ends is more difficult to say. Marks (1982, p. 38) suggests that the process "…is best considered as an open-ended period that extends to include any change in the people or systems involved that is attributed directly or indirectly to the merger. Some results of a merger or acquisition may not be apparent until a few years following the combination." Two years is put forward as a timeframe within which most changes normally have occurred and the situation becomes somewhat stable (Ashkanasky & Holmes, 1995; Buono & Bowditch, 1989). Walter (1985) suggests that it takes up to three to five years before the acquired entities have fully adapted to the new context and in certain cases adoption has not occurred even after twenty years (Levinson, 1970).

Haspeslagh and Jemison (1991) identify and describe three major M&A phases: 1) idea and preparation, 2) transaction, and 3) integration. The two first are decision phases and occur before the deal is signed. The third phase is an implementation phase in which plans are carried out. During the idea phase potential targets are suggested and evaluated. The deal is thereafter justified to the rest of the corporation before it can go through. After the deal is a fact, the integration phase starts with a special stage-setting phase, a transition phase before the deal is accepted. Research should, according to Haspeslagh and Jemison, focus on the processes within these phases to

better understand how M&As actually work and how it is possible to use them for strategic purposes. However, the boundaries between the phases described by Haspeslagh and Jemison are somewhat fuzzy; many processes seem to be active in more than one phase.

By focusing on the negotiations taking place during the M&A process, Aiello and Watkins (2001) distinguish five distinct phases. The model regards M&A from a management perspective and the authors make recommendations on how to act and what is critical to keep in mind during the different phases. The first phase, Screening potential targets, is aimed at identifying all potential deals on the market. The second phase, Reaching initial agreement, is concerned with the identification of critical factors for the success of the deal. The third phase, Due diligence, is aimed at identifying problems within the potential target that could demonstrate themselves during the integration phase. The settlement of the deal is included in the fourth phase, Setting final terms and the last phase, Achieving closure, is directed towards leverage of expected benefits. As said before, this model apparently uses a fundamentally different perspective than the one suggested by Haspeslagh and Jemison (1991). It is used prescriptively to recommend action on processes that the manager may have an impact on, rather than descriptively, to identify and understand how events and processes relate to each other.

Buono and Bowditch's (1989) phase model distinguish seven combination phases: Precombination, Combination planning, Announced combination, Initial combination, Formal combination, Combination aftermatch and Psychological combination. The focus on combination indicates that there are dialectical processes (Van de Ven and Poole, 1995) within the phases, but seen as a whole, the M&A process follows the normal life-cycle pattern. Buono and Bowditch (1989) found that decisions were in each phase affected by ambiguities and uncertainties in the environment, but the ambiguities and uncertainties were more or less outstanding in different phases.

The three phase-models presented above are not the only ones available. Gartner Group defines six straightforward phases of an M&A, namely Strategy, Planning, Evaluation, Acquisition, Integration, and Operation (Breindenbach, 2000). Graves (1981) identified four stages: Planning stage, Anxiety phase, The merger itself, and the Evaluation stage. Different models are results of different focal points and different perspectives, thus contributing with new information on

the issue. How the models relate to each other will be more profoundly addressed in the following section.

3.4.2 An integrated view of phase-models

Figure 3.5 is an effort to compare how the different model phases relate to each other. An apparent common characteristic is the focus on pre-M&A activity, where the models have the greatest number of phases. Phase-models that are more elaborate on the post-M&A side, with more detailed descriptions of post-M&A processes, do exist. However, in general, they focus on only the post-merger issues. These specific integration models are addressed in section 3.4.3.

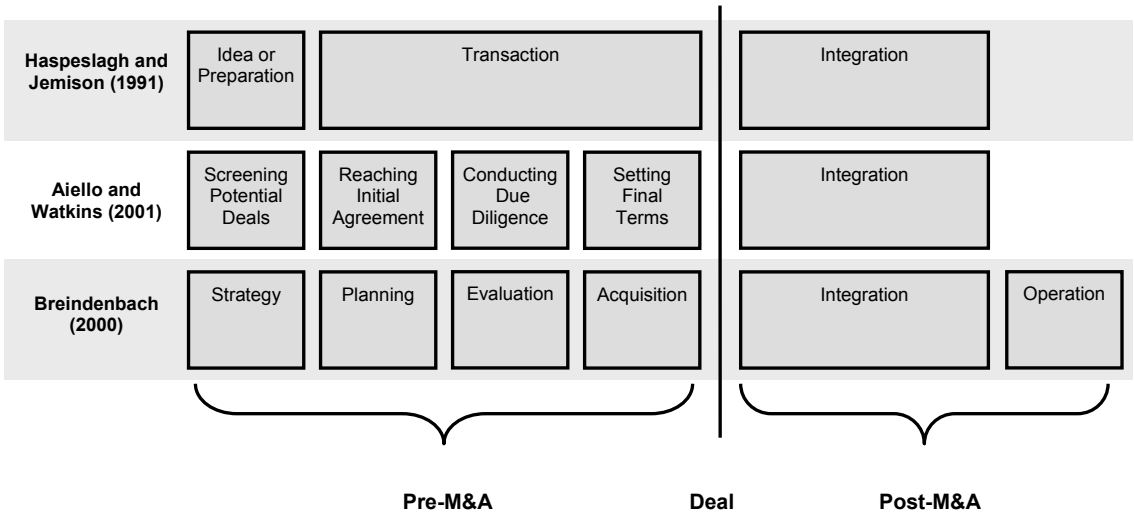


Figure 3.5 An integrated view on M&A phase models

The rationale for using phase models has been to distinguish different events and activities of each stage, thereby furthering the understanding of the M&A process and how it can be managed (Risberg, 2003). However, the above reviewed models do have imprecisely established boundaries. It is hard to say where one phase ends and another begins, a discovery that Risberg (2003) also made in her phase model review. Risberg furthermore noticed that different perspectives can lead to different processes identified:

> Different parts of the organisation and different individuals can experience different phases at the same time. Therefore it is difficult to talk in terms of the whole organisation being in this phase or that phase. One can also question whether phases really are sequential. Maybe some parts of the organisation experience a sequence of phases different from those described by researchers; some may skip one phase or enter a later phase before an early phase. Lohrum (1992) made an observation that people at different hierarchical levels experience different integration phases. For example, blue-collar workers only experienced two integration phases–when representatives from the acquiring company worked in the company and when they had left. (Risberg, 2003, p. 4)

A conclusion of the reviewed models is that pre-merger activities do focus on determining whether strategic and organizational fits exist; whether a rational strategic purpose determined by potential synergies exists, and whether the two corporations' organizational attributes have potential for a successful combination. Pre-M&A process theory recognizes that these could be difficult stages to overcome. Post-M&A process models, on the other hand, emphasize that, although the prerequisites evidently play an important role, there are better and worse ways of conducting the integration. Whereas pre-M&A issues have been addressed quite extensively in this and the two earlier sections of this chapter (M&As as a strategic tool and organizational fit), not much has been said about post-M&A activity. According to the reviewed models, post-M&A issues can be addressed in terms of organizational integration, which is the topic of the next section in this review.

3.4.3 Post-M&A Integration

Although not demonstrated in the M&A phase models presented above, integration is highly emphasized in M&A research. "Integration is the key to making acquisitions work. Not until the two firms come together and begin to work toward the acquisition's purpose can value be created" (Haspeslagh and Jemison, 1991, p. 105). The primary objective of the integration work is to make more effective use of existing capabilities (Datta, 1991). Researchers have increasingly begun to focus on factors influencing the management of post-M&A relationships as potentially critical in acquisition success or failure (Pablo, 1994). Failure is also often attributed to the many difficulties of

integrating the target firm with the acquirer (e.g. Kitching, 1973; Parenteau & Weston, 2003; Ranft & Lord, 2002; Weber & Schweiger, 1992; Datta, 1991; Larsson, 1990; Pablo, 1994).

Logically, for two units to be able to generate more economic value together than apart, the units have to be integrated in some way. Potential sources of economic value were described earlier in this chapter. Roughly, the value creation sources could be clustered into technical, pecuniary, and diversification economies. For these potentials to actually be realized, some kind of integration is needed. The type of integration needed is dependent on the economic source. For example, to achieve a monopoly requires that a company sales functions for different products do not compete with each other.

Organizational integration can be discussed in terms of integration levels. According to Shrivastava (1986), integration can take place on three levels: procedural, physical, and managerial/sociocultural. The first level, the procedural, is where the objective of the integration is to homogenize and standardize work procedures at operating, management control, and strategic planning levels. One of the more basic integrations on this level is the combination of accounting systems, creating one legal unit. The second level is physical integration, where product lines and production technologies are integrated. Referring to the strategic purpose of M&A described earlier in this review, this type of integration is foremost related to horizontal and, to some extent, to vertical M&A, but not so prominent in M&A by other strategies. The first level is equally salient in all types of M&A, a condition that seems to be true also for the third level in Shrivastava's taxonomy, managerial and sociocultural integration. On this level, integration is about merging corporate cultures and managerial viewpoints. Concretely, top managers, middle managers and staff personnel are transferred between the two corporations - especially from the acquiring to the acquired, if the M&A is an acquisition. The transfer could help to create a common understanding of the merged entity's norms, values and decision making procedures, but the transfer of key managers will not alone ensure cultural integration (Shrivastava, 1986).

Lohrum (1992) is another of the researchers that have tried to model the integration process. She found that all integration processes started with an observation phase, where the two parties observed each other and the setting. During the second phase management elaborated

integration plans, plans that were executed during the third phase. In this phase formal and structural changes were implemented, but human and cultural integration did not begin before this phase was concluded. Thus, during the fourth phase, consolidation, the real sociocultural integration started. The integration process ended in a maturity phase when corporate structure and culture had been blended.

3.4.4 Human reactions on the integration process

In the summary of Shravista's (1986) integration levels above, cultural integration and people transfer were emphasized as being part of the third level of integration. These issues have mostly been emphasized in terms of organizational fit, as described earlier. Studies by Cartwright and Cooper (1992; 1993a; 1993b) support this view. They found post-merger acculturation to be largely predetermined by pre-merger cultural attributes and therefore outside management's control during the integration process. On the other hand, Larsson (1990) and Larsson and Lubatkin (2001) argue that how employees act on M&A has little to do with the organizational prerequisites when a M&A decision is being made, but more on how the integration process itself is managed.

> We find that achieving acculturation depends mainly upon how the buying firm manages the informal integration process (i.e. its reliance on 'social controls,' or the amount of coordination and socialization efforts expended by the buying firm). Further, this finding is robust: it held regardless of the expectations of synergies (merger relatedness), relative organizational size and differences in nationalities and culture. Finally, a post hoc analysis of an integration control typology suggests that social controls also seem to also have an indirect and positive influence on acculturation, by acting in concert with formal integrative efforts (autonomy removal). (Larsson and Lubatkin, 2001, p. 1575)

According to Haspeslagh and Jemison (1991), employees of corporations are often told that no changes are expected because of the M&A, but this message is normally distrusted by employees. The intention behind announcing status quo is to avoid worries and anxiety among the staff, but the effect is often the opposite (Risberg, 2003). As employees often expect changes, such declarations may lead to employees believing that the management has something to hide (Buono and Bowditch, 1989). Schweiger et al. (1987) studied the

reactions of employees in acquired companies and found five major personal reactions steaming from the acquisition. Employees experienced a loss of identity when they no longer could identify themselves with the company. Lack of information was something that almost all employees in the study mentioned. Survival becomes an obsession for many people that spend more time protecting themselves and their positions from changes or worrying about their personal futures than doing their work. As a result of uncertainty and changes, both factual and anticipated, people left the organization. Schweiger et al. (1987) found that not much attention was paid to the concerns of the employees. The top management in some companies tended to be so caught up with their own situation, in combination with faced ambiguity and uncertainty regarding the future, that they not always understood what actions needed to be taken.

Just as a number of different typologies have been developed to distinguish between different kinds of M&A, an equally large number of typologies focusing on M&A integration exist. Related to the view of people's reaction being an essential part of any M&A integration process, Pritchet (1985) identified a continuum based on the two corporations' approaches to the merger or acquisition. One extreme of the continuum is labeled "Friendly" and the other extreme is labeled "Hostile" (Figure 3.6).

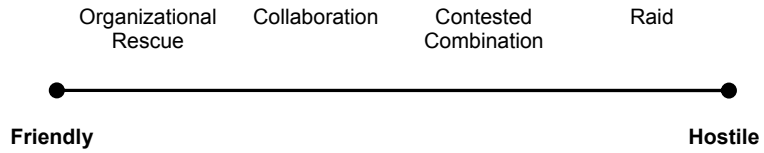


Figure 3.6 Friendliness - Hostility Continuum. Adapted from Buono and Bowditch (1989), based on Pritchett (1985).

The friendliest form of acquisition is the Organizational rescue. The two basic types include 1) financial salvage, and 2) rescue from a hostile takeover (Buono and Bowditch, 1989). Generally, this type of M&A is well perceived by the target. Nevertheless, this type may also face some problems. A financial salvage is the result of the acquired company not doing very well financially and a normal consequence is that many managers are replaced and the organization is restructured, leading to uncertainty for the employees. The next degree of M&A friendliness is

a collaboration. This is bynature more of a neutral merger than an acquisition. The objective is to reach a fair deal for both companies, but some of the problems that arise are related to the way in which the combination is communicated to personnel and the inability to follow up on hasty promises (Buono and Bowditch, 1989). In contested combinations only one of the companies wants the deal, or the companies would prefer completely different arrangements (Buono and Bowditch, 1989). In this scenario, some of the main problems involve a high level of hostility, adversarial interactions between the companies, and profound opposition during the integration stage (Buono and Bowditch, 1989). Finally, raids are the most hostile type of M&As (Buono and Bowditch, 1989). During raids, one company takes over another by bypassing management and directly asking shareholders to sell their shares (Buono and Bowditch, 1989). The problem raids include dealing with the highest level of employee resistance and the greatest amount of uncertainty for the target company (Buono and Bowditch, 1989).

3.5 Contribution of Chapter 3

Chapter 3 has treated the three strands of M&A research: strategic fit, organizational fit, and the M&A process. These three perspectives highlight that the potential of an M&A can come both from internal synergies, derived from the fact that the two combining units can be run more efficiently and/or effectively together than apart, but also from how the new unit positions in relation to its context. M&As can potentially alter the conditions for business within an industry to be more attractive or to change the relation between a business unit and its competitors, suppliers, and customers.

Chapter 1 highlighted that this thesis has an internal focus, since it is primarily the M&A benefits that stem from within the company that are dependent on organizational and IS integration. Based on the internal focus, the different views of the M&A process, as depicted in this chapter, can be combined into an integrative model that relates the initial combination potential to its realization into performance through the integration phase (Figure 3.7). The figure graphically displays how the key concepts of M&A as identified in Chapter 3 relate to each other. In this model, the M&A type is decisive for sources of

potential synergies, and the leverage of positive synergies of combining company X with company Y is inhibited by dysfunctions and barriers, stemming from lack of organizational fit or failures in the management of the M&A process. The combination potential is defined as "the combination of strategic and organizational fit at the closure of the deal, time = 0". Strategic fit determines which degree of integration is needed, and organizational fit sets the premises for it being reached. These are the preconditions. However, the actual leveraging of synergies is not only dependent on the precondition but also on how the post-M&A integration process is managed.

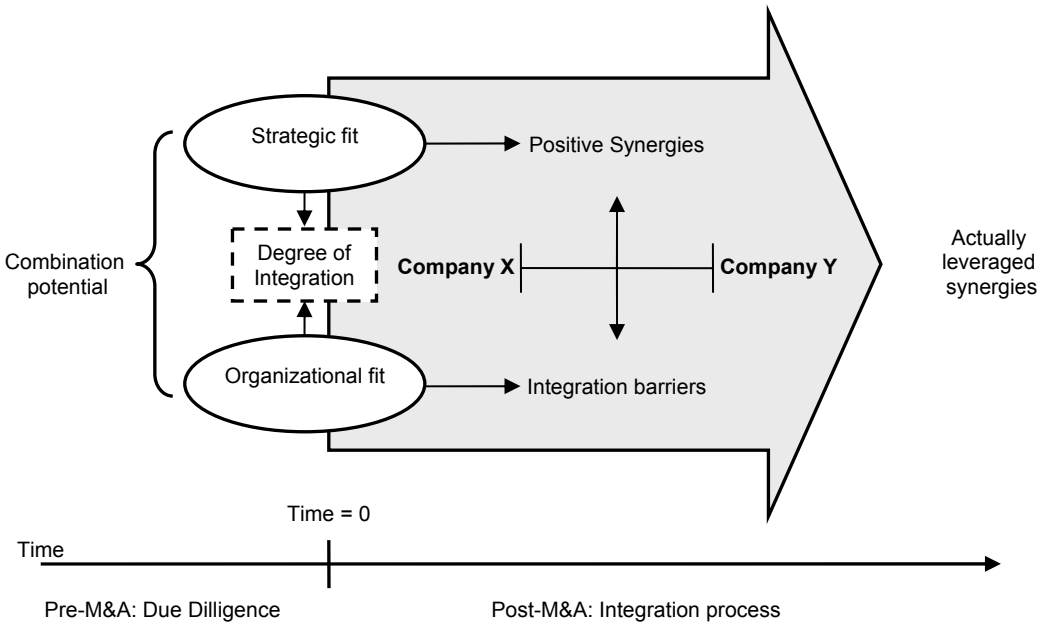


Figure 3.7 An integrative model for the M&A literature.

This chapter has presented theories that seek to explain key aspects of M&A. An aspect to consider in the later parts of this thesis is the complementarity of the three strands, how they explain different aspects of getting from an initially promising setup to a final outcome of realized synergies. Based on what has been presented in this chapter, a full account of the relation between IS integration and the general M&A process must incorporate: a) the synergetic potential, b) attributes of the desired organizational integration, and c) the general integration process as context of the IS integration. Table 3.2 summarizes the key concepts in the three areas and Table 3.3

summarizes relations among the key concepts which are graphically presented in Figure 3.8.

Table 3.2 Classification concepts in Chapter 3

Key concept	*Description*	*Classification*	*Indicative references*
Synergetic Potential			
Technical economies	Scale economies that occur when the physical processes inside the firm are altered so that the same amounts of inputs produce a higher quantity of output, or the same quantity of output is produced using fever resources.	Marketing, Production, Experience, Scheduling, Banking, Compensation	(Howell, 1970; Shepherd, 1979)
Pecuniary economies	Correspond to the firm's capability to dictate market prices by making use of market power achieved primarily by size.	Monopoly, Monopsy	(Porter, 1980; Shepherd, 1979)
Diversification economies	Diversification economies are achieved by improving the firm's performance relative to its risk attributes, meaning to spread risk among unrelated markets and products through a strategic product portfolio	Portfolio management, Risk reduction	(Higgens & Schall, 1975; Lewellen, 1971)
Organizational Integration			
Degree of integration	The aspired level of integration is not always complete absorption, but can rather be of different degrees	Holding, Preservation, Symbiosis, Absorption	(Haspeslagh & Jemison, 1991)
Intentions & Reactions			
Friendliness/Hostility	The continuum depicts different levels of "hostility" based on the acquired units state before the M&A and the purpose of the takeover.	Rescue, Collaboration, Combination, Takeover	(Pritchett, 1985)
Reaction	Humans are considered key components of modern organization and an M&A can trigger extensive resistance and employee turnover	Turnover rate, Level of distrust	(Napier, 1989; Buono & Bowditch, 1989)
Phase-models	Phase models of 2-8 phases depict a pre-M&A phase where organizations are preparing and planning for the act. After the deal is closed, the work of making the two units function together begins.	pre-M&A, post-M&A	(Aiello & Watkins, 2000; Haspeslagh & Jemison, 1991)

The synergetic potential was suitably summarized by Lubatkin (1988) into technical, pecuniary, and diversification economies. Based on the expected synergies, different degrees of integration were needed. The scale ranges from holding, via preservation and symbiosis to complete absorption (Haspeslagh & Jemison, 1991). Not only are the resources needed to achieve the required degree of integration dependent on the type of relation (see Chapter 2; pooled, sequential, reciprocal), but in

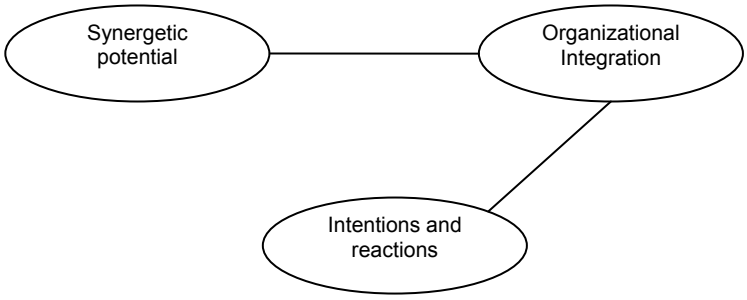


Figure 3.8 Relations between key constructs in Chapter 3

international M&As, cultural differences frequently act as barriers to integration. Finally, three concepts that focus on the M&A process have been discussed. Prior research has variously differentiated the M&A process into different phases. Although several phase models exist dividing the process into 3, 4, 5, 6, 7, and even 8 phases, they build on much the same logical progression and basic structure of one pre- and one post-M&A part. The relation between the two companies previous to the M&A has shown great significance for the final outcome. Whether the deal is a hostile takeover, contested combination, collaboration, or also possibly an organizational rescue is correlated to the way people react to the initiative.

Table 3.3 Relational concepts in Chapter 3

Relation	*Concept*	*Description*	*Indicative references*
Synergetic potential – Organizational integration			
	Integration mode	The degree and mode of integration should be dependent on synergies expected as higher levels of integration are resource demanding. In chapter three it was explained how different kinds of synergies were leveraged by different levels of integration. Leveraging monopoly synergies do not demand integration to the same extent as production or scheduling synergies.	(Haspeslagh & Jemison, 1991)
Organizational integration – Intention and reactions			
	Resistance	Resistance among employees may cause integration problems. Giving it a thought, it makes a lot of sense. If one strives for higher degrees of integration, it is not a good idea to have workforce opposing you. What Buono and Bowditch contributed was insight that helps understand when and why people are opposing the integration in order to avoid such situations.	(Buono & Bowditch, 1989)

Chapter 2 gave an account for key concepts in the first theoretical fundament of this study – IS and IS integration. This third chapter has introduced the second theoretical fundament, theories of M&A. Thus far the fields have been pursued largely in isolation from each other. The next, Chapter 4, will focus on research on the intersection of the two fields: IS integration in M&A.

Part II:

Describing and explaining IS integration in M&A at Trelleborg

4. IS Integration and M&A

This chapter is structured in the following way. First, the 24 identified works that deal with IS integration in M&A are introduced. The progress of the field is described in terms of the addressed question and "classic" works. In order to present more conceivably what is known regarding the relationship between IS integration and M&A, the remainder of the chapter is structured according to the three strands of M&A research that were also used to structure the last chapter. As the three strands are argued to represent research on M&A, relating them to existing IS literature should fulfill the objective of this chapter: to present what is already known about the relationship between IS integration and M&A.

4.1 Research on IS integration in M&A

The role of IS in M&A has mostly been highlighted in anecdotes provided by the business press, explaining how M&A fails to produce economic value because of difficulties in integrating the IS (McKiernan & Merali, 1995). Scientific research has been scarce, and theory and model construction almost non-existent (McKiernan & Merali, 1995; Robbins & Stylianou, 1999; Mehta & Hirschheim, 2004). This chapter presents the writings that specifically have addressed the topic of IS integration in M&A. Together they present a fragmented collection of models and tentative theories that cover distinct pieces of the subject matter. In order to reinforce the limited understanding, the general IS integration and M&A literature as presented in Chapters 2 and 3 are elaborated upon. By combining the existing theory within the two fields, preliminary conclusions on the relationship between IS integration and M&A can be drawn deductively.

IS integration in M&A is a relatively sparsely researched topic, addressed by a limited number of publications. For a mature topic, an appropriate objective for a literature review would be a synthesized conceptual model. For a novel and sparsely researched topic, the

objective would be to introduce the theoretical fields that may be used to shed light on the phenomena (Webster & Watson, 2002). IS integration in M&A is not a completely novel subject, nor a mature subject which is possible to be synthesized into a conceptual model. The objective of the literature review was primarily to identify the thematic fields that have been used to make sense of IS integration, M&A and the combined subject of IS integration in M&A.

Chapter 1 indicated that this thesis has its core focus on an important empirical phenomenon and through a comprehensive theoretical account tries to make sense of the phenomenon. The approach should be contrasted with taking one or several theoretical perspectives as a starting point and by empirical input, verifying or modifying that theory. The approach of using a real world problem as a starting point was argued to be essential to assure the relevance for practice, but complicates the research process by, among others, additional requirements on the literature review. The research cannot only report the work that has been done under a specific label, but has to aspire to cover *all* research that contributes to the accumulated knowledge of the phenomena (Pawson & Tilley, 1997).

IS integration in M&A and its logically constituent parts, IS integration and M&A, are phenomena that have been described under a plethora of different concepts (see Chapters 2 and 3). The search for previous literature that addresses IS integration in M&A could not, with the above described ambition, give a comprehensive account for what is already known about the phenomenon explicitly on IS integration and/or M&A. The search also included related topics such as integration of IT-systems, ERP-integration, ES, EAI, EDI, ESD (see Chapter 2). The field of M&A is more mature and has found a common label in the combined topic of M&A. However, the search also had to be extended with the individual labels of "merger" and "acquisitions," since for some reason unknown to the author, researchers on integration in M&A tend to label their work "post-merger integration" (e.g. Robbins & Stylianou, 1999; Alaranta, 2005a; Wijnhoven et al., 2006) or "post-acquisition integration" (e.g. Datta, 1991; Fowler & Schmidt, 1989).

The literature search mainly followed Webster and Watson's recommendations on how to systematically identify relevant works in leading journals through article databases (which included ProQuest, JStor, and Elesevier among others) and to scan tables of contents for

works not matching the keyword search. Further works were identified through an iterative use of citations and the Web of Science3 (the electronic version of the Social Sciences Citation Index). However, only a very limited number of articles on IS integration in M&A have appeared in the leading journals. To complement the identified works, a more creative search was ongoing during the whole research process. This hunt included searches in Google and Google Scholar, browsing less well-reputed journals and conference proceedings of conferences where relevant publications could have been presented. Additional important sources, to ensure that this thesis is built upon the accumulated knowledge on IS integration in M&A, have been the participation and feedback from IS conferences throughout the research process and the cooperation of fellow researchers interested in IS integration in M&A. Exchanging EndNote-libraires should not be underestimated as a method of finding relevant publications.

In total, 24 publications of different kinds that specifically addressed the topic of IS integration in M&A were found. Some articles have been published a number of times with more or less extensive variations in content. Articles that basically present the same research findings are grouped together and presented as one publication. These publications are listed by date of publication in Appendix A. The writings are divided into two generations: a first generation of pioneering explorative studies of ad-hoc character, and a second generation with more long term focus, based on frameworks and conceptual models. As IS integration in general, and in the context of M&A in particular, has received increased attention during the last few years, a number of publications have been presented since the start of this research project in 2004. These publications were naturally not considered in the first tentative stages of the study, but have been integrated into the theoretical foundation as they were made public. However, the preliminary theoretical framework used in the first case studies was understandably based on the publications existing at that time. In order to be able to distinguish that preliminary theoretical baseline, the later contributions are presented separately.

4.1.1 First generation of works on IS integration in M&A

The earliest article that is referred to by publications on IS in M&A was authored by Buck-Lew, Wardle and Pliskin and published by

Information & Management in 1992. The authors address IS as another organizational attribute that needs to be matched in the comparison of organizational fit.

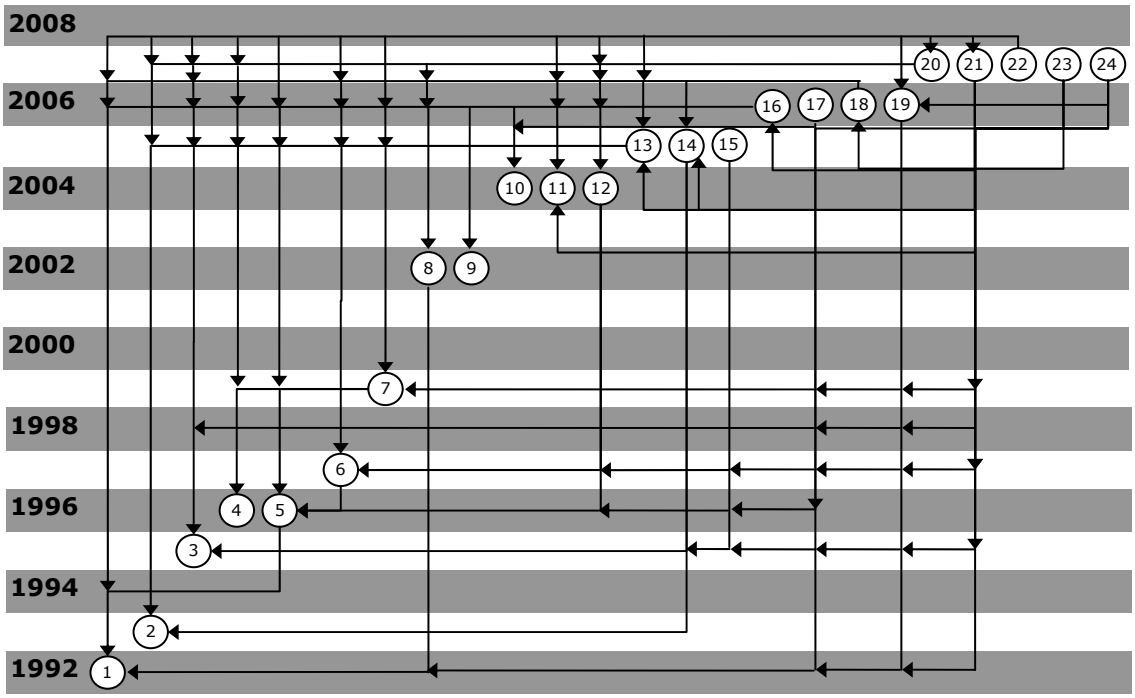
> Since company data and information technology (IT) are as much a management resource as the financial and human resources for the combined firm, the proposal is made that IT fit should be explicitly considered in analysis of corporate acquisitions. (Buck-Lew et al., 1992, p. 363)

However, this article is only occasionally mentioned, normally the earliest referred articles are two works by Merali and McKiernan (1995; 1993) in which they address the integration of information systems after mergers from a strategic perspective. McKiernan and Merali (1995) argue that currently IS integration is a post-M&A issue, dealt with reactively. It should, however, be an early issue on the agenda and be used proactively to maximize chances for positive outcome. The same was later suggested by Weber and Pliskin (1996). In their study they investigated the relation between investments in IS integration and a company's effectiveness. Also in 1996, Stylianou et al. addressed IS as a potential reason for failure in M&A, an approach that ended in a model of factors that influenced IS integration success and a conceptualization of the 'success'-notion.

The five above mentioned articles can be said to constitute a first generation of scientific work on IS and M&A. As depicted in Figure 4.1, these articles do not hold any references to each other. By nature, they are explorative and driven by a desire to capture an empirical phenomenon of growing importance. The existence of these articles is logical in the light of the fourth worldwide M&A wave that swept over the world in the late 1980's and the increasing importance of IT in business.

4.1.2 Second generation of works on IS integration in M&A

For almost a century, the phenomenon of M&A has been coming and going. Four major waves of increased activity have swept over the world, but after the latest peak in the late 1990's something happened to the pattern. Activity did decline, but not to the same extent as before. Rather, activity settled at a fairly stable level with the act of



1. (Buck-Lew et al., 1992)
2. (Merali & McKiernan, 1993)
3. (McKiernan & Merali, 1995)
4. (Stylianou et al., 1996)
5. (Weber & Pliskin, 1996)
6. (Giacomazzi et al., 1997)
7. (Robbins & Stylianou, 1999)
8. (Chandra & Kumar, 2001)
9. (Gurjar et al., 2002)
10. (Alaranta & Parvinen, 2004)
11. (Hwang 2004)
12. (Mehta & Hirschheim, 2004)
13. (Alaranta, 2005a)
14. (Alaranta, 2005c)
15. (Henningsson, 2005b)
16. (Henningsson, 2006b)
17. (Brunetto, 2006)
18. (Henningsson & Carlsson, 2006a)
19. (Wijnhoven et al., 2006)
20. (Alaranta & Henningsson, 2007)
21. (Henningsson, 2007)
22. (Henningsson & Carlsson, 2007)
23. (Henningsson et al., 2007)
24. (Mehta & Hirschheim, 2007)

Figure 4.1 Internal citations of publications on IS and M&A

M&A as a prominent tool for corporate strategy (Sirower, 2003). It is thus natural that research on IS' relationship to M&A appears to have become more popular during recent years. As a number of Ph.D. students worldwide are trying to get a firm grip on the issue, literature reviews and frameworks are logical outputs. Baro (2004) has created a "State of Art-paper" as foundation for her research on the role of IS/T executives in M&A. French Ph.D. student, Gérald Brunetto, focuses on IS integration after mergers from a functionalist and constructivist perspective (Brunetto, 2002; Brunetto, 2006). A framework for studying IT integration decisions in M&A ended up in a conference

paper (Mehta & Hirschheim, 2004). Other frameworks on which studies could be based upon have been directed towards measurements and factors for IS integration success (Chandra & Kumar, 2001) and the impact of IS implementations on vertical M&A (Gurjar et al., 2002). Finally, Hwang (2004) contributed with a paper on prior research related to integration of enterprise systems in M&A.

In addition to the research frameworks, the second generation of articles also includes empirical work that builds on the first generation's explorative findings and classification of the phenomenon. As the empirical phenomenon still remains quite unexplored, a common approach is to extend potentially relevant theories from related phenomena, and validate the extension with a study. For example, Alaranta (2005) applies Motwani et al.'s (2002) Framework for ERP Implementation to understand what is influencing the success of an ERP implementation to solve the integration need after an M&A. Similarly, Giacomazzi et al. (1997) draw on organizational integration theory to create normative prepositions for IS integration. Alaranta and Parvinen (2004) reviewed the contribution of governance theories of the firm to the analysis of post-M&A IS integration.

An example of how the second generation draws on the explorative findings in the first generation is given by Robbins and Stylianou (1999). The above described model by Stylianou et al. (1996) was revised in 1999 by two if its creators, using the same empirical material. It is also noteworthy that the earlier mentioned conference paper by Kumar et al. (2002) is based on the IS integration success models by Stylianou et al. (1996) and Robbins and Stylianou (1999). Kumar et al. claim to add a process view to the model, however, the process view is only adopted in the construction to measure IS integration success. The rest of the model is not enhanced with a process perspective, but comprises the same structure.

4.1.3 Later contributions (2005-2007)

As much as half of the identified contributions originate from the last few years with more intense focus on IS integration and the particular case of IS integration in M&A. By the pragmatic reason that the publications between 2005 and 2007 (numbers 13-24 in the presentation above) did not exist when the first version of the theoretical framework was created at the end of 2004, they were not

considered at that point. Instead, they have been integrated as they emerged, suggesting additional direction on where to dig for new empirical data and providing means for analyzing and drawing tentative conclusions. The objective of this chapter is to provide an account for research within the intersection of IS and M&A. These later contributions are included in this account for the reason that they represent an extensive part of the research conducted within the field.

The contributions since 2005 are characterized by much the same properties as described above as being typical for the second generation of IS integration in M&A publications. The empirical studies have become more comprehensive. Maria Alaranta did two in-depth case studies for her dissertation work which in 2005 resulted in three articles (2005c; 2005a; 2005b). Alaranta tells the story of two manufacturing companies that merged their production facilities and strove to integrate them through IS integration. Alaranta (2005c) applies Motwani et al.'s (2002) Framework for ERP Implementation to understand what is influencing the success of an ERP implementation to solve the integration need after an M&A. She concludes:

> Besides change management, issues relevant to successful post-merger ES integration include: M&A factors, factors related to company expertise & resources and factors related to software & vendor. Furthermore, an important notion is that different units may require different managerial approaches or different amounts of resources because of the possible differences in there IS capacities and readiness to change. (Alaranta, 2005c, p. 1)

In another article (Alaranta, 2005a), based on the same empirical material, she addresses the question of IS integration success. The contribution here is a four dimensional conceptualization of IS integration success: User satisfaction of the integrated software's system and information quality as well as its use, Efficient and effective IS integration management, Efficient IS staff integration, and IS ability to support for the underlying motives of the merger.

Alaranta has also co-authored a comparative article based on one acquisition within the telecom industry and one in the manufacturing industry. The case from the manufacturing industry is the first case presented in the next chapter, thus will be returned to later in this thesis. As mentioned in chapter 1, parts of this thesis have been

published in various versions. For a more elaborated presentation of these publications, please return to section 1.7

Two interesting contributions with recent dates of publications focus alignment of IT strategy and overall M&A strategy (Wijnhoven et al., 2006; Mehta & Hirschheim, 2007). Wijnhoven et al. base their IT alignment model on the alignment framework of Henderson and Venkatraman (1992). They identify three ambition levels of M&As and IT integration from the literature. Additionally, they describe four integration methods that fit with these ambitions. The relations between these objectives and methods are moderated by contextual factors. Mehta & Hirschheim assume a slightly different approach, arguing that the proposed model for IT alignment have shortcomings in that it does not cover the completed integration process and does not include sourcing as a strategic decision. Instead, the framework for IT alignment proposed by Hirschheim and Sabherwal (2001), showed the firms to be somewhat misaligned in the early post-M&A period, and to come into alignment only two to three years after the deal was finalized. An additional finding was that business-IS alignment was a minor concern for the new organizations in pre-M&A and early post-merger phases. Other factors, such as acquirer-target power struggles, prior merger experience, and overarching synergy goals, drove much of the initial integration decision making. Only late in the post-merger do the merged organizations revisit their systems to bring them into alignment with the business needs.

The assumption is that alignment leads to better organizational performance and that it is desirable that decisions regarding IS integration match the overall acquisition strategy. Such a point of view has limitations in that corporate strategies do not tend to be formalized plans that are elaborated upon at top level management and then implemented company-wide in a straightforward process. Rather, strategy often grows from bottom up, in an incremental manner, thus making it difficult to define a strategy other than in retrospection (Mintzberg, 1994; Quinn, 1978). Achieving the desired level of integration may take several years during which the overall strategy may be subject to changes and sometimes cannot be regarded as a stable point of reference to which IS integration decisions can be aligned (Alaranta & Henningsson, 2007).

4.2 Combining literature on M&A and IS integration

The phenomenon of M&A has been around for almost a century now, while IS integration first became a topical issue in the 70's. It is therefore not strange that the field of M&A has reached a higher degree of maturity where it is easier to spot recurring research themes and abstract contributions to specific strands in M&A than in IS integration. It is by this logic that the abstraction of the M&A field is used to structure this section. By using the three strands and relating them to IS integration research, it is believed that the presentation of what is known on the relationship between IS integration and M&A will be communicated more effectively than it would be the other way around.

4.2.1 M&A as a strategic tool and IS integration

Regarding strategic fit from an IS integration perspective, it is possible to imagine some aspects where IS could make a difference. Lubatkin (1983) argues that there are significant differences between mergers and mergers. From an IS perspective, there are reasons to believe that he is right. The different kinds of M&A identified in the FTC framework pose different requirements on IS integration. For example, in vertical mergers the main synergies are scheduling economies where integration is made either backwards or forwards. The IS requirement is thus to create a reliable solution with real-time linkage between the prior independent IS. In horizontal M&As, the objective may be to create one organizational unit from many units, which logically pose a different set of requirements on the future IS and the IS integration process. This could be compared to the conglomerate M&A, where organizations remain independent units and therefore do not rely as heavily on IS integration. Giacomazzi et al. (1997) have studied how the strategic purpose affects the role of IS. They propose a decision support model based on a differentiated view of M&A. Based on the strategic intent, they suggest that the desired IS integration should not always be total integration, but could also be partial or even nonexistent.

Giacomazzi et al. (1997) indirectly address the question of IS' role in the leverage of different kinds of synergy. Diversification economies

lead to conglomerates which do not require any integration. Neither does pecuniary economies in themselves, but M&As related to pecuniary economies, logically also involve potential technical economies. As pecuniary economies are related to size, and negotiation power towards customers and suppliers, they involve organizational growth which is related to economies of scale (a technical economy). No research, as far as the author has been able to identify, has specifically treated the relation of synergy and IS.

The essential of combing RBV and the M&A act is the combination of resources to achieve sustained competitive advantage. It has been concluded (Clemons & Row, 1991) that IT can only lead to sustained competitive advantage in combination with other resources. The technology itself can more or less easily be copied by another organization, sustained competitive advantage lies in the use of the technology and the capability to cope with the technology from a managerial point of view (Mata et al., 1995).

Another potential reason for undertaking an acquisition is the objective of acquiring certain competences or resources of another organization. It may be knowledge of a market, a stock of customers, production facilities or – IS. Relevant contributions on this topic are not directly related to the M&A literature, but to a more general debate on the strategic use of IS. In a Harvard Business Review article, Carr (2003) argues that IT has no strategic role in modern companies, comparing it to the use of electricity. However, in a recent debate on the nature of IS and IS research, the view was put forward that "an information system is specific to the organizational (or inter-organizational) context in which it is implemented" (Iivari, 2007 p. 571). Adopting this view, one might question the possibility of acquiring the IS as resource, however relevant related personnel skills regarding the IS may be considered to be.

The strategic process perspective has some ideas on how the IS integration is achieved. As argued above, the existing phase models hold true for the integration process being formal, rational and straightforward. This set of thinking is also transmitted to IS integration process research in the context of M&A. For example, McKiernan and Merali (1995) apparently make this assumption. Additionally, authors such as Giacomazzi et al (1997) and Stylianou et al (1996) make the same assumption. By contrast, general research on strategic IS planning explicitly emphasizes the possibility of strategic

decision processes being continuous with emerging solutions (Segars & Grover, 1999). Segars and Grover (1999) argue that appropriate levels of consistency are dependent on the rate of changes in the internal organizational environment and external competitive (c.f. Mintzberg, 1994). In discussing consistency, we would also stress Andreu and Ciborra's study from 1996 where they concluded that strategic IS needed to go through three cumulative phases where at least the third phase should not be able to be planned before the two preceding phases have been accomplished. Later Kalling (2003) confirmed the finding in the specific case of IS implementations. Consequently, the view is taken here of appropriate levels of consistency not only being dependent on the rate of changes in the internal organizational environment and external competitive, but also dependent on the nature of the strategic decision at hand.

4.2.2 Organizational integration and IS

Most of the research on organizational fit is relevant for IS integration. Humans are key components of IS, at least as it is defined in this study, and what is true for any personnel working at one of the involved organizations, should also be true for personnel related to the IS. Relating to the strategic purpose described earlier, if the M&A is of horizontal type and one organization is more powerful than another, it is likely that the dominating organization's IS will become the standard. Hence, competences and skills among the acquired company's personnel will be less valued and the situation of noneconomic value destruction is a fact. Research has shown that one important reason for the acquired company's personnel tending to leave the new organization in connection with or shortly after the acquisition is the difficulties of advancing the career in the new organization (Risberg, 1999). The IS may be addressed as one part of the general organizational integration. Thus, IS fit becomes a relevant topic to consider before any M&A (McKiernan & Merali, 1995).

Stylianou et al. (1996) adopt the logic of IS characters being a part of organizational fit and address IS as a potential reason for failure, an approach that ends in a model of factors that influence IS integration success factors. Influencing IS integration success was by the authors divided into four groups: organizational attributes, IS attributes, organizational management attributes, and IS management attributes

(Figure 4.2). The categories were said to be the result of a literature review; unfortunately, no further references were given. Together, the attributes were argued to be determinants for successful integration in M&As. IS integration success was presented as a multi-dimensional construct that could be expressed through four measurements:

- The ability to exploit opportunities arising from the merger
- The ability to avoid problems stemming from the merger
- The end user satisfaction with the integration process and integrated systems
- IS assessment of the success of the integration process and integrated systems

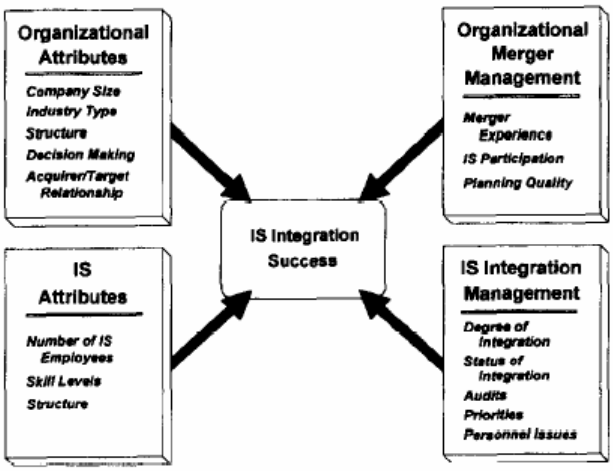


Figure 4.2 Influences on IS integration success (Stylianou et al, 1996, p. 205)

Stylianou et al.'s questionnaire-based survey of American CIOs' experiences targeted 23 attributes, divided between the four categories described above. 44 CIOs answered the survey, representing an 18 percent response rate. Conclusions were that prior merger experience, IS participation in merger planning, the quality of merger planning, the criteria used for setting IS integration priorities, and a high level of data sharing across applications appeared to have a positive influence (significance level 0,01) on the success of the IS integration. Changes that directly affected personnel had a significant negative impact, as did programming language incompatibilities. Most of the conclusions are

not new, confirmed to be valid not only for the M&A in general, but also for IS integration in particular. Regarding prior experience, several more comprehensive and more elaborated studies have been made (see section 3.2.3), some with the conclusion that prior experience is relevant, and some concluding the opposite. In general, the small sample in combination with a low response rate leads to belief that the conclusions offered by Stylianou et al. should be seen as inspiration for future research, rather than final, unchallengeable conclusions on which to build future research.

Robbins and Stylianou (1999) highlighted that the fourth measurement of IS integration success, IS assessment of the integration process and integrated system, could be biased and therefore should not be included as a measurement. Additionally, arguing that the existing model omitted significant measurements, they added two new:

- Improved IS capabilities that help support the underlying motives for the merger
- Efficiency and effectiveness of resource utilization during the integration process

The final model is presented in Figure 4.3. Influencing attributes are regrouped into two categories: organizational and IS factors. As the IS can be said to be a part of the organization, the model clearly can be sorted under the umbrella of models that focus organizational attributes as decisive for integration success.

4.2.3 IS considerations in the M&A process

The process perspective on M&A does not automatically exclude a strategic fit or organizational fit perspective (Risberg, 1999). Rather, to get from A to B, it is essential to understand what A and B is, that is, where the process starts and where it is supposed to end. Earlier phases of the integration process are closely related to determining organizational and strategic fit. These problems are also IS related. In the improvement of preconditions is included the task of creating an IS solution that is possible to integrate with other IS. As discussed in connection with the organizational fit perspective, questions also arise regarding the match of the two organizations' IS. Will it be possible to integrate, and which problems are likely to occur? After the deal is

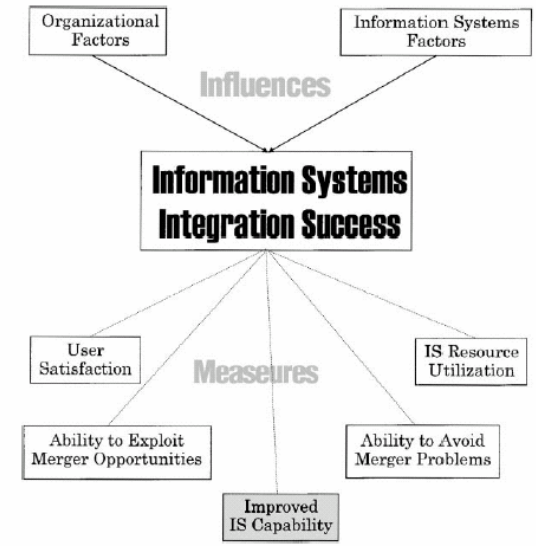


Figure 4.3 Influences and measures of information systems integration success (Robbins and Stylianou, 1999).

closed, the M&A process encounters problems with the activities of actually implementing the desired IS integration solution. All phases include problems related to the management of the IS integration process that may be addressed in different ways.

Just as IS fit could be regarded as one part of organizational fit, IS integration could be seen as one part of the organizational integration processes. IS integration takes place on all three integration levels, as discussed by Shrivastava (1986). Procedural integration is necessary to enable IT systems to communicate with each other – a customer must be defined and stored in the same way to enable interchange of data. Physical integration of IS is the hardware integration, and cultural and managerial integration are just as critical for the IS as for any other part of the organization. The major conclusion drawn from post-M&A integration research is that a recognition of the process perspective on IS integration, meaning recognition of the IS integration process itself and the way it is managed as contributing to the final outcome, is essential to understanding IS integration in M&As.

Often IS integration decisions are based on a perceived necessity and not driven by a wish to create competitive advantage. Clemons & Row (1991) discuss how some kind of IT investments are necessary instead of generating competitive advantage. To some extent, IS integration in M&As are of this nature, they are normally undertaken to support other business processes that need to be integrated to

leverage synergies. McKiernan and Merali (1995) studied the integration of IS after mergers from a strategic perspective. As said before, they concluded that IS could either be used proactively or reactively. Although IS normally was used reactively, meaning that IS integration was not an issue when considering mergers, IS staff was faced rather with the settled deal, and the authors argued in favor of proactively IS use. Drawing parallels to the M&A phase-models discussed above, McKiernan and Merali (1995) argue that currently IS integration is a post-M&A issue, dealt with reactively. However, it should be an early issue on the agenda, used proactively to maximize chances for positive outcome. The same was suggested by Weber and Pliskin (1996). In their study they investigated the relation between investments in IS integration and a company's effectiveness. Their findings pointed out a positive relationship when accounting for IT intensity and cultural differences in the integration process. In the cases where these two issues were not considered, no relation between IS investments and effectiveness was found.

McKiernan and Merali's (1995) conclusion that IS integration should be used proactively could be criticized, based on Clemons & Row (1991), Mata et al (1995) and Powell & Dent-Micallef (1997) who all argue that IS have limited possibilities to create competitive advantage, but instead should align to and support other organizational resources and thus logically follow subsequently to the shaping of the new integrated organization. However, according to McKiernan and Merali (1995), involving IS integration with due diligence could lead to IS integration enabled synergies being identified that would not have been discovered if due diligence had not been paid to IS integration.

4.3 Contribution of Chapter 4

In this chapter the existing research directed towards the relationship between IS and M&A was presented. Although the empirical and theoretical contribution is scarce, some interesting studies have been undertaken.

Table 4.1 summarizes the key concepts of chapter 4 that can be used for classifying an initiative of IS integration in M&A. The concepts are all related to the role of IS integration in the M&A process. Several authors put forward that IS integration should have a

more prominent role in the M&A process. Whether IS integration should remain in its current role as a reactive approach or, as suggested by (McKiernan & Merali, 1995; Weber & Pliskin, 1996), be used proactively as part of the due diligence phase, is still a important research issue. The discussion on proactivity is also nestled with the discourse regarding the importance of IS integration for the outcome of the M&A. Although stressed for far more than a decade by researchers, IS integration still plays a demure role.

Table 4.1 Classification concepts in Chapter 4

Key concept	*Description*	*Classification*	*Source references*
IS integration role			
Proactivity	It has been suggested that IS should be a part of pre-M&A due diligence and not, as currently, a post-M&A issue.	Proactive/Reactive use	(Merali & McKiernan, 1993)
Late contributions			
Alignment	Alignment has been proposed as the denominator for successful strategy. The IT strategy is supposed to be well aligned with the overall M&A strategy	Aligned, partly aligned, non-aligned	(Wijnhoven et al., 2006; Mehta & Hirschheim, 2007)
IS integration success	Alaranta propose that the concept of IS integration success could be subdivided into four categories.	User satisfaction, Efficient and effective IS integration management, Efficient IS staff integration, IS ability to motives of the merger	(Alaranta, 2005a)

Among the later contributions, two publications on the topic of IS alignment were identified (Wijnhoven et al., 2006; Mehta & Hirschheim, 2007). They point, to a large extent, to similar conceptualizations of alignment, even though they are based on different models. The difference is to be found in whether to include outsourcing and partnerships among the strategic decisions. The later contributions also include a conceptualization of IS integration success in M&A (Alaranta, 2005a), in which success is refined into User satisfaction, Efficient and effective IS integration management, Efficient IS staff integration, and IS ability to motives of the M&A.

Research has also highlighted relations between specific aspects of M&A and IS integration (see Table 4.2). The relations, graphically presented in Figure 4.4, are relations between Chapters 2 and 3 which

identified key concepts and the above introduced concept of IS integration role. Especially the matter of IS fit has been stressed. However, the empirical foundations for these conclusions are not sufficiently grounded to establish secure relations between IS characteristics and fit. Initial findings need to be tested further. When it comes to the process of IS integration, even less is known. However, it has been suggested that a reactive approach to IS integration is likely to have certain consequences on the decision of integration architecture. A reactive approach is more likely to transform existing systems, rather than replacing them, since the leverage of synergies following an M&A is normally under great time pressure.

Table 4.2 Relational concepts in Chapter 4

Relation	*Suggestion*	*Source references*
Synergetic potential – IS integration role		
	A proactive use of IS integration enables more accurate synergy estimation and possibly identification of supplementary synergies As IS integration is a risky and cumbersome process it is a issue that have to be considered early in the process. If not, cost related to IS integration can rapidly overshadow the benefits of the integration. McKiernan and Merali even argue that sometimes relative easiness in IS integration could even be a reason to make an M&A.	(McKiernan & Merali, 1995).
Organizational Integration – IS ecology		
	Stylianou et al. suggested that the IS fit as part of the organizational fit had significant impact on the resources needed for IS integration. Not only did they find that differences in the two companies' IS, for example programming language if internally developed, had a negative impact on resources needed. They also found that determining these differences and taking action upon the information prior to the M&A did have a positive impact, which further strengthens the evidence that IS fit is significant in M&A.	(Stylianou et al. 1996)
Integration architecture – IS integration role		
	A reactive approach is likely to transform existing system rather than replacing them. If the IS manager are approached with the issue to fulfill an integration need after the deal is closed the completion of the plans are often time critical as the pressure is high to recapture invested money.	(McKiernan & Merali, 1995)

Chapters 2 to 4 have presented the existing research on the topics of IS integration, M&A, and IS integration in an M&A context. The theories, models, and concepts accounted for indicate the collected knowledge on which the study is founded and to which it aspires to make a contribution. The collected knowledge is reused by its amalgation into a preliminary theoretical framework that, in turn, is

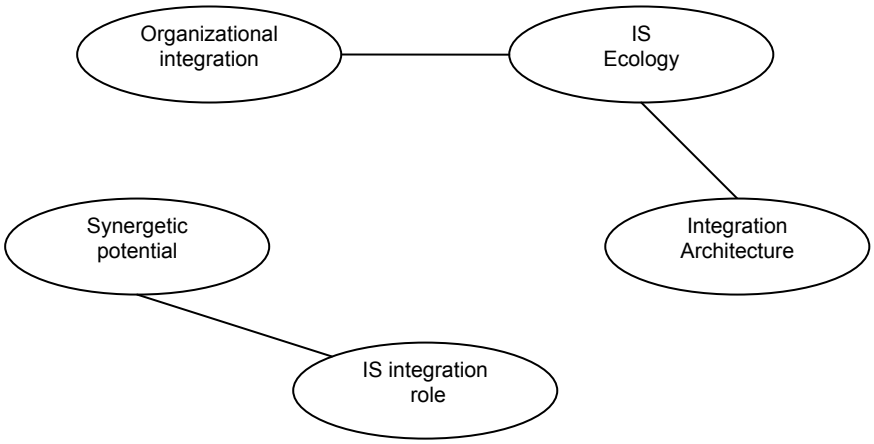


Figure 4.4 Relations between key constructs

used to guide empirical work and analysis. With this summary of the contribution of Chapter 4 ends the first part of this thesis. In the next part will be accounted for the empirical studies of IS integration at four M&As by Trelleborg AB and related analysis to describe and explain the management of IS integration in those M&As.

5. Methodological considerations for describing and explaining IS integration in M&A

Several significant concerns regarding the research methodology are posed due to the interdisciplinary character of IS research. The concerns include recognizing the underlying paradigm, distinguishing the research as data or theory driven, and different aspects of data collection techniques (Mingers, 2003). The field of qualitative research, as of which the study presented here is a part of, includes rich arrays of methods all subsumed with the aim of better understanding a complex social phenomenon (Marshall & Rossman, 1991). Chapter 5 explains how the study through the use of empirical and theoretical sources seeks to fulfill its first purpose to *develop theory that explains the relationship between IS integration and the general M&A process*.

5.1 The choice of qualitative case studies

Within the field of qualitative research there are rich arrays of methods all subsumed with the aim to better understand a complex social phenomenon (Marshall & Rossman, 1991). This study uses a qualitative case study approach to fulfill its purpose and it is here argued why this approach is the most appropriate, given the research questions and existing knowledge about IS integration in M&A. Case research is a well established methodology within the IS research field (Dubé & Paré, 2003). Therefore, the research method as such will not be detailed for justification, only its appropriateness in this specific study. The terminology of case based research is presented to further concretize the study, along with a discussion of what methods will be applied and which options will not be effectuated.

Although many different approaches to case research exist, Dubé and Paré (2003) found that 87 % of the 210 case studies of various aspects of IS that they had investigated were carried out in conformity

with the approach to case research as defined by Benbasat et al. (1987), Eisenhardt (2007), Lee (2007), and Yin (1994). Dubé and Paré (2003) suggest a definition of case study from Yin (1994):

> A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (p. 13).

The choice in the study presented in this thesis is to investigate cases of management of IS integration in M&A processes. The case study approach is, according to the definition above, appropriate if the boundaries between management implications, IS integration process, and the M&A process as a whole are not clearly evident. The theoretical review in Chapters 2-4 presented both what can be labeled as content and process based theory (c.f. Mohr, 1982). Understanding IS integration in M&A, it was claimed, was related to understanding both content and process factors of IS integration and M&A. The methodology applied must thus be appropriate to extract both content and process data. Van de Ven (1992) argues that for creating process models, there is a great need to actually follow the unit of analysis that undergoes the development. The alternative to case studies is cross sectional studies, focusing different organizations or at least on different integration processes. However, although this may give valuable suggestions of the process on a general level, it is not enough to justify the process model (Van de Ven, 1992).

Dubé and Paré (2003) identify 24 study attributes in the three areas of research design, data collection, and data analysis that express what the research society deems to be major considerations of case research (Table 5.1). Attributes of research design are mainly addressed in this section of Chapter 5. Attributes of data collection and of data analysis are mainly addressed in Section 5.4 and Section 5.5, respectively. The attributes are not treated as a blueprint for case studies, but as a collection of aspects that may be relevant for research quality and the communication of the research design to the research community.

Table 5.1 Rigor attributes in case studies

Area	*Rigor attribute*	*Author*
Research design		
	Clear research questions	1, 2, 3
	Multiple-case design	2, 3, 4
	Nature of single-case design	2
	Replication logic in multiple-case design	3, 4
	Unit of analysis	1, 2
	Pilot case	2
	Context of the case study	1, 2
	Team-based research	1, 3
	Different roles for multiple investigators	1, 3
Data collection		
	Elucidation of the data collection process	1
	Multiple data collection methods	1, 2, 3, 4
	Mix of qualitative and quantitative data	1, 3
	Data triangulation	1, 2, 3, 4
	Case study protocol	1, 2
	Case study database	1, 2
Data analysis		
	Elucidation of the data analysis process	1, 2, 3
	Field notes	2, 3
	Coding and reliability check	2
	Data displays	2
	Flexible & opportunistic process	1, 2, 3
	Logical chain of evidence	1, 2
	Searching for cross-case patterns	3, 4
	Quotes (evidence)	1, 2
	Project reviews	2

1 = Benbasat et al. (1987); 2 = Yin (1994); 3 = Eisenhardt (1989); 4 = Lee (1989)

Source: Dubé and Paré (2003, p. 606)

Generalizations from case studies and this type of process studies are made on a theoretical basis, contributing to models and theories which can be argued useful to describe and explain organizational situations. Eisenhardt and Graebner (2007, p. 25) explain the construction of theory in case study research:

> Central to building theory from case studies is replication logic (Eisenhardt, 1989b). That is, each case serves as a distinct experiment that stands on its own as an analytic unit. Like a series of related laboratory experiments, multiple cases are discrete experiments that serve as replications, contrasts, and extensions to the emerging theory (Yin, 1994). But while laboratory experiments isolate the phenomena from their context, case studies emphasize the rich, real-world context in which the phenomena occur. The theory-building process occurs

> via recursive cycling among the case data, emerging theory, and later, extant literature.

George and Bennet (2004) label this type of theoretical generalization "congruence method" that starts with a theory and determines its ability to explain an outcome in a specific case. The congruence method should be contrasted to statistical methods of generalization. The variance theories addressing IS integration success described in Chapter 4 aim at being valid for a limited (in these cases quite broadly defined) population. In contrast, case studies and process theoretical construction are aimed at generalizations at a theoretical level (Yin 1994; Mohr, 1982). The objective is to produce some fundamental mechanisms useful for describing and explaining the order and sequence of events and steps that lead up to the IS integration (c.f. Van de Ven & Poole, 1995). A process theory may also identify certain paths more likely to be effective under certain development conditions (Van de Ven & Poole, 1995).

A profound understanding of the integration process is fundamental to say something of the knowledge required to manage the IS integration. Such a profound understanding of events and the mechanism that connects the events create the need for a certain kind of data. Whereas variance theories describing organizational change make use of quantitative data to induce their model creation, process models are dependent on qualitative, contextualized input (Mohr, 1982). The nature of this study's purpose and prospective research contributions assumes qualitative data being used (Yin, 1994). Based on quantitative data, it would potentially be possible to isolate which characteristics of IS integration and M&A depend on each other, but it would give little insight into what makes the characteristics mutually dependent and how management can influence the dependency, which is part of the purpose of this research. In addition, the research topic of IS integration in M&A, as presented in Chapters 2-4, has not reached the maturity level required to construct the hypothetical relations a quantitative research approach would require. The limited knowledge of IS integration in M&A enforces a research approach which includes characteristics of explorative research in a flexible design approach. The choice between fixed design or flexible design is dependent on prior awareness and possibility to state potential relationships between dependent and independent variables (Robson, 2002).

The above has argued in favor of qualitative research. It should be stressed that the use of qualitative data has no value per se, but is a search based on the argument that it is the kind of data that could in the end render the prospective conclusions of this research as believable. As discussed in Chapter 1, this research tries to make sense of a real world phenomena using available means. Any data or prior research that can shed light on management of IS integration in M&A is thus welcome, and not exclusively qualitative data and research founded upon such sources. While traditionally the distinctions between qualitative and quantitative studies have been of almost paradigmatic nature, several researchers have started to emphasize the need to break down the qualitative/quantitative divide (e.g. Bryman, 2001; George & Bennett, 2004; Robson, 2002). It is counterproductive to isolate one methodological stream (George & Bennett, 2004). When doing qualitative studies, literature describing research based on quantity data should also be regarded. Likewise, conclusions from different schools, such as variance vs process research, could influence each other's research in case studies, something that, for example, Mohr (1982), who holds the view that variance and process research are fundamentally incompatible (without actually giving any argument why it is so), would not agree to. This current research, drawing on George and Bennet (2004), takes the position that case studies benefit from pluralism in gathering techniques and sources and should use the means available to shed light on the phenomenon studied.

5.2 The research process

The outline of this thesis suggests that the research process from identified gaps in theory and practice to final conclusion has been fairly straightforward. This section tries to depict the research process with finer granularity, with the ambition to explain how the research actually unfolded rather than present the constituent parts in a conceivable way.

5.2.1 The role of theoretical and empirical input

The study presented here has included both theoretically deductive and empirically inductive phases. The outline of this thesis suggests a progression where a preliminary theoretical framework was developed

based on the existing literature, and later empirically extended by case-studies which formed the theoretical kernel for prescriptive theory. This disposition is effective to outline undertaken research activities and their individual contribution to the final research contributions, but it does so in a somewhat too simplistic a manner. In reality, theoretical and empirical input has functioned in an iterative process toward the fulfillment of the study's purpose. It is evident that theoretical reasoning and prior experiences already affected this study in terms of perspective selection and choice of methodological approach. The theoretical framework was then used as foundation for empirical data gathering and analysis. Similarly, empirical discoveries were used to direct further theoretical studies and extensions of the theoretical framework. Extending the theoretical framework triggered collection of new empirical material which, in turn, led to a need to extend the framework, and so on.

Iterative cycles of empirical and theoretical phases are considered appropriate when the objective is to develop a profound understanding of a theoretically immature domain (Alvesson & Sköldberg, 1994; Dubé & Paré, 2003; Mays & Pope, 1995; Miles & Huberman, 1994; Yin, 1994). In fact, much research that claims to be inductive often is partly deductive (Alvesson and Sköldberg, 1994). The use of a theoretical framework was criticized during the 90's due to its lack of empirical support and constructed terminology. Today, however, the awareness of prior research on the subject is commonly argued essential for capturing relevant data while doing empirical field work, as it creates the foundation for actually advancing the academic field (Webster & Watson, 2002). The framework also creates the foundation for analytical generalization in case-studies (Yin, 2003). In order to develop the tentative framework, a literature study was carried out. Since IS integration in M&A is a scattered and fragmented research topic, Pawson's (2006) recommendation to center the literature on a desired outcome was followed. The outcome in this case was to identify properties of IS integration with potential impact on the general M&A process, and M&A properties with potential impact on IS integration, in analogy with the study's first research question. This type of literature study is essential to create the kind of evidence based management knowledge which is strived for in the study's second phase (Pawson, 2006).

5.2.2 Research activities

The highly iterative research approach employed can be depicted as in Figure 5.1. The outline is a rough simplification which indicates the major phases of the different research activities. As described above, theoretical, empirical, and analytical research activities were commonly running in parallel although it was possible to identify certain phases where one type of activity was more prominent than another. Initially, there was strong focus on making sense of existing research in order to have a solid foundation to build upon and to identify knowledge gaps that needed to be addressed. Some interaction with Trelleborg representatives did take place during the first year, but information gathered was rather general with the aim of mapping identified knowledge gaps and the availability of empirical data within the Trelleborg group. A second major theoretical phase was also after empirical data for the first case study had been collected, and the preliminary theoretical framework could be revised based on the findings. Similarly, a third theoretical phase was initiated based on the data from the other cases studies.

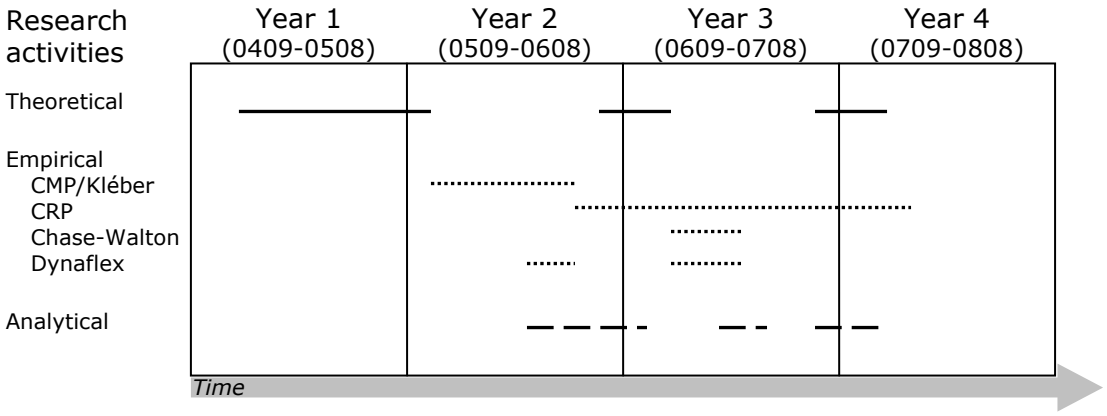


Figure 5.1 Schematic overview of major theoretical, empirical and analytical phases

In three of the four cases studies, empirical data was collected during a relatively limited empirical timeframe. The CRP-case data collection was more wide spread since the goal was to follow the process as it unfolded over time. In practical terms, empirical data collection was directed by the actors involved in the selected M&As. This meant that the primary unit of study and unit of analysis were the business

activities that were to be integrated as a consequence of the M&A. In two cases the purchased unit was combined with Trelleborg on the division level (Chase-Walton- and CRP-cases, see Chapter 7), and in two cases (CMP/Kléber- and Dynaflex-cases) the combination was made on the business unit level. Chapter 6 will explain how the heterogeneous organizational structure of Trelleborg renders integration, sometimes on the division level and sometimes on the unit level when activity integration is sought. In short, the reason is that some divisions have one single business model for the whole division, while others can be regarded as a collection of business models where every unit has a distinct set of business activities.

In this study analytical activities followed upon empirical data collection. Consequently, one major analytical phase was to be found in relation to the termination of the first case study. A second analytical phase was based on the Chase-Walton and Dynaflex data. Chapter 8 presents the results of the two first analytical phases. A final analytical phase was directed to the cross case comparison when most empirical data had been collected. In this analysis the level of analysis was raised to group-level. The four cases were contrasted to find similarities and differences. Through comparison it was also possible to identify if any changes in the way Trelleborg was managing IS integration in their M&As had taken place. The results of this analysis will be accounted for in Chapter 9.

5.3 Case selection

Theoretical sampling, referring to the search for cases fulfilling a set of predefined criteria that would extend or verify an existing theoretical understanding of a phenomenon, was used for case selection. The theoretical framework presented later introduces six dimensions of relevant aspects, including both process- and variance-based research, to consider when understanding management of IS integration in M&A. Using the framework as lens, it sets the stage for which empirical gathering techniques can come into question. The approach of case study was justified with the kind of data required to address the frameworks of content- and process-based dimensions. To understand a process, the researcher needs to probe the events and states that are used

in describing a chain of progression and explain an outcome (Dooley and Van de Ven, 1999; Mohr, 1982).

Van de Ven (1992) discusses the selection of cases on which to base research that investigates an organizational development process. The vast majority of process models are based on retroperspective case studies. Historical cases have the advantage of minimizing risk, as cases can relatively easily be identified as relevant or irrelevant for the process model that the researcher is working on. However, Van de Ven stresses that "it is widely recognized that prior knowledge of the success or failure of a strategic change effort invariably biases a study's findings" (Van de Ven, 1992, p. 181). Historical cases should be accompanied with real-time studies of processes as they unfold in their natural field settings. Van de Ven explains and exemplifies:

> For example, if the purpose of a study is to understand how to manage the formulation or implementation of an organizational strategy, it will be necessary for researchers to place themselves into the manager's temporal and contextual frames of reference. Presumably, this would initially involve conduction of retrospective case history to understand the context and events leading up to the present strategy being investigated. However, the major focus of the study would entail conducting real-time observations of the events and activities in strategy development while they occur in time, and without knowing *a priori* the outcomes of these events and activities. (Van de Ven, 1992, p. 181)

Van de Ven (1992) argues that regularly scheduled and intermittent real-time observations are necessary to observe if and how changes occur over time. Repetitive surveys and interviews provide a basis to define *if* and *what* changes occur. Real-time observations are needed to understand *how* theses changes occur. The need for empirical data puts an intense demand on the level of data access. Approaching IS integration in M&A from a process perspective requires access to corporate strategic planning and ability to actually study the integration work as it takes place.

When studying such a phenomenon as integration in M&A case selection one has to include some degree of pragmatism (Mehta & Hirschheim, 2007). The M&A activity is at the very core of a company's strategic processes and the access required to actually grasp the essential of the integration on a deeper level is a problem when

doing research in this field. In May 2004 the School of Economics and Management at Lund University entered into a partnership agreement with the multinational industry group Trelleborg AB. In a communiqué published by Trelleborg AB the research setup was described as a "learning partnership" where researchers and the company would work together towards mutually established goals (Trelleborg AB, 2004). Trelleborg AB has an outspoken strategy of growth through M&A and makes between 5 and 10 acquisitions yearly. It consists of a typical example of how contemporary business works with extensive M&As, and how it experiences the complexity of related integration work. The partnership opened up the way for empirical data collection of the kind needed to answer this study's research questions, and the selection of Trelleborg AB as source of empirical data was thus natural.

According to Van de Ven (1992), a minimum of two cases are needed - one retroperspective and one real-time. However, more cases improve the chances for more solid research findings (Larsson, 1990) and better understood mechanism relating events (Van de Ven, 1992). In total, four case studies were carried out at Trelleborg before the framework had reached a reasonably stable level where the theory was sufficient to constitute the explanatory basis for prescriptive theory. Additional cases could have introduced a few more relations between IS integration in M&A or marginal adjustments, but generally the last cases confirmed the findings regarding the framework's major themes and basic structure. To substantially improve the framework and research findings, it was deemed that a completely new research approach would be needed, for example, a quantitative or ethnography-inspired study. This is further discussed in the conclusions chapter that addresses future research needs.

The extensive understanding needed of the organizational context and the managerial situation are emphasized as an argument for regarding only cases within the organization, Trelleborg AB. In addition, no study on IS integration and M&A has thus far investigated several M&As and related IS integration made by the same organization. Studying four cases by the same company would give the opportunity to see similarities and dissimilarities in the way IS integration was managed, thus giving a more profound understanding of the management. Appendix B presents a complete list of acquisitions undertaken by Trelleborg AB from 1991 to 2006. Some cases naturally

were more appropriate as empirical sources. For example, the takeover of the Japanese distribution company, Eika, could be considered inappropriate, as access to empirical data was limited by geographical distance and separate languages. In the search for cases was also included the coverage of dimensional attributes. The overarching condition for selecting cases was the estimated potential of the cases to increase the understanding of management of IS integration in M&A. This was the condition in general terms: the specific characteristics that would increase the understanding were specific to each of the cases. The specific sought for characteristics in each case are explained below. Selection had in common that the cases were selected to provide a broad coverage, ideally covering all variations of the theoretical framework. Selection was therefore made in collaboration with Trelleborg representatives by matching the available cases and their potential contribution to the study's purpose and research questions.

5.3.1 Case A: CMP/Kléber

The selection of the first case was decided upon in collaboration with informed members of Trelleborg AB. The most important consideration before selecting this case was based on the awareness that integration following an M&A could take considerable time. The first condition was thus that the case should present a more or less finished integration process. Based on the methodological approach where theory and empirical findings were developed hand in hand, it was considered that for a first case, it was also desirable with an integration process that was known beforehand would end up in integrated IS. As explained in Chapter 4, IS integration is not required in all M&As. An initiative that conformed to both these demands and according to informed Trelleborg representatives included many typical aspects of synergy leverage, the integration issues involved the purchase of CMP/Kléber Industrie. The deal was closed in 1996, and in 2005 the IS integration was finally concluded.

5.3.2 Case B: Dynaflex

The second case drew the attention because of one significant difference compared to the CMP/Kléber case. While in the first case it took 10 years until IS was finally integrated, the desired level of IS integration

was in this case reached within a couple of months. Compared to the CMP/Kléber case, this case also addressed the weakness of being based on actions that had been taken several years ago. The Dynaflex integration presented fresh data and the possibility to reach all involved parts. It also conformed to the criteria of involving some degree of integration and not being an object for complete preservation or holding.

5.3.3 Case C: Chase-Walton

The reasons behind the selection of the third case differed in one decisive aspect from reasons for selecting the two first cases. A retrospective case study can give a good overview of which concepts and problems may appear, but to actually understand the progression of an organizational change process, there is no other option than taking part of the process as it takes place. Real-time observations are needed to understand how theses changes occurred (Van de Ven, 1992). To conduct this type of real-time studies, an extensive organizational access is required, an access that very few researchers have achieved. Fortunately, this access was provided by Trelleborg AB in the partnership setup of this study.

A second important reason for studying the Chase-Walton integration was the expression by Trelleborg representatives that this case reflected a more proactive approach to IS integration. As no such story had been presented in the existing research publications, it was thought of as being able to significantly influence the understanding of the proactiveness concept. The Chase-Walton case also covered different technologies and a different approach to organizing the information infrastructure which would be relevant to further develop the theoretical framework.

5.3.4 Case D: CRP

The fourth case in this study was the acquisition of British/American CRP Group, a deal which was accomplished at the beginning of 2005. The first two cases were studied in retrospection, whereas the third case was caught in the final stages of its integration process. This fourth case, however, did provide the opportunity to study the early stages of the process as access was gained only weeks after the deal was

announced. The anticipated integration need was minor to the needs in the previous cases, which increased the probability for the chances of being able to follow the process to its end. In addition, the CRP-case was selected by theoretically driven conditions. It covered a number of attributes of the framework that were not covered by the other cases, such as technology used, IS importance to business, and desired integration level, which could reveal additional aspects of the relationship between IS integration and M&A.

5.4 Data gathering

Traditionally, case studies have been associated with studies based on qualitative data, but some interpretations of the case study approach argue that there is no need to exclude quantitative data from the data sources (Gerring, 2007; George & Bennett, 2004) The case study data primarily stems from three different sources: interviews, observations, and document studies. In general, the interviews followed the same model, based on a semi-structured approach, in order to be able to cover the theoretically deducted propositions, but at the same time open up for new empirical discoveries as the field is still immature. (See Appendix D for the general interview guide.)

The general guide was a direct mapping from the preliminary theoretical framework where all dimensions and each constituting subconcept of the dimensions were introduced as topics to be covered in the research. Based on the topics in the interview guide, it was in collaboration with Trelleborg that identified which persons could give information on which part of the interview guide so that in the end all topics were covered. For example, an IS manager would be interviewed on the topics regarding how and why IS integration was made, while the financial manager would contribute on the topics related to expected synergies. Consequently, for each interview the guide or parts of the guide were reformulated as questions to fit the knowledge of the interviewee. As the study had a managerial perspective, data gathering primarily emanated from the people being able to influence the process. The interviewees needed to adequately (c.f. Stake, 1995) cover the various actors and management levels that were involved in the IS integration processes studied, which included the integration project

manager as well as representatives of top management, user support, and users of different levels.

In total, 31 interviews were held, as presented in Table 5.2. (See Appendix C for a complete list of interviews.) Interviews were primarily made face to face, ranging from 45 to 120 minutes at the specific unit in case, but also complemented by shorter telephone interviews on certain aspects and more informal discussions (not included in the count below). Interviews were generally tape recorded (parts of a few interviews were not captured due to technical failures) and key sections of the interviews were transcribed. Several of the interviews were intentionally very broad in their scope, touching also upon issues not directly related to the specific M&A, such as the relation between units and the Trelleborg group or the general view of IS importance for business at the business unit. Instead of enforcing conversation to only address the specific M&As, this information was regarded as potentially equally important as it gave insight to understand the context in which IS integration was taking place. However, these broad discussions were not transcribed (unless later used to extend the framework or discuss the findings), but instead summarized in the interview protocol as additional topics addressed during the interview.

Table 5.2 Distribution of interviews

Topic	Number of interviews
General	5
Case Kléber	8
Case Dynaflex	6
Case CRP	6
Case Chase-Walton	6
Total	31

Observations were mainly conducted to preserve the contextual linkage between data and reality (Miles & Huberman, 1994). The observations included visits to the production facilities and tutorials of the systems used. Understanding the context in which the integration process was taking place was seen as vital to understanding the progression. Since it was not always possible to follow the integration process in real time, observations and interviews were complemented by studies of existing documentation. M&As are to a high degree formalized processes that produce extensive documentation. Internal communication, announcements, project plans, minutes from meetings, etc., contain

valuable information, especially in retrospective case studies; these give a less biased view of the progression than interviews. As this type of documentation is both extensive and highly confidential, documents were generally investigated on the spot in the archives of Trelleborg. Interviews were seen as the primary source of information, while documents and observations were used to confirm information given in interviews.

In addition to the mostly one-way information extraction processes that observations, document studies and interviews represent, four more extensive seminars were also held. During these seminars initial findings were reported and discussed with Trelleborg representatives.

5.4.1 Case A: CMP/Kléber

The empirical evidence was mainly collected by interviewing key informants in the consolidated unit. In total, 8 interviews were made with the Group's CIO, the business area IT managers, the units manager, IS manager, plant managers, logistics manager, technical staff and users of the integrated IS. In addition, full access was given to the existing documentation which comprised: 1) internal announcements posted to the companies' intranet, and 2) project documentation in the form of project plans, the investigation reports, cost calculations and decision support reports. Interviews and documentation were also supported by on the spot observations to adequately be able to address the six dimensions of the framework.

5.4.2 Case B: Dynaflex

Apart from additional interviews on the group level, two interviews were held with representatives from the part of Trelleborg effecting the acquisition of Dynaflex. Then, three additional interviews were carried out in cooperation with two master's level students (Santosh Nair and André Mazouch) as part of their master's thesis project (Nair & Mazouch, 2007). The interviews were based on the same interview guide as interviews held in the CMP/Kléber case, but were transcribed and initially analyzed by the students.

It is not expected that master's students carrying out the interviews should affect the information obtained regarding the previously

identified aspects already covered by the framework and the interview guide. Eventual problems would lie in the aspects not covered by the interview guide. The interview by a physical meeting is a rich communication in which the spoken words only are one part of the information exchange. As interviewers, the master's students were the interpreters of this additional information which could be argued to be based on personal experiences and previous knowledge, and thus seen to be subjective from interviewer to interviewer. However, although probably slightly different, there were no reasons to believe that the interpretation of the two well informed students would be less reasonable than the interpretation of the author of this thesis. On the contrary, due to the subjectivity of qualitative research, it was considered an enrichment of the study to have additional researchers involved in data collection and later also in analysis of the data to limit the effect of the individual researcher's biases. To involve several persons in data collection, interpretation and analysis is a recommendation for increasing the reliability of qualitative research (Miles & Huberman, 1994).

The sound capture of the interviews and the subsequent transcription protocols were handed over to the author of this thesis to investigate the validity and for use in further analysis.

5.4.3 Case CRP

Interviews were made with the group CIO, business area manager, and business area IT manager. Interviews were this time supported by some documentation from the integration process.

5.4.4 Case Chase-Walton

This case study also involved two master's level students (Mikael Dudas and Peter Tobisson) and their master's thesis project (Dudas & Tobisson, 2007). The interviews were based on the same interview guide with extensions to also map to the students' theses. Interviews were recorded on the spot in Sophia Antipolis, France, and along with the transcription protocols handed over to the author of this thesis. In total, six interviews were made, of which fivewere transcribed and one only documented as notes.

5.5 Data analysis

The use of the theoretical framework consequently sets the structure for the analysis. Although semi-structured interviews, broad observation and other inputs make changes to the framework possible, as the research process is executed, the major focus is to be found in the framework. In the ambition to increase the effectiveness of the framework, a tentative first version of the framework was put through frequent revisions as to capture what was revealed during empirical inquiries. The iterative cycles between empirical and theoretical input included early analysis of empirical data to direct further studies.

The analysis of the case data was divided into three phases: data reduction, data display, and conclusion drawing and verification. Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in the written-up field notes or transcriptions (Miles & Huberman, 1994), which in this study was done by transcribing the essence of the taped interviews. The answers were then coded and grouped according to the theoretically defined proposals, meaning that information was organized along the preliminary framework dimensions and potential directions to extend the framework.

It should be acknowledged that the master students significantly contributed through their initial analysis and ability to explore paths that were not thought of. Their ideas and contributions in their analyses as part of their thesis works have made significant footprints in revising and extending the theoretical framework. To have a number of people trying to take in, make sense of, and finally employ the intermediate theoretical contstructs and initial findings has been perceived as one of this thesis major strengths.

5.6 Evaluating descriptive and explanatory contribution

The primary purpose, as stated in chapter 1, was to develop theory that explains the relationship between IS integration and the general M&A process. It was said that the first contribution of the study should be theory for explanation (c.f. Gregor, 2006). As no descriptive framework existed that could be used in creating this explanatory theory, the task

was set to create a framework for describing IS integration in M&A. This means that after the case studies have been carried out and the empirical material analyzed, the then existing outcome should be assessed by quality criteria for theory for describing and explaining the relationship between IS integration and M&A. Using the framework, it should be possible to describe the decision on IS integration taken and which consequences they had. The contribution can be divided into two parts:

a) The framework should be evaluated according to criteria assessing "theory for analyzing," a type of descriptive theory (Gregor, 2006).
b) The explanation of the relationship between IS integration and M&A should be evaluated by criteria for explanatory theory.

5.6.1 Evaluating the framework: criteria for descriptive theory

The overall objective for theory for analyzing is "what is" (Gregor, 2006). The descriptive framework is to its essence a classification tool, pointing the attention towards certain characteristics of IS integration and M&A processes. Such constructs should be evaluated regarding its usefulness (Gregor, 2006). In this specific context, it means that the descriptive framework should be evaluated based on its contribution to explanation of the relationship between IS integration and M&A. This evaluation condition may be labeled *explanatory potential*.

Two more criteria are useful to evaluate the framework. The concepts and categories used need to possess *distinctiveness* and *simplicity*. Distinctiveness means that boundaries between categories and characteristics that define each category are clear. The empirical phenomena encountered should also be possible to categorize according to these criteria without too much difficulty (Gregor, 2006). Simplicity refers to the phenomena, such as IS and M&A, in which a multitude of taxonomies, typologies, and categorizations exists. Including them all would render a categorization of monumental complexity that becomes completely impossible to use. That is, in order to achieve usefulness, simplicity must also be achieved, meaning a tradeoff between possible categorizations and their contribution towards explanatory potential.

5.6.2 Evaluating the explanatory theory: criteria for explanatory theory

Not only the framework needs to be evaluated, but also the contribution that seeks to explain consequences of the managerial decision regarding IS integration in M&A needs to be assessed.

The framework will, as explained above, be evaluated based on how it contributes to the explanation of management on IS integration in four cases of M&A and the decisions' consequences, as it was this need that initiated the framework's construction. The explanatory theory has two reasons for its existence: a) as foundation for creating prescriptive knowledge in the second phase of this thesis (Part III), and b) a value per se, contributing to the first purpose of the thesis, which is considered valuable in its own. There are thus two types of evaluations of the explanatory theory that can be made. Since the usefulness in developing prescriptive knowledge cannot be assessed before an attempt is made, the evaluation is presented in the last chapter of the thesis.

Explanatory theories "need to be new and interesting, or to explain something that was poorly or imperfectly understood beforehand. With case studies, more than just a 'story' is expected, as to qualify as theorizing the exercise must lead to conclusions with some generality" (Gregor, 2006, p. 625). This can be summarized in the two conditions of novelty and generalizabillity. Novelty simply means that what is explained, was not explained before. Generalizability in this study is, as has been explained in this chapter, a matter of creating some sort of generic logic that is valid within a defined context. Gregor (2006) also argues that generalizations should be assessed by *plausibility*, *credibility*, and *consistency*. For qualitative research, clearly defined numeric criteria are defining what is acceptable. For qualitative research, Guba and Lincoln (1994, p.114) acknowledge, "The issue of quality criteria…is…not well resolved, and further critique is needed." However, some consensus also exists on the criteria for qualitative research, although the assessment is more subjective to the evaluator. Guba and Lincoln (1994) suggest four criteria used to evaluate qualitative research, that are widely used in qualitative IS research:

1) *Credibility* – Confidence in the 'truth' of their findings. The degree to which findings make sense. Credibility is built up

through prolonged engagement in the field and persistent observation and triangulation of data.

2) *Transferability* – Researchers are encouraged to provide a detailed portrait of the setting in which the research is conducted. The aim is to give readers enough information for them to judge the applicability of the findings to other settings.
3) *Dependability* – The existence of a trail (the documentation of data, methods and decisions about the research) which can be laid open to external scrutiny.
4) *Confirmability* – Auditing as a means to demonstrate quality. For example, the researcher can offer a self-critically reflexive analysis of the methodology used in the research. In addition, techniques such as triangulation (of data, researcher, context) can be useful tools of confirmability.

The views of Gregor (2006) and Guba and Lincoln (1994) roughly correspond with Gregor (2006), but also add the criteria of novelty. These five criteria will be used to evaluate the explanatory contribution in Chapter 12.

5.7 Contribution of Chapter 5

The second part of this thesis presents the empirical study of four cases of IS integration in M&A. Chapter 5 has explained how this study aims to fulfill the first purpose of this thesis and why the research was done the way it was.

Given the first purpose and research questions R1 and R2, it was argued that the study primarily had to be based on qualitative data with a preserved contextual link to identify decisions made, motivations for the decision, and the consequences of the decision. It was also argued that the use of a theoretical framework as a basis for the studies was essential in order to know which data to look for when interacting with the empirical phenomenon, and to assure that the study extended the accumulated knowledge of IS integration in M&A. A flexible design approach in which empirical findings and theoretical input through mutual interaction in iterative cycles was, however, required since the field of IS integration in M&A was still immature in terms of conceptualization and theorizing.

This fifth chapter has also presented the careful selection of cases that were used to extend the understanding of IS integration in M&A and how the collected data were analyzed to discern the relationship between IS integration and the M&A context. In the next chapter the theoretical framework that consisted the basis for the study will be presented in detail.

6. A Preliminary Theoretical Framework for IS Integration in M&A

Both IS integration and M&A are in themselves multifaceted and complex phenomena. As shown in Chapters 2 and 3, they can be addressed in numerous compatible and incompatible ways. Applying a managerial perspective on IS integration in M&A, the chapter places the focus of the framework on aspects of IS integration and the M&A that can be affected by management that influences the managerial decisions that have to be considered.

Although the literature may at first glance seem sprawling, further scrutiny of the vast works revealed some recurring themes. Chapter 2 purported that there is a difference between various kinds of IS, that IS integration may be implemented in several different ways, and that managing IS integration at the bottom line is related to understanding its role in business. Chapter 3 conveyed the potential ways of creating synergetic effects, the need for organizational integration in order to actually leverage the potential, and the cumbersome integration process that needs to be managed appropriately if even the most promising M&A aims to reach its objectives.

6.1 Use and structure of the framework

This part of Chapter 6 presents a combination of theories on IS integration management, M&A, and management of IS integration in M&A into a theoretical framework for describing and explaining the relationship between IS integration and the M&A process. Using the framework, it should be possible to describe the decisions on IS integration taken and the consequences that they engendered. It is the aim of this section to capture the essence of the two phenomena and thus guide the empirical work in a fruitful direction, fruitful in the sense that studies based on the framework can reveal important insights

on how IS integration and M&A relate to each other. The elements in the framework are derived from Chapters 2 – 4, and the element presentations are basically summarizations of presentations made in these chapters. What is new in Chapter 6 is the manner of presenting these elements in broad dimensions and how existing research suggests that these elements relate to each other. The main objective of Chapter 6 is not the introduction or development of new information, rather, the chapter is fundamentally eclectic; it serves to help the reader understand from which knowledge the empirical studies took its departure.

If returning to Chapter 1 and the purpose of this thesis, it was stated in the two first research question that the interest was in aspects of IS integration, aspects of the M&A process and the relations between these aspects. Chapters 2-4 have presented these aspects that are here grouped into broad dimensions. The relations between aspects of IS integration and M&A are depicted in Figure 6.1 In the figure, Dimension A contains three aspects where of Aspect A1 have some kind of interdependent relation to Aspect B1 in Dimension B. More concretely, if Dimension A is, for example, "Synergetic potential," Aspect A1 could be "Technical economies." If Dimension B would be "Integration architecture," Aspect B1 could be "Middleware-architecture." Relation "a" would then be some relation between technical economies and middleware-architecture, for example, that technical economies are appropriate or inappropriate to integrate with middleware architecture because of some reason. The collection of relations between Dimension A and Dimension B is in this text labeled "Relationship A-B."

6.2 Elements of a theoretical framework of IS integration in M&A

The presentation of theoretical foundation, the deductive integration of theory, and finally this combination into a theoretical framework, follows a straightforward and, of course, somewhat too simplistic progression. The framework is the result of a highly iterative construction process where both theoretical and empirical findings along the process have led to reconsideration of the framework dimensions and foundation. Earlier versions of this framework have

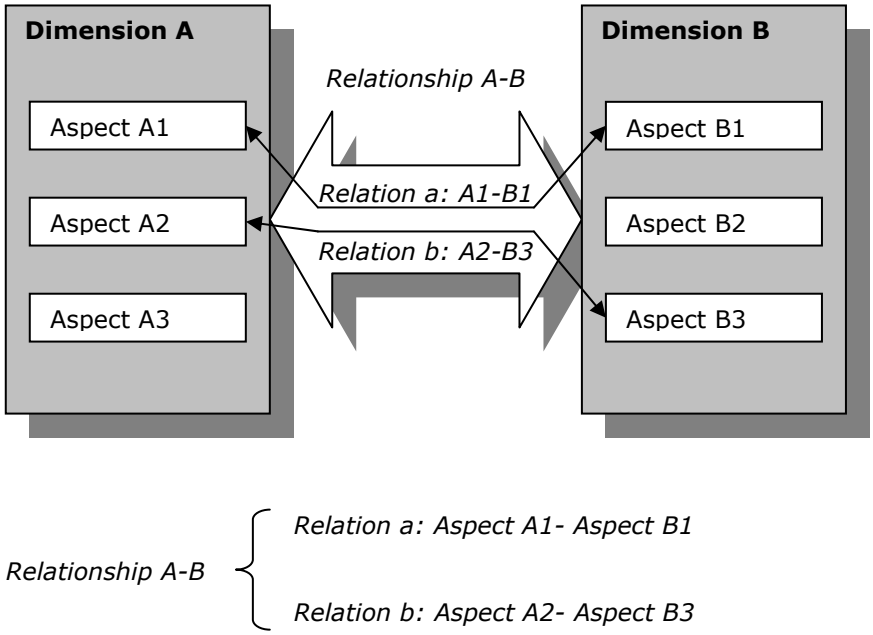


Figure 6.1 Description of how ”dimension”, ”aspect”, ”relation”, and “relationship” are used in the thesis.

been published in Henningsson (2005b), Henningsson and Carlsson (2006b; 2007), Carlsson & Henningsson (2007), with the Henningsson and Carlsson paper from 2007 as the most updated.

At the end of each of Chapters 2-4 a summary of the described theories were presented; these can be found in Table 2.4, Table 3.2 and Table 4.1, respectively. Integrating these three tables into one, we end up with Table 6.1. Based on the literature reviews in chapters 2-4, there are six emerging research streams that address different aspects of IS integration in M&A, expressing managerial issues that have to be considered during the M&A process. The six streams are here described as dimensions of the framework and correspond directly to what was brought forward as the essential aspects in the literature review. These six streams are: A) *synergetic potential,* B) *organizational integration,* C) *intention and reaction,* D) *IS type,* E) *integration architecture*, and F) *IS integration role*. In the following paragraphs the dimensions are presented as dimensions in a descriptive framework for IS integration in M&A and their supporting literature are discussed.

Table 6.1 Six dimensions of IS integration in M&A

Dimension	*Description*	*Classification*	*Indicative references*
A. Synergetic potential			
Technical economies	Scale economies that occur when the physical processes inside the firm are altered so that the same amounts of input produce a higher quantity of output, or the same quantity of output is produced using fever resources.	Marketing, Production, Experience, Scheduling, Banking, Compensation	(Howell, 1970; Shepherd, 1979)
Pecuniary economies	Correspond to the firm's capability to dictate market prices by making use of market power achieved primarily by size.	monopoly, monopsy	(Porter, 1980; Shepherd, 1979)
Diversification economies	Diversification economies are achieved by improving the firm's performance relative to its risk attributes, meaning to spread risk among unrelated markets and products trough a strategic product portfolio.		(Higgens & Schall, 1975; Lewellen, 1971)
B. Organizational Integration			
Interdependency type	Organizational units with relations to each other can have three types of mutual dependencies.	Pooled, Sequential, Reciprocal	(Thompson, 2003)
Degree of Integration	The aspired level of integration is not always complete absorption, but can rather be of different degrees.	Holding, Preservation, Symbiosis, Absorption	(Haspeslagh & Jemison, 1991)
Integrated Activity	Which part of the organization being object for integration is related to the amount of resources needed.	Operational, Functional	(Barki & Pinsonneault, 2005)
C. Intentions & Reactions			
Friendliness/Hostility	The continuum depicts different levels of "hostility" based on the acquired units stated before the M&A and the purpose of the takeover.	Rescue, Collaboration, Combination, Takeover	(Pritchett, 1985)
Reaction	Humans are considered key components of modern organization, and an M&A can trigger extensive resistance and employee turnover.	Turnover rate, Level of distrust	(Napier, 1989; Buono & Bowditch, 1989)
D. IS Ecology			
Function	A contemporary IS base consists of several heterogeneous systems. A typology based on supportive function is argued appropriate for this framework.	Infrastructural, Informational, Transactional, Strategic	(Weill & Broadbent, 1998)
E. Integration Architecture			
Integration level	IS can be integrated on several different levels, all with their individual advantages and disadvantages.	IT, Infological, Organizational (business)	(Al Mosawi et al., 2006; Iivari, 2007)
Integration structure	The actual linkage between two or more systems can be organized in several ways.	P2P, Middleware, Enterprise-wide, Meta-level, SOA	(Markus, 2000; Davenport, 2005; Zhu, 2005)
F. IS integration role			
Proactivity	It has been suggested that IS should be a part of pre-M&A due diligence and not, as currently, a post-M&A issue.	Proactive, Reactive	(Merali & McKiernan, 1993)

The framework includes three dimensions derived from the M&A literature (A-C) and three from the IS integration field (D-F). Of these, four are content-oriented to their character and two are process-oriented. The content oriented are related to the desired end of the integration (A and D) and to the starting condition (B and E). The process-oriented dimensions (C and F) are abstractions of the M&A process and the role of IS integration in the process.

6.2.1 Dimension A: Synergetic potential

The concept of synergy is fundamental to understanding the reasons that corporations participate in M&A activities, as synergies in this context are defined as what is occurring when two units can be run more efficiently and/or more effectively together than apart (Lubatkin, 1983). In this thesis the synergies that are related to internal integration for its leverage are in focus. The literature describes three basic types of synergies as possible outcomes of M&As: *technical economies, pecuniary economies* and *diversification economies* (Lubatkin, 1983). Technical economies are scale economies that occur when the physical processes inside the firm are altered so that the same amounts of inputs produce a higher quantity of output, or the same quantity of output is produced using fever resources. Pecuniary economies correspond to the firm's capability to dictate market prices by making use of market power achieved primarily by size. Finally, diversification economies are achieved by improving the firm's performance relative to its risk attributes, meaning to spread risk among unrelated markets and products through a strategic product portfolio (Lubatkin, 1983). Table 3.1 presented sub-categories for each kind of economy that are useful in analyzing the potential of an M&A.

M&A typologies based on strategic fit have the synergetic potential as common point of reference (e.g. Federal Trade Commission, 1975; Larsson, 1990). The American Federal Trade Commission (1975) suggested a classification scheme for acquisitions that has been a common starting point for many strategy researchers (Risberg, 1999). The scheme classifies M&A into: *horizontal, vertical, product extension, market extension,* and *conglomerate categories*. In horizontal mergers the two involved organizations produce one or more closely related products or services to the same market (Buono & Bowditch, 1989). The rationale behind this kind of M&A is mostly related to technical

economies (Lubatkin, 1983). Vertical M&As are also driven by technical economies and a desire to reduce uncertainties in the corporation's environment (Lubatkin, 1983). In these M&As, the two involved parts have potential buyer-seller relationships (Buono & Bowditch, 1989). M&As of the product extension category indicates that the combination of two corporations have related areas, but not directly competing products (Buono & Bowditch, 1989). Potential synergies are found in overhead costs, distribution and marketing (Lubatkin, 1983). The last category of M&A is the unrelated category, referred to as conglomerate M&A, a category in which motivation normally is related to financial synergies and risk reduction.

The FTC-framework and similar constructs (e.g. Larsson, 1990) present categories where potential synergies are grouped together in type-cases. They may be useful in understanding the complete set of synergies related to one specific M&A, but the construct acts only as a proxy for regarding what really makes up the essence of strategic potential: the synergetic effects. Further, the classification into type-cases can be criticized for being too simplistic – real M&A's include elements of many type-cases. Therefore, if striving for the strategic fundamentals of M&A, basing the strategic dimension on sources of synergetic potential directly should be preferable.

6.2.2 Dimension B: Organizational integration

To actually leverage the synergetic potential of an M&A, the two organizations must be integrated in some way (unless it is an unrelated M&A). Through the literature review, the M&A issues related to organizational integration were amalgated into four subcategories: degree of integration, interdependency type, integrated activity, and cultural integration. These four categories represent the main focal points of previous research.

To represent the degree of integration, a typology by Haspeslagh and Jemison (1991) was chosen. They found in their studies that the transformation in an M&A could be sorted into four categories: *holding, preservation, symbiosis,* and *absorption*. The two dimensions in Figure 6.2, *strategic interdependence* and *organizational autonomy*, were found to be the two most important drivers for deciding the integration approach in a study by the two researchers. Holding represents an approach where the acquired unit is left undisturbed. Preservation

includes partial integration of the new entity. Symbiosis refers to a situation where the acquirer and acquired (or the entities in a merger) are equally transformed to fit each other. Finally, absorption is the complete incorporation of an acquired unit into the acquiring organization. As the general organizational integration sets the context for related IS integration, the second dimension of the framework should be the M&A integration typology by Haspeslagh and Jemison (1991).

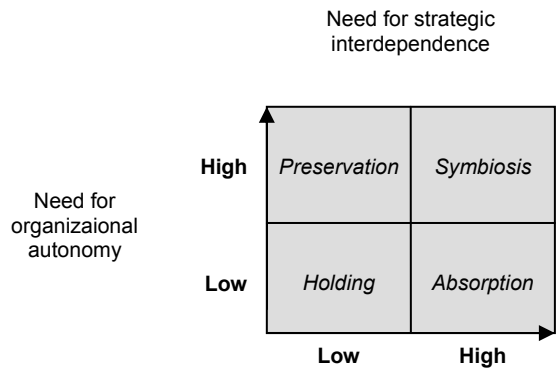


Figure 6.2. Integration typology based on integration degree.

The model above encapsulates the essence of organizational fit, recognizing that all M&As do not need the same degree of integration and address potential problems of the desired integration level. In such a sense, it can be said to have links with the RBV perspective and its combination of resources to achieve competitive advantage. It also takes into account the risk of destroying key resources and capabilities by assimilation into another organization.

One of the more critical aspects, according to the existing literature, to consider when addressing the integration need is corporate culture. If extensive integration is needed, cultural compatibility should be of high importance. Several authors (Buono & Bowditch, 1989; Jeminson & Sitkin, 1986; Larsson & Lubatkin, 2001; Nahavandi & Malekzadeh, 1988) describe how dissimilarities in both corporate and national/regional culture can severely challenge the desired integration being reached. As the chosen definition of IS (see chapter 2) does include the human interpreter of data to information, the cultural aspects of the integration should be considered.

When it comes to integrated activity and organizational dependency, Barki and Pinsonneault (2005) drawing upon Thompson (Thompson, 2003), showed that different organizational activities demanded different efforts for being integrated. They argued that this was due to different types of dependencies. Thompson (1967) argued that interdependencies between units are the starting point for integration. These interdependencies could be of three types:

- Pooled: where each part of the organization makes a contribution to the whole that form an organization. Different parts of the organization do not, however, need to depend directly on each other.
- Sequential: where the output of one is the input for another. A typical example is an industrial value chain.
- Reciprocal: where the output of one part is the input for another, which in turn, directly or via proxy, is the input for the first unit.

According to Barki and Pinsonneault (2005), the different dependencies are normally not evenly distributed over the organization. Sequential and reciprocal dependencies are more frequent among operational than functional units. As the three dependencies are said to be hierarchical, pooled being the basic form, sequential containing a pooled aspect as well as further dependency, and finally reciprocal being sequential plus something more, complexity of integration increases with the dependency level (Thompson, 1967). Taken together, this means that integration of operational units requires more effort than integration of functional units.

6.2.3 Dimension C: Intention and reactions

Content oriented research (c.f. Mohr, 1982) dominates both the M&A and IS fields; consequently, the theoretical foundation for defining process oriented dimensions is more limited. Dimensions A and B build upon content-oriented theories when they consider different pre- and post-states. This third dimension recognizes that not only the potential of the M&A is of importance to the outcome, but also the way the deal and following integration are managed. A common

approach to the M&A process is to divide it into different phases. The most simple is a differentiation between pre- and post-M&A activities, but as depicted in the literature review, phase models of up to 8 phases exist. However, they all conforms to the same logic of one pre-M&A phase, the settlement of the deal, and finally one post-M&A phase where the plans are actually implemented. None of the existing phase-models are particularly developed to grasp the IS integration process, so at this stage of framework development the generic model by Haspeslagh and Jemison (1991) that divides the process into pre-M&A, deal, post-M&A is preliminarily chosen as activity classification. However, rival classifications are kept in mind for further inclusions.

One M&A typology that recognizes that M&A integration does not always follow the same pattern is the Hostility-Friendliness continuum, originally developed by Pritchet (1985). One extreme of the continuum is labeled "Friendly" and the other extreme is labeled "Hostile" (Figure 6.3).

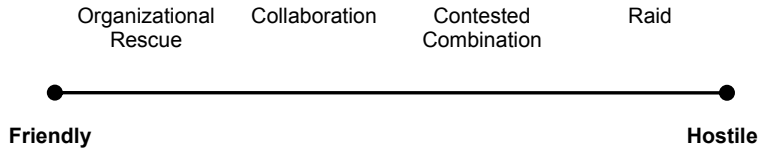


Figure 6.3. Friendliness - Hostility Continuum. Adapted from Buono and Bowditch (1989) based on Pritchett (1985).

The friendliest form of acquisition is the *organizational rescue*. Generally, this type of M&A is well perceived by the target. The next degree of M&A friendliness is a *collaboration*. This is by nature more of a neutral merger than an acquisition. The objective is to reach a fair deal for both companies, but some of the problems that arise are related to the way in which the combination is communicated to personnel and the inability to follow up on hasty promises (Buono & Bowditch, 1989). In *contested combinations* only one of the companies wants the deal, or the companies would prefer completely different arrangements (Buono & Bowditch, 1989). Finally, *raids* are the most hostile type of M&A (Buono & Bowditch, 1989). During raids, one company takes over another by bypassing management and directly asking shareholders to sell their shares (Buono & Bowditch, 1989). Raids are

likely to trigger resistance among employees leading to turnover of key employees and increased levels of distrust.

When earlier combining the strategic process perspective and theory on IS integration it became apparent that strategic process had far reaching implications also for the IS integration process. The logical incrementalism is compatible with the friendliness-hostility continuum in that the approach to the M&A, and in the prolongation also the reactions towards the integration, may shift during the process. The continuum is also a suitable starting point to analyze who is managing the integration process and which other stakeholders can influence the progression.

6.2.4 Dimension D: IS Ecology

Thus far the described dimensions have been based in the general M&A phenomena and the investigation regarding what this theory introduces as relevant aspects to consider for the IS integration phenomena. The last three dimensions are rooted primarily in the IS integration literature and included because, as presented in Chapters 2 and 4, they highlight aspects of IS integration that potentially can be used to describe and explain management of IS integration in M&A. Dimensions A-C recognize that M&As are different from each other. Similarly, it has been noticed several times that the IS artifact in itself is so complex and differentiated that also the nature of the IS artifact must considered when discussing managerial and organizational aspects of IT (e.g. Orlikowski & Iacono, 2001).

When it comes to IS it has been recognized that the term IS may refer to a number of fundamentally different systems that all need to be considered individually. Just as acquisitions and acquisitions were argued fundamentally different from each others, different types of IS and different parts of one IS are affected differently and have different effects on the M&A. Instead of focusing on the systems' technology, this thesis argues, drawing on Weill and Broadbent (1998), that a differentiation founded on the system's function is more appropriate when it is not the technology itself, but it is the possibility of contributing to the business of the organization (in this case to complete the integration) that should consist the foundation of an IS. Weill and Broadbent (1998) divide IS into *Infrastructure*, *Transaction*, *Informational*, and *Strategic* IS. Infrastructural IS is basic technology

that consists of the information road network: servers, cables, software that permits information flow. Included in the category of Transaction IS are, for example, sales systems and book keeping software. Transaction refers to business transactions. A decision support system serving managers with information on sales figures or customer satisfaction is an Informational IS. Finally, Strategic IS are IS that have direct impact on the competitive ability of the company, rendering competitive advantage rather than being a strategic necessity.

Inspired by the thoughts of information infrastructure, this dimension is labeled IS ecology to depict that a company's collection of IS is not one particular IS, but rather a number of interrelated IS. The reason the term information infrastructure is not used is that it has come to denote only the hardware and software, similar to a transportation infrastructure consisting of roads and railways. Bearing in mind the discussion of IS and IT in chapter 2, the software and hardware represent the IT system and another concept is required to grasp the interrelated collection of IS: the IS ecology.

6.2.5 Dimension E: Integration architecture

There is not only one single way to carry out IS integration. In the literature two ways of describing the bonds that are made in integration activities were identified. First, the integration of IS can be made on different levels. Additionally, the IS level itself, the Organizational Integration was relevant to understand the purpose of IS integration work and how it could contribute to organizational performance. Further, the IT system level, addressing in more practical terms how the enabling IT integration could be implemented, also had a significant implications on the IS level. None of these levels can possibly be ignored if one contends to approach the subject of IS integration comprehensively.

Further, linkage between IS can be structured according to different architectural principles. Figure 6.4 depicts five alternatives identified in the literature. The first solution is a point-to-point alternative, where a software bridge, also known as interface, connects two applications directly to each other. Data from one application, A, is more or less automatically transferred to another application, B. If there is a need to integrate a third application, C, two new interfaces have to be built connecting A and B. If a fourth application needs to

communicate with the other three, three new interfaces need to be created, and so on… It is easy to imagine the complexity of such a system if many entities need to communicate with each other.

Figure 6.4. Approaches to IT-integration (Markus, 2000; Davenport, 2005; Zhu, 2005)

To decrease complexity, an approach that uses an intermediate layer between applications and databases called middleware can be used. Applications are modified to call the middleware, M, instead of calling each other directly. The middleware, in turn, calls targeted applications or databases. As a consequence, each unit needs only two interfaces, one outgoing and one ingoing, to the middleware.

The third alternative is to adopt an enterprise-wide system, E, often referred to as enterprise system or ERP (enterprise resource planning) system (Markus, 2000). In these systems the different applications employ a shared database. The result is that all applications' data are updated simultaneously since they are using the same data. Although real-world settings usually consist of combinations, these idealized architectures enables a descriptive analysis of the architectural concept chosen in an integration attempt.

Data warehouses (D) are central in the fourth conceptual approach to integration architecture. Data are extracted from source systems to a meta-level layer. The advantage is the undisturbed, unchanged systems and the disadvantages include insufficient data details and problems of achieving business process integration.

Finally, the Service Oriented Architecture (SOA) is still relatively unproven, but comes with promise of scalable and flexible architectures in that every single module stands alone and might be added or withdrawn as the need for it fluctuates.

This classification above has the advantage of being conceptual, rather than empirically driven. One alternative would be to focus the numerous techniques and technologies, such as Service Bus and EAI, that flourish on the IS integration market; however, differentiations

among the concepts are often difficult as limits tend to differ from author to author and also evolve over time. The classification above is chosen as it is likely to show more stability, thus enabling conclusions that persist during a longer period of time. Although trends come and go, the fundamental architectural principles persist.

6.2.6 Dimension F: IS integration role

Although many authors regard integration as a post-M&A issue, processes that are meant to end in integrated organizations can be traced back to well before the M&A deal is closed. McKiernan and Merali (1995) argue that an important distinction to understand IS integration in M&A is whether IS integration is a post-M&A issue, dealt with reactively, or an early issue on the agenda, used proactively to maximize chances for positive outcome. McKiernan and Merali (1995) argue that currently IS integration is considered by managers as a post-M&A issue, dealt with reactively. However, according to the authors it should be an early issue on the agenda, used proactively to maximize chances for positive outcome. Later surveys continue to report that managers still regard IS as a post-M&A issue (Accenture, 2006; Rodgers, 2005)

6.3 The complete framework

The complete framework is summarized in Table 6.1 and the overview is depicted in Figure 6.5. In the very centre is the IS integration in M&A surrounded by the six dimensions that are based on the existing research on IS integration in M&A which seem to have potential for describing and explaining IS integration in an M&A process. All integration activities have at least one value in each dimension, but larger projects naturally span over many of the attributes.

The above has described the internal sides of the dimension, but the literature also suggests a number of relations between the dimensions (Figure 6.6). While surveying and combining the theoretical fields in chapters 2-4, a number of potential relations were identified. Some relations were based on pure deduction by comparing theory, others were the result of limited empirical studies. However, the identified relations consist of a good starting point for studies on the

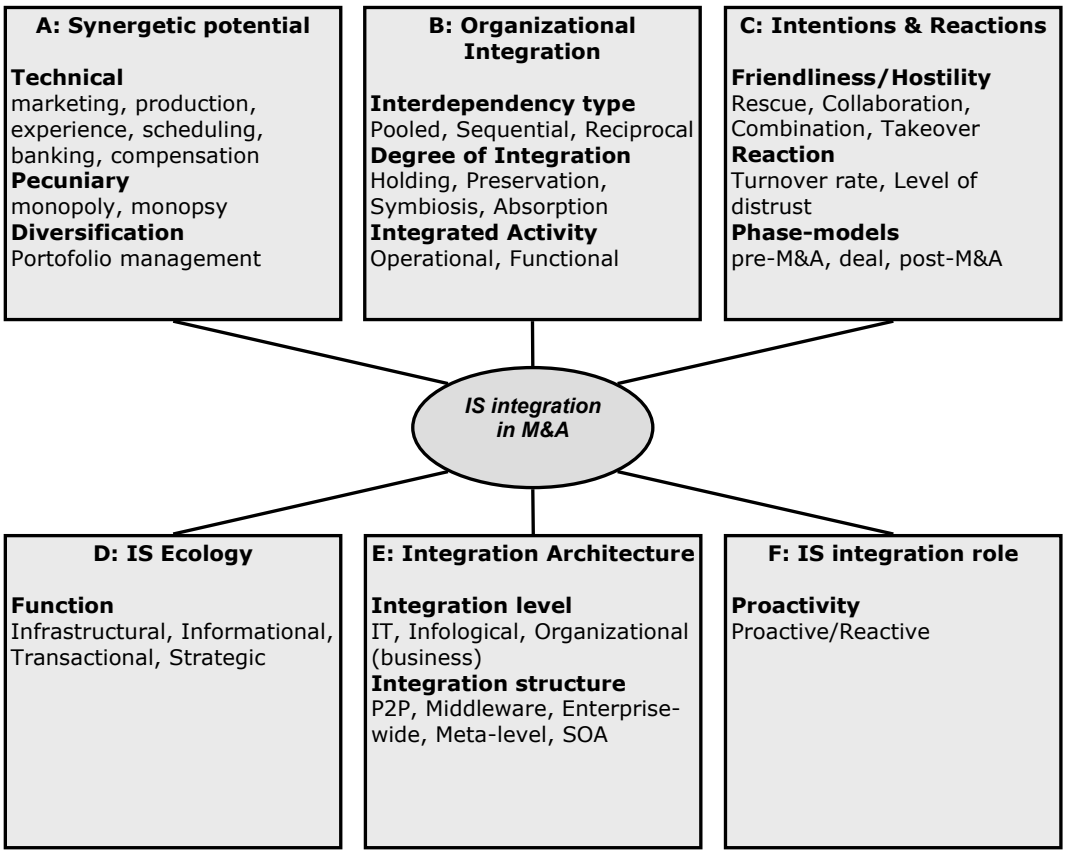


Figure 6.5. A framework for IS integration in M&A

relationship between IS integration and M&A. Chapter 2 presented 3 potential relations, which were summarized in Table 2.5. Relations are numbered according to the dimensions to which they relate. The three relations are indicated in Figure 6.5:

BD1: B. Organizational Integration – D. IS ecology: Operational integration requires integration of the internal value chain, which requires heavy integration of Transactional IS. Functional integration, in turn, is related to integration of Information IS. The more complex dependency of operational units should make integration in Transaction IS more demanding in terms of resources and time, compared to Informational IS (Barki & Pinsonneault, 2005; Weill & Broadbent, 1998).
DE1: D. IS ecology – E. Integration Architecture: If integration of Transaction IS, as suggested, is more demanding and requires deeper coupling than Informational IS, then there are consequences for

selection of the integration architecture. Integrating a whole operational chain with point-to-point architecture should logically be too complex. In this case a single system, not perhaps a complete Enterprise-wide, but at least some sort of "process wide" architecture can be claimed more suitable (Markus, 2000).

DE2: D. IS ecology – E. Integration Architecture: If the IS is business critical then integrating with point-to-point or middleware could be preferred in favor of an enterprise wide system. Implementing a new enterprise wide system is a highly risky and complicated process. Integrating existing systems is arguably less difficult and risky than a complete transition (Markus, 2000).

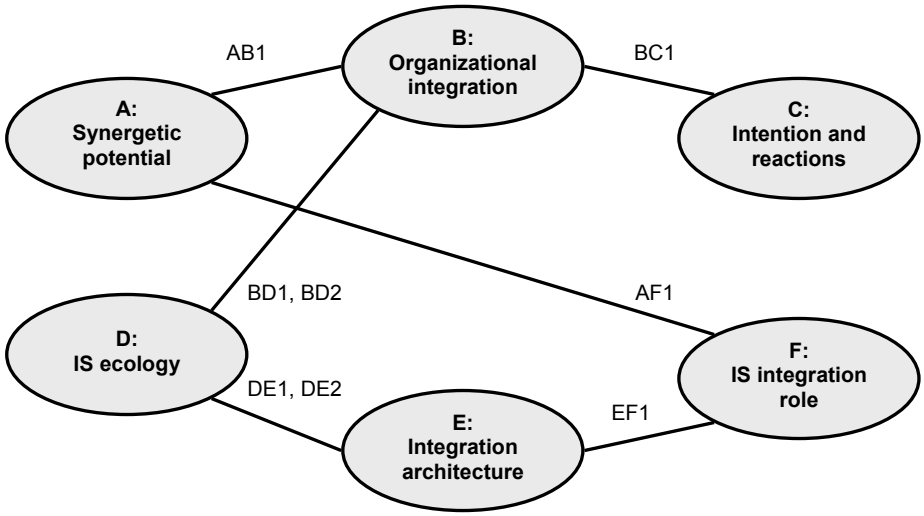


Figure 6.6. Deductively identified relationships between dimensions of IS integration in M&A.

In Chapter 3 with focus on general M&A characteristics, three additional relations with possible impact on the IS integration were identified:

AB1: A. Synergetic potential – B. Organizational integration: The degree and mode of integration should be dependent on synergies expected as higher levels of integration is resource demanding (Haspeslagh & Jemison, 1991). In chapter three it was explained how different kinds of synergies were leveraged by different levels of integration. Leveraging

monopoly synergies do not demand integration to the same extent as production or scheduling synergies.
AF1: A. Synergetic potential – F. IS integration role: A proactive use of IS integration enables more accurate synergy estimation and possibly identification of supplementary synergies (McKiernan & Merali, 1995). As IS integration is a risky and cumbersome process it is an issue that has to be considered early in the process. If not, cost related to IS integration can rapidly overshadow the benefits of the integration. McKiernan and Merali even argue that sometimes relative easiness in IS integration could even be a reason to make an M&A.
BE1: B. Organizational integration – E. Intention and reactions: Resistance among employees may cause integration problems. If one strives for higher degrees of integration, it is not a good idea to have the workforce opposing you. What Buono and Bowditch contributed with was insight that helps understand when and why people are opposing the integration in order to avoid such situations (Buono & Bowditch, 1989).

In chapter 4 the two theoretical domains were integrated, and two further potential relations were found:

BD2: B. Organizational Integration – D. IS ecology: Stylianou et al. (1996) suggested that the IS fit as part of the organizational fit had significant impact on the resources needed for IS integration. They found that differences in the two companies' IS, for example programming language if internally developed, had not only a negative impact on resources needed. They found that determining these differences and taking action upon the information prior to the M&A also had a positive impact, which further strengthens the evidence that IS fit is significant in M&A.
EF1: E. Integration architecture – F. IS integration role: A reactive approach is likely to transform existing systems rather than replacing them (McKiernan & Merali, 1995). If the IS managers are approached with the issue to fulfill an integration need after the deal is closed, the completion of the plans are often time critical as the pressure is high to recapture invested money.

Table 6.2 summarizes the theoretically deduced relations from Chapters 2 – 4.

Table 6.2 Theoretically deduced relations from chapter 2 – 4

Relation	*Description*	*Indicative references*
A. Synergetic potential – B. Organizational integration		
AB1	The degree and mode of integration should be dependent on synergies expected as higher levels of integration is resource demanding. In chapter three it was explained how different kinds of synergies were leveraged by different levels of integration. Leveraging monopoly synergies do not demand integration to the same extent as production or scheduling synergies.	(Haspeslagh & Jemison, 1991)
A. Synergetic potential – F. IS integration role		
AF1	A proactive use of IS integration enables more accurate synergy estimation and possibly identification of supplementary synergies As IS integration is a risky and cumbersome process, it is an issue that has to be considered early in the process. If not, costs related to IS integration can rapidly overshadow the benefits of the integration. McKiernan and Merali even argue that sometimes relative ease in IS integration could even be a reason to make an M&A.	(McKiernan & Merali, 1995).
B. Organizational integration – C. Intention and reactions		
BC1	Resistance among employees may cause integration problems. When pondered, it makes a lot of sense. If one strives for higher degrees of integration, it is not a good idea to have the workforce opposing you. What Buono and Bowditch contributed was the insight that helps understand when and why people are opposing the integration in order to avoid such situations.	(Buono & Bowditch, 1989)
B. Organizational Integration – D. IS ecology		
BD1	Operational integration requires integration of the internal value chain, which requires heavy integration of Transactional IS. Functional integration, in turn, is related to integration of Information IS. The more complex dependency of operational units should make integration in Transaction IS more demanding in terms of resources and time, compared to Informational IS.	(Barki & Pinsonneault, 2005; Weill & Broadbent, 1998)
BD2	Stylianou et al. suggested that the IS fit as part of the organizational fit had significant impact on the resources needed for IS integration. Not only did they find that differences in the two companies' IS, for example programming language if internally developed, had a negative impact on resources needed. They also found that determining these differences and taking action upon the information prior to the M&A did have a positive impact, which further strengthens the evidence that IS fit is significant in M&A.	(Stylianou et al. 1996)
D. IS ecology – E. Integration Architecture		
DE1	If integration of Transaction IS, as suggested, is more demanding and requires deeper coupling than Informational IS, then there are consequences for selection of integration architecture. Integrating a whole operational chain with point-to-point architecture should logically be too complex. In this case a single system, not perhaps a complete Enterprise-wide, but at least some sort of "process wide" architecture can be claimed more suitable.	(Markus, 2000)
DE2	If the IS is business critical, then integrating with point-to-point or middleware could be preferred in favor of an enterprise wide system. Implementing a new enterprise wide system is a highly risky and complicated process. Integrating existing systems is arguably less difficult and risky than a complete transition.	(Markus, 2000)
E. Integration architecture – F. IS integration role		
EF1	A reactive approach is likely to transform existing systems rather than replacing them. If the IS managers are approached with the issue to fulfill an integration need after the deal is closed, the completion of the plans are often time critical as the pressure is high to recapture invested money.	(McKiernan & Merali, 1995)

The preliminary theoretical framework creates the foundation for this study. The potential of the framework lays in the individual value of each dimension and additionally the combined potential to illuminate dynamics and relations between different aspects of IS integration in M&A. Based on the literature review in chapter 2-4, the framework presents six dimensions and sums up IS characteristics and characteristics in the M&A process that could influence each other. What we bring for future use is, apart from the theoretical framework from which the subject of this thesis is studied, five potential relations as described in the existing literature. Together they create the starting point for the empirical work presented next.

6.4 Contribution of Chapter 6

The study presented in this thesis builds upon and tries to extend the accumulated knowledge of management of IS integration in M&A. Part I provides the theoretical fields of IS integration management, M&A, and IS integration in M&A. Chapter 6 has synthesized the fields into one theoretical framework for describing and explaining management of IS integration in M&A. This means that by using the framework it should be possible to describe decisions made and then to explain the consequences of the decisions taken.

The presented framework is highly tentative, presented as a preliminary theoretical framework. The six dimensions (A: Synergetic Potential, B: Organizational Integration, C: Intentions & Reactions, D: IS Ecology, E: Integration Architecture, F: IS Role), and their constituent sub-concepts are directly derived from Chapters 2 – 4. The concepts are included based on proven or deemed potential relevance for explaining IS integration in M&A. In the tradeoff between simplicity and comprehensiveness, the latter has been favored in constructing the framework.

In the next chapter the four case studies of management of IS integration in M&A in which the framework was used are presented. After the empirical material is given, the framework will be reconsidered based on the criteria of explanatory power, distinctiveness, and simplicity as described in Chapter 5.

7. Managing IS integration in four M&As at Trelleborg AB

This chapter present four cases of management of IS integration at Trelleborg AB. The chapter starts with a short introduction to Trelleborg AB, its businesses, growth strategy, organizational structure, and IS strategy. The four cases are then presented according to the dimensions of the theoretical framework.

7.1 Case context: Trelleborg AB

This section presents Trelleborg AB, the target of empirical effort and common denominator for the four cases. The basis for the information presented here is mostly official documents, such as annual reports and the corporate website, complemented by the general interviews described in Chapter 5 and informal discussions with Trelleborg AB employees.

7.1.1 History and future

In 2005 Trelleborg AB celebrated its 100th anniversary. Trelleborgs Gummifabriks AB was registered as a Swedish corporation on October 30, 1905. The operation concentrated on the manufacture of industrial rubber and tires. From having 100 employees and sales of approximately SEK 0.5 M in 1905, the company expanded and by 1935 had some 1,000 employees and sales of SEK 10 M. By 1955, the number of employees had grown to 3,000 and sales reached SEK 125 M. Still all business was national, but in 1962 the Trelleborg Rubber Fabriek was officially opened in the Netherlands, becoming the company's first manufacturing unit outside Sweden. Trelleborg was listed on the Stockholm Stock Exchange in 1964. As revenues weaned, measures were introduced to restructure the company through the sale and closure of unprofitable operations in 1983. When profitability had been restored, an extensive program of acquisitions was implemented.

At the beginning of the 1990's, the Trelleborg Group's operations included mining and metals, mineral processing, the distribution of products for the building sector, and the pulp and paper industry.

During the latter part of the 1990's, the corporation was again restructured. Divestment of operations considered non-core created a strong financial position. In April 1999, the decision was made to follow a new strategic direction and to reposition the Trelleborg Group. The strategy adopted was termed "concentration and expansion" where "expansion" meant that the Group would utilize substantial amounts of its financial resources for external growth. This has meant undertaking acquisitions, such as those of Invensys AVS and LAC, which have strengthened Trelleborg's market position in antivibration components for the automotive industry. In autumn 2003, Trelleborg acquired Smith's operations in polymer-based precision seals which became Trelleborg Polymer Sealing Solutions. A complete list of later acquisitions and divestments are provided in Appendix B.

Trelleborg AB is today a global industry group with 22,000 employees in about 30 countries. Annual sales are of approximately SEK 22.5 billion. The head office is still located in the small Swedish city of Trelleborg, in the very south of Sweden. In 2003 the net profit was SEK 702 million, an increment of 71 %. Major markets are the European and North American markets, with Asia and the Pacific region becoming more and more important. The corporation is now focused towards processed polymer materials:

> The Trelleborg Group offers technological solutions that meet three primary customer needs: to seal, damp and protect to secure investments, processes and people in demanding industrial environments. […] Based on polymer technology and in-depth applications know-how, Trelleborg develops products and solutions designed to meet specific needs, often in close collaboration with customers. (Trelleborg, 2007, p. 8)

Most of Trelleborg's growth in recent years has been achieved through M&As. The growth objective is 8-10% yearly over an economic cycle. For 2006 the business growth was 13%, where 6% was organic growth and 7% was through purchase of additional operations (Trelleborg, 2007). After a period of strong M&A-driven growth, priority has now shifted to complementary acquisitions with the ambition to create synergies. Organic growth is also more emphasized than before. 6%

organic growth was, according to CEO Fredrik Arp, a very satisfying result (Trelleborg, 2007).

7.1.2 Structure and business areas

Trelleborg AB consists of a central group management function and five distinct Business Areas (Figure 7.1). Each business area has its own profit center and may from some perspective be regarded as individual organizations. Each business area has its distinct corporate culture, its way of doing business, its unique costumers and its own IS. Comparing the five business areas, Trelleborg Automotive (TA) is the largest, both in terms of employees and net sales (Figure 7.2). They follow hereafter in named order: Trelleborg Engineered Systems (TES), Trelleborg Wheel Systems (TWS), Trelleborg Building Systems (TBS), and finally Trelleborg Sealing Solutions (TSS).

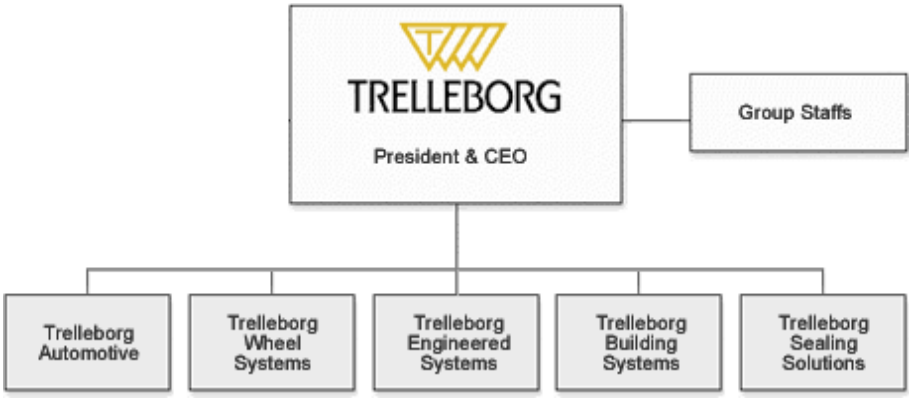


Figure 7.1 Structure of Trelleborg AB

Previous and expected growth is not equally divided between the business areas. TES and TSS are the two areas that have been considered as having greatest potential for the future and, logically, the fields in which growth has been concentrated. It is also from these business areas that the four cases are presented in the following chapters; naturally, this presentation will tilt substantially towards these areas. However, to understand the implications of the cases on the group as a whole, it is also necessary to introduce the other business areas, their activities, and their use of IS.

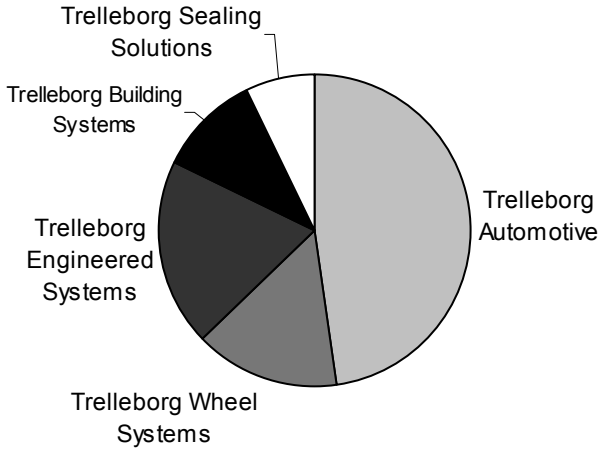


Figure 7.2 Division of net sales per BA (Trelleborg, 2003)

7.1.3 Trelleborg Engineered Systems

TES is a global supplier of industrial fluid systems and engineered solutions that focus on the protection and safety of investments, processes and individuals in demanding environments. The business area comprises two business segments: Industrial Fluid Systems and Engineered Solutions. Industrial Fluid Systems develops manufactures markets, and distributes industrial fluid systems, such as hose systems and elastomer laminates in polymer materials for advanced applications. Engineered Solutions, with operations that are project-oriented and focused primarily on infrastructure and offshore oil and gas applications, provides engineered solutions in polymer materials. Examples include marine fender systems, support bearings and expansion joints for bridges, tunnel seals and niche products for the offshore, oil/gas extraction sector. The head office is located in Trelleborg, Sweden. Major production units are located in Sweden, Norway, the UK, Germany, the Netherlands, France, Spain, the US, Canada, Singapore and Australia.

TES is a highly decentralized and heterogeneous business area. It consists of a set of mainly self-managed business units that form individual companies. The business units are specialized in their areas, and generally have few customs or suppliers in common. The TES management considers the units themselves to be best equipped to understand the needs of their costumers and how they should be met

efficiently. Despite the relative freedom of the business units within TES, major decisions such as larger investments or changes in offering must be approved by TES management. This includes M&As, which sometimes are initiated and entirely managed by the individual business unit. M&As can also be initiated by TES on a business area level and then managed by a project group set up at business area level.

7.1.4 Trelleborg Sealing Solutions

Most of Smith's operations in polymer-based precision seals took place after the purchase integrated into Trelleborg AB as a new business area and named Trelleborg Polymer Sealing Solutions, which later was altered to Trelleborg Sealing Solutions (TSS). TSS is a global supplier of precision seals for the industrial, automotive and aerospace markets. For the industry, this business area offers sealing solutions in specialty materials for a range of applications. For the automotive industry, TSS produces security-critical seals for application areas such as steering, fuel control, air conditioning, air induction and driveline systems. TSS also produces aircraft seals that are used by aircraft manufacturer in engines, flight controls and actuators, landing gear, airframes, wheels and brakes. Most of the products are marketed under the Busak+Shamban label. The head office is located in Stuttgart, Germany. Production units are located in Brazil, Canada, Denmark, France, India, Italy, Japan, Malta, Mexico, Poland, Sweden, the UK and the US. Geographically, TSS is organized into three regions: Europe, which is still the main market with a 70% share of total revenue, as well as the Americas and the Asia Pacific which together make up for 30%. The organization is divided into three distinct business units for marketing, logistics and sales.

TSS is marketing driven and aims to compete with a value-added offer of quality and high technology, rather than cost. Industry trends point to where customers demand holistic solutions and aims at reducing the number of suppliers (Trelleborg annual report, 2005); the business model of TSS is solutions oriented. This means that TSS salesmen and application engineers meet up with customers, discuss and analyze their specific sealing needs and then come up with a solution that caters to this. This business model is supported by an organizational structure that distinguishes between Marketing, Supply-chain (or Logistics) and Manufacturing activities, which can be seen in Figure 7.3. The solutions proposed by the marketing units may involve

in-house manufacturing, but products may also be procured from third party suppliers, or even competitors; the number of goods purchased through this channel is said to be as high as 30-35%.

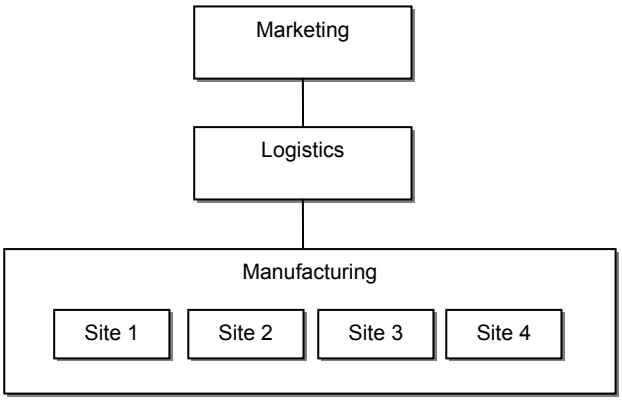


Figure 7.3. TSS Business Activities

According to Windahl et al. (2004), the modern solutions-oriented company should seek to re-evaluate their internal competence and move core competencies from production and technical applications, such as production, to marketing, consulting and integration competencies. In practice, this means that solutions-oriented businesses place less emphasis on their production and more on consulting and the ability to integrate vertically with customers and suppliers. Windahl et al. (2004) also confirm the need to develop systems integration competence within the solutions-based company.

7.1.5 Trelleborg Automotive

Trelleborg Automotive (TA) manufactures polymer based components and systems used for noise and vibration damping for passenger car, light truck, heavy truck, rail, marine and industrial applications. With net sales of SEK 8,721 million, TA is the largest of Trelleborg's business areas. It is also the largest business in terms of employees, that is, 8,487 employees. TA comprises two business segments: Antivibration Systems and Fluid & Acoustic Solutions. The first segment produces noise and vibration solutions to the automotive industry. The latter segment supplies the car and truck industry with engine cooling, air supply and acoustic management systems. TA's head office is located in South Haven, Michigan. Major production units are

located in Brazil, China, the Czech Republic, France, Germany, India, Italy, Mexico, Poland, Slovakia, South Korea, Spain, Sweden, Turkey, the UK and the US.

7.1.6 Trelleborg Wheel Systems

Trelleborg Wheel System (TWS) is the second largest business area of Trelleborg, with its SEK 2,704 million in net sales and 2,118 employees. The two business segments Agricultural & Forest Tires and Industrial Tires manufactures and distributes tires and wheel systems for tractors, farm machines, forest machines, transport vehicles and other utility vehicles. The head office of TWS is located in Rome, Italy. Production units are found in Denmark, Italy, Sri Lanka, Sweden and the U.S.

7.1.7 Trelleborg Building Systems

Trelleborg Building Systems (TBS) is a supplier of polymer- and bitumen-based building products for sealing and waterproofing applications in the industrial and consumer markets. TBS comprises three business segments: Sealing Profiles who develops, produces and markets sealing products for the construction sector and other industries, and sealing strips for the consumer market; Waterproofing Systems who supplies bitumen- and rubber-based products for waterproofing and protection applications in the construction and civil engineering sectors; and finally Pipe Seals who produces sealing systems for concrete and plastic pipes. The head office is located in Trelleborg, Sweden. Production units are located in Sweden, Denmark, Poland, Germany, the UK, Finland and Spain.

7.1.8 IS at Trelleborg AB

Trelleborg AB has on a group level a central function addressed to IT, called Group IT. This function is lead by the CIO who reports to the CFO. Group IT tasks are mostly related to alignment of IT issues, such as security, central negations on hardware and software purchase, and strategic IT development projects concern group level, for example Intranet, Extranet, B2B integration and systems integration. Together with IT managers from the five BAs, Group IT forms the IT-forum

with quarterly meetings to exchange experiences, information and knowledge.

When describing the flora of IT-systems, CIO, Peter Andersson, expresses it as "You name it, we got it" (PA, 050120). Regarding IT, this is very true for Trelleborg, being a decentralized organization. Each business area is practically in charge of its own IT architecture, ERP-system strategy and IS. TA, TBS and TSS have implemented the same ERP system in all business units, while TES, TBS, and TWS may have a distinct ERP system down to the factory level. For example, TBS has implemented the ERP system, Movex, in all its business units. TES is the less homogenous business area at Trelleborg. According to CIO, Jan T. Pettersson, they do not consider there be any enhancements with one single ERP system, as its business units to a high degree have distinctive costumers and separate work processes. Costumers do not demand the business area to provide one single face, but rather have highly specialized ways of doing business.

Decisions on IT architecture are made on the group level. Trelleborg has chosen IP-based networks and CIO, Peter Anderson, wants to deploy Microsoft Active Directory, a desire that has met resistance as some BA want to keep their functional Novell solutions. Lotus software portfolio is used for communication and Microsoft Sharepoint Portal tends to be given a more and more important role as a portal solution. The portal project is one of the major IS projects on the group level. Other projects on the group level are related to systems integration and the leverage of synergies following the acquisitions.

During the time of the four cases presented in this chapter, there was a shift in IS management on the group level. In 2004, current CEO, Fredrik Arp, hired Peter Andersson as the CIO, reporting to CFO, Bo Jacobsson. Peter Andersson was not a part of Trelleborg Group Management. Fredrik Arp resigned in 2006 and was replaced by Peter Nilsson, who in 2006 had already created the position of Senior Vice President with responsibility for IT. It was the first time that Trelleborg included responsibility of IT in the group management. Peter Svenburg, previous CIO at Scancem/Heidelberg Cement, was hired for the job. Although this strengthening of the role of IT at Trelleborg is likely to have impact in the future, the change did not have any impact on the cases presented in this thesis. First, at the time that Peter Nilsson and Peter Svenburg had settled into their offices all four cases had progressed far into their integration projects. In addition,

the four M&As were, as will be shown in this chapter, foremost the concern of the individual business areas. The Trelleborg group level had almost nothing to do directly with the four M&As, even though general group-wide policies had a limited impact, as will be explained later.

More information on Trelleborg AB is available at:
www.trelleborg.com

7.2 Case A: Kleber

As described above, Trelleborg adopted a strategy termed "concentration and expansion" during the first half of the 1990's. Divestment of operations considered non-core created a strong financial position. "Expansion" meant that the Group would utilize substantial amounts of its financial resources for external growth. As one constituent part of the new strategy, Trelleborg AB purchased CMP/Kléber Industrie from the French Michelin group in 1996. CMP/Kléber Industrie (henceforth referred to as 'Kléber') had its base in the middlesized French city Clermont-Ferrand with its major manufacturing site located just outside the city in the industry area called Palport. Clermont-Ferrand is known to the public as "the rubber-city of France" with business, community, as well as social life dominated by the Michelin group.

Kléber and the corresponding unit from the Trelleborg group was organizationally joined in the new company, Trelleborg Industrial Hose (TIH), within the TES business area. As the new unit's name implies, the business was industrial hose. Today TIH targets two product categories: oil and marine hose, and industrial hose. In financial terms, the formation of TIH was a pure acquisition, a purchase made by the Trelleborg Group. On the other hand, the consolidation, from an organizational point of view, actually had many characteristics relevant to a merger of equals. These characteristics will be discussed further when presenting the dimension of organizational integration.

The Kléber integration that took place in the ten following years will in this section be presented using the framework introduced earlier. As explained earlier, the objective of this case study was to verify the framework's consistency and ability to test existing theory as well as to

generate new theory regarding the relationship between M&A and IS integration.

The case will be described according to the same disposition as the theoretical framework in order to facilitate for the reader to follow the process from empirical data to final conclusions. A summary of findings in the case can be found in Table 7.1.

7.2.1 Dimension A: Synergetic potential

The two companies involved in the consolidation were potential competitors although not present on the same markets, meaning that the M&A was primarily a market extension. Whereas Trelleborg had a strong market position in the Scandinavian countries (but weak in the rest of Europe), CMP/Kléber Industrie had a strong position in France, Italy and Southern Europe. It was expected that some of the two companies' products that were in direct competition would be produced jointly, thereby enabling larger volumes with the resulting lower production prices per unit (economies of scale). For those products that were not in direct competition, it was estimated that the combination would open up new markets and thus generate greater sales.

> In terms in products, the two units' (focusing only on hoses), product programs was very comparable. Program was a little bit shorter in Trelleborg. Overlapping was limited in geographical terms. Trelleborg was more nordic, more nicsh. Kléber was more latin, more generalist, more distribution. Basically, the companies were only competing in Germany in the same nisch (PP, 051019).

If scrutinizing the potential synergies, this M&A was mostly driven by technical economies. Expected synergies were to be found, and in the end also leveraged, in marketing, experience, production, and scheduling. However, all synergies that had been reached during the ten years after the M&A cannot be attributed to the consolidation of the former Kléber and Trelleborg units. Significant portions of the synergies came from integration of previously more or less isolated units within the two companies. For example, whether both companies possessed national sales organizations, which in many cases had accompanying warehouses and individual logistics. Due to changes in legislation, it became possible to consolidate the sales organization into

one centralized function. Until about 2000 it was simply not possible to have one invoicing company in Europe. National legislations enforced national sales offices.

> In 1998 it was decided that we should have only one invoicing company. Until then we had one company in each country where we did sell our products and almost every country had its own management, warehouse, infrastructure, ERP system and so on. We decided that we would only have one center, in Clermont-Ferrand (AG, 050714).

The effect of the consolidation initiative in which national sales offices were joined into one European invoicing company was, of course, greater since there were more national offices in the combined TIH unit than there would have been in the two companies individually. This also enabled synergies in logistics and centralized warehouses. Exactly how much of the savings and quality improvements directly related to the M&A is impossible to say.

> What we decided when I started in 1999 was to change the organizational structure completely. Within 6 months we had changed the picture completely. We decided at that time to have a new chart with one logistics manager reporting to me in Sweden, one logistics manager reporting to me in France. One purchase manager for both, one IT manager for both. That was perhaps the first time we crossed the former organizational borders to have common functions independent of location. It was completely different from having one split responsibility at the two sites. […] For everything we have done we have made investment requests and calculated on the ROI. I think all together I have written 15 investment requests for the business area management, but these were for specific change projects that only partly had to do with the consolidation of Kleber and Trelleborg (AG, 050714).

Regarding pecuniary economies, the increase in size was marginal. If considering the relation to suppliers, Trelleborg had already acted as a group on the factor market and also had formed a joint purchase organization with other Swedish industry groups to further profit from scale advantages towards suppliers. The increase in volume added by Kléber was thus marginal. Kléber, in turn, switched from the Michelin sphere, and neither of their activities experienced any savings in pecuniary economies.

As Kléber was active within the same industry as Trelleborg was already present, the purchase did not imply any diversification in terms of products. Regarding geographical markets, the two units complemented each other as their strength was heterogeneously spread over Europe (North vs. South). However, with increased globalization, companies within the business of TIH define the European market as one market, which is also manifested in that TIH has implemented one common sales organization and one invoicing company for the whole continent. To fully understand why Trelleborg thought that Kléber was an interesting target, it is important to understand the Hose market at that time. The hose business of Trelleborg was not doing very well, and it was not self evident to try to develop business in this market.

> Trelleborg was at this time beginning to move towards a core business. It was not evident that hose should be a part of the focus. Trelleborg's hose business was not very exiting. Very limited in scope and not profitable. Therefore it could be questionable to grow... on the other hand, it was obvious that the hose-market was fragmented and relatively unstable. Some big and poor companies, some big and profitable. Some nisch, some focused, some big in volume and so on. Therefore it was attractive, in these circumstances you can act. It is not that you enter a nisch and then play the game. This freedom was attractive. (PP, 051019)

Kléber was also an interesting target for the reason that it was possible to be developed by the right buyer. It had for a long time been underinvested, and the current owner, Michelin, to some extent, had their hands tied due to their position in the community of Clermont-Ferrand.

> Kléber had strong market share in some key countries. […] Kléber was not profitable due to lack of management support. Not realizing the potential of the market position. (PP, 051019)

> Kléber was underinvested. Many investments were needed investment by Trelleborg. Optimization decisions were not taken, since Michelin could not take optimization decision. A certain number of actors could have helped Kléber. What was needed was a capability to respect the knowhow combined with a strong management drive. Money and time was the key in order to be able to respect knowhow and allow time for changes. You need certain knowledge of how hose manufacturing work. […] A lot of competitors visited Kléber before

> Trelleborg and said no. Trelleborg was very good in negating the conditions. (PP, 051019)

7.2.2 Dimension B: Organizational Integration

Haspeslagh and Jemison (1991) proposed a differentiation of integration in M&A into four categories: holding, preservation, symbiosis, and absorption. Regarding the initial post-M&A strategy plans, the objective at Trelleborg was to make an absorption, but the final outcome would turn out to be a symbiosis. To leverage the anticipated synergetic effects, the two independent units needed to be integrated, and it was decided to create a new unit within the Trelleborg group consisting of the acquired CMP/Kléber Industrie and the corresponding unit from the Trelleborg group. The new business unit was named Trelleborg Industrial Hose (TIH). As Trelleborg was the acquirer, a Swedish management team was installed and Swedish business practice was introduced into the new unit. For example, it was decided that the IT systems at the old Kléber unit should be replaced by the systems used in Trelleborg. But, although the Trelleborg group was substantially larger than the Kléber unit, the relation was the opposite within TIH. Whilst 600 persons worked at the old Kléber site at Clermont-Ferrand, only 200 worked for TIH in Trelleborg. Also, some production was transferred to Clermont-Ferrand to fully profit from the scale advantages. In 2005, the management team was based in France, consisting of only originally French people. As a consequence, the integration became more oriented towards the idealized symbiosis type, rather than the absorption that was planned for.

> Between 1996 and 1999 there were basically no changes in terms of integration. A lot of planning but only marginally implemented in reality. When the new manager, Christian Caleca, arrived by the end of 1998 he decided to recruit a new management team of which I became part. We had one small factory in Trelleborg and a big one in Palport. And at that time we had 11 stock locations, one stock location in each country. And at that time we had 7 ERP systems. On top of that we had 11 companies, one for each country. What we decided when I started in 1999 was to change the organizational structure completely. Within 6 months we had changed the picture completely. We decided at that time to have a new chart with one logistics manager reporting to me in Sweden, one logistics manager reporting to me in France. One purchase manager for both locations,

> one IT manager for both. That was perhaps the first time we crossed the former organizational borders to have common functions independent of location. It was completely different from having one split responsibility at the two sites. (AG, 050714)

As a first step towards consolidation, the previously independent organizations, Kléber and Trelleborg, were consolidated independently. After a first phase of amalgamation, the organizational chart was drastically changed.

> In 2001 we had suppressed the local warehouses in the north of Sweden, Norway, UK, Belgium, and suppressed the legal entities in UK, Belgium, Switzerland, Italy, Spain. All businesses should work within the same system. At that time we kept Germany… Sweden we had merged with Denmark. Basically we had two warehouses then.. some 4000 pallet places in France and some 6000 in Sweden. In Germany we had about 200. We decided to keep this warehouse because we had, and still have, a local workshop in order to make assembly. We have small workshops in Sweden, Norway, France and Germany for assembly and we always have to have parts for them in stock nearby (AG, 050711) .

In order to leverage the anticipated synergies in marketing, production, experience, and scheduling, many activities of the two units had to become integrated. Some marketing and scheduling activities related to production (including logistics) and sales in pooled relationships; however, the dominating relationship type was sequential as the integrated units were operational rather than functional. Functional units included, as mentioned above, marketing and management (which relates to the scheduling activity), but also HR, general management, product development and business intelligence. One reason for the suppression of local warehouses being possible was due to the development of logistics within Europe and related cost decreases for transportation within the EU. In addition, tradition and culture had led to unnecessary warehousing and overhead.

> I think the reason for local stocks was mostly cultural. At the end of the day he was a sales manager, he wanted to have stock. The consequence was that we had trouble to deliver one product the local sales managers would place more orders to make sure they had their products in stock… then the problem became even more critical. The problem was to explain to these persons that they would be sales

> managers… they said in the beginning, that's why it took almost two years… that it was impossible. To invoice a Italian, Spanish, German customer from France. But every local manager said the same... and 6 months after the implementation they all said that finally it was not a problem for their customers. I think it was a cultural issue and an issue of wanting control over the business (AG, 050715).

The change from absorption to symbiosis did have effects on how the IS were integrated. The two first years when TIH had a Swedish integration management, projects were carried out by Swedish people, who in large project groups tried to reach consensus in important decisions. Swedish suppliers were most often chosen. After 1998 when the new management team was installed both the way of managing and the preferred way to do integration changed.

7.2.3 Dimension C: Intention & reactions

Describing the M&A process in terms of Buono and Bowditch's (1989) intention typology is somewhat difficult, as the process includes elements that are typical for at least three of the categories. In 1996 the Kléber unit was struggling financially. One potential outcome of the minor crisis was a closedown of the factory. Regarding the purchase from that viewpoint, the appropriate category would be "Rescue."

> It [Kléber] was ill. Very ill. (PP, 051019)

> Trelleborg was the preferred acquirer among the employees. The people knew it was for sale. Maybe it was because of a nice image of Swedes, I don't know… but Trelleborg was preferred to the other alternatives of Austrian, German, or Italian owners. Trelleborg was expected to bring vision and investments. (PP, 051019)

However, after a short honeymoon, things got a little rougher. Sure, Trelleborg did bring investments but did also rationalize and put additional workload on the workforce.

> There was a small disappointment… "Trelleborg is putting money in yes, but we are working harder, no salary increase, results are not good…", the saying went. Long term it was good, short time it was harder. (PP, 051019)

What is also to know is that the financial situation was equivalent to the Trelleborg site. Discussion before the deal was about either divesting the unit or investing and trying to make it profitable. Regarding what Buono and Bowditch (1989) said would trigger the "rescue"-reaction, it is very likely that this may have affected the post-M&A integration process. Trelleborg was not a profitable company coming to rescue with superior knowledge on how to do the business. Rather, both companies were at same level and needed a new strategy. Therefore, the most appropriate category to sort the M&A into would be "Collaboration." However, as the two units were directly interchangeable in many aspects, a natural contest and rivalry between the two sites emerged. A characteristic that is typical for the category of "Contested Combination." When the location of TIH management then was transferred to Clermont-Ferrand in France, the increased anxious at the Trelleborg site was natural:

> In Trelleborg the management had always been close to the people. With the new unit center in France… it is always a question how much such a management cares. In addition, compared to the Trelleborg site, the site in Clermont-Ferrand was so big… (PP, 051019).

This natural rivalry between the two units has been prevalent in all IS integration projects and thus has become a management challenge. The intention is related to all of the prior dimensions. For organizational integration, the turn from rescue to collaboration is parallel to the change from absorption to symbiosis. Further, the collaboration is reflected in the choice of IT integration architecture and the priority shift in IS functionality.

The TIH unit has, partly due tothe synergies created in the consolidation, managed to turn red figures into profit, saving the two production sites from closure. This is well known within the companies and has limited the reactions. Overall, the turnover rates were low; at least in retrospection the story goes that the companies managed to keep key employees as long as they desired. As mentioned above, the management was replaced in 1998 when the temporal management installed at the time of the purchase stepped down. However, overall turnover rates were low and TIH managed to keep key employees in the new organization.

7.2.4 Dimension D: IS Ecology

During the 10 years that have passed, the deal integration efforts have been directed towards three out of four kinds of IS to a different extent. The first idea was to keep business as more or less the same way as it was and implement a Movex-system that basically let the people work exactly the same way as before.

> If you look here [showing a requirement specification for the system] it is a detailed description of what everyone was doing already. The people providing input for this had never worked with the system themselves, the only thing they knew what that they wanted exactly the same as they already had. It was a lot of work, a lot of meetings between country manager and everything managed by Intentia. Reports were also written by Intentia. The Trelleborg people were not really involved in the details. The only idea was to have the same as before. (AG, 050714)

When the new management was installed in 1999, the first two years basically had nothing to do with IS integration but was an organizational change project, according to the IS manager. The objective was standardization and simplification, to make sure that TIH was working in the same manner everywhere. The basic idea was to suppress the 'at that time' existing country-specific ERP systems and put all activities into the ERP in Clermont-Ferrand. At a first stage during 1999-2001, it was mostly the countries in the South of Europe that were affected by these developments.

> In 1999 we decided to start our unity project. We made this pamphlet in Swedish, English, and France… and we sent it to every employee. At that time we gave some information of what we wanted to do with this project. Simplification and visibility. The idea was not to link everything, to put e-business on top of all. The idea was just to simplify everything and to have the full visibility of our business unit. In this setup it was very difficult to know the activities in the organization… with 11 companies… 7 ERP systems… products had different prices in the stock locations and so on… so when we talked to the German manager he could say that one business was good, as he calculated on the local margin… but when we calculated on the integrated margin for the whole of the unit it was a bad business in which we lost money (AG, 050714).

Changes in the IS Ecology at TIH has been direct consequences of what the management wanted to do with the company. IS were described as tools for doing business.

Infrastructure – Very little new infrastructural IS has been developed to facilitate the integration. The transformation of national companies into sales centers demanded more communication within the organization and also more elaborated IS infrastructure. However, the IT needed to do so already existed within the Trelleborg group. From a TIH perspective, it was more or less just a matter of plugging in the cables and making a phone call to achieve the communication line.

Transaction – Transaction IS were one major integration focus. The new organization as well as the joint production where the two production units should be used more efficiently demanded more transactions between the different parts of the organization. As explained above, this was essential to leverage the synergetic potential of the deal and was solved with the enterprise-wide system. As explained above, integration of transaction IS received higher priority when managers that were more deeply involved in the daily business became in charge of IS integration activity.

Informational – Information oriented IS was not a primary target for the integration activities that had been undertaken. However, some functionality came automatically with the new enterprise-wide system, for example, delivery times and detailed sales figures. In addition, a number of minor projects were initiated in order to increase the visibility further, for example, use of production facilities.

Strategic – TIH, and the formerly independent units, did not possess strategic IS.

7.2.5 Dimension E: Integration architecture

The Swedish management team installed after the purchase faced a rather complex IT infrastructure. The Clerment-Ferrand site had an in-house developed ERP system, called Bergounix, which was running in all the different countries where CMP/Kléber was represented by sales organizations where individual ERP installations found. The former Trelleborg part of the unit used the ERP systems Movex, from Intentia (since 2006 a part of Lawson Software) in all countries, but also here every country had in reality its individual installation of the system. The decision was made to replace all Bergounix installations with

Movex installations. Although these new systems would all be Movex systems, it was not one single system being implemented, but rather seven different implementations since management wanted to support individual requirements at each site. Different strategies, including both point-to-point and middleware solutions, were considered for integrating the systems. After all country managers had been questioned regarding the new systems functionality requirements, consultants from Intentia along with Trelleborg employees calculated the efforts needed to implement the new systems. The result was some 1000 consulting days.

The date when these cost calculations were made was at end of 1998. At the same time a new French manager was hired who reorganized the management team and installed a number of new persons at key positions. Together they decided that the proposed development of a new system would be too expensive, but also too risky considering that the existing Bergounix system would not make it through the Y2K-problem. The new management decided to modify the existing system in order to survive the millennium shift and search for other options.

> At the end of 1998 they arrived to the conclusion that it would take about 1000 working days to implement the outlined Movex system, to make the specific development on top of the standard system. When then the new manager arrived in the end of 1998 he said… "1000 days just for the specific development…". It was too much. It couldn't be motivated with future savings. In addition it was the problem that the existing system would not make the year 2000 problem. At the end it was decided to take people from the outside to fix the old systems, just to pass the shift to year 2000. (AG, 050714)

In 1998 TIH continuously struggled with excessive losses and weak sales. Therefore, the management team decided to reorganize its sales structure. Instead of having individual sales-companies with individual stock locations (ERP installation, book keeping etc.), in each country where it was represented, it was decided that only one invoicing company would exist and only three stock locations should exist. National companies were transformed to sales organizations. In order to achieve this new organizational structure, national centers needed to be fully integrated with the stock locations, production facilities and logistics departments. It was thus decided to eliminate the national ERP

installations and make them use the same systems as was used in Clermont-Ferrand, that is, the modified Bergounix system. Later on the Bergounix system was replaced by a Movex installation in the "Unity" project with the aim of having one way of doing business in the whole company: one invoicing company and one supporting system. The Bergounix system never became an enterprise-wide system. It was enterprise-wide in the old Kléber unit, but former Trelleborg parts were never included in that system. However, during 2005, the old Trelleborg factory also switched from one individual Movex installation to using the enterprise-wide system; 10 years after the purchase the new unit had become integrated in terms of IT system.

> In 2001 we had real problems with the infrastructure and IS. At that time we decided to start the "Unity" project, from 2002 to 2004. It was based on the concept for the business unit to have only one invoicing company, and one IS. In 2001 we then had to decided with system to use… if you look at the picture of IS at that time we hade Movex, Movex, Movex, Movex, in almost all the places. Not the same Movex. Not the same implementation, not the same parameters, but nevertheless the same Movex. Here in Palport we had to do something… since the system was built inhouse we had no possibility to add an e-business module or a supply-chain module to optimize and so on. So at that time we said we had to replace the Bergounix system. We decided to buy a prestudy, comparing Movex to the other standard packages available. The study compared the functionality of the packages. SAP, Oracle, JD Edwards… The idea was just to check if Movex was extensive enough compared to the others. I had experience from another package which I had implemented before and wanted to know how Movex was doing compared to that one (AG, 050714).

> The Unity-project was not at all about linking different ERP, but to have only one ERP for the whole business unit. Now when we speak summer 2005 only one country is not included yet, Norway. And that is basically because almost everything for the Norwegian market is dispatched from Sweden even without including Norway we have full visibility. Norway can wait until there is a need to replace the systems. In Norway we still have the legal issue, it is very hard to invoice from an EU country so we can't suppress the national company. We will certainly integrate Norway, but Norway has to be an individual company in our Movex system (AG, 050715).

The relation between the change in general integration approach, from absorption to symbiosis and IT integration architecture, is apparent, but the question is "why." Our interviews provided insightful information that contributes to that question being answered. While the Trelleborg group was trying to complete an absorption, they were focusing on IS functionality other than that which the new French management did. The group management did, to a higher degree than the TIH management, focus information flows vertically in the organization. On the other hand, the French TIH management had the TIH unit as primary horizon and for the more deeply involved daily business, they considered to focus on the transaction IS.

7.2.6 Dimension F: IS integration role

The second process oriented dimension is adapted from McKiernan and Merali (1995). The authors argue that an important distinction to understand IS integration in M&A is whether IS integration is a post-M&A issue, dealt with reactively, or an early issue on the agenda, used proactively to maximize chances for positive outcome. McKiernan and Merali (1995) suggest that IS integration should be used proactively rather than reactively in M&As, meaning that it should be a pre-M&A issue rather than a post-M&A issue. In the TIH case, there is no doubt that IS integration was a post concern, which also led to some problems directly after the deal when the management had some difficulties finding the right integration mode. In this case it did, however, not turn out to be a deal-breaker that could have stopped the process, but it was easy to see that the integration could have been smother if the units had been better prepared.

After the deal was settled in 1996, the company had to start making an implementation plan for the integration. The first project that had started in 1996 and was subsequently cancelled in 1998 had come a far way before it was stopped.

> The first project started in 1996 and had reached so far that all processes were modeled. As I understood, there was much problem with the consultants. The relations between Trelleborg and Intentia was not the best at that time. I believe it was not only technological problem but also to some degree communication problem. We decided to restart the project in 2001 with a different scope (BM, 061120).

When the project started there was a different approach to steering the project. TIH said that they learned from the first project not to be too dependent on external consultants, but rather to have the competency in-house. To the extent that consultants were used, it was not for such things like project management or requirement specification.

> We wanted to keep all our knowledge inside. Myself spent at least two days a week in the same room as the consultants, really building the system together with them. In this way I could fully understand the system and have the whole picture. I would say that we have changed the way to look at IT in the company as I am also responsible for the production sites.
>
> We have some people here with more knowledge than the consultants. We have the right setup now and can stay with this setup for years. If we have to replace by something else, we have only one system to replace. When we merged into one system we did the standardization, transferring products, customers etc into one system. Now the conversion into another system would be comparatively smooth.(AG, 050714).

As the role of IS integration had been reactive the IS integration efforts changed along with the other dimensions. As the management changed, so did also the desired IS integration. The integration objective evolved to support business objectives, for example, the above described rationalization of national companies to sales organizations.

7.2.7 Summarizing the Kléber Case

Summarizing the Kléber case there were two major events that transformed the M&A integration process. First, after the new management was installed in 1998 a new era began at the company. This was manifested in the second important event, the decision to centralize and homogenize the organizational structure. This decided the agenda for which IS needed to be integrated and, in turn, which architecture was required. In a general way, Table 7.1 depicts the discussion of the dimensions in a categorical view.

Table 7.1 Six dimensions of IS integration in the Kléber case

Dimension	*Description*
Synergetic potential	
Technical economies	Marketing, production, logistics, experience, scheduling
Pecuniary economies	Limited
Diversific. economies	Limited
Organizational Integration	
Interdependency type	Pooled and sequential
Degree of Integration	Symbiosis
Integrated Activity	Functional and operational
Intentions & Reactions	
Friendliness/Hostility	Collaboration, Contested Combination
Reaction	Low
IS Ecology	
Infrastructural	Extensive
Transactional	Extensive
Informational	Moderate
Strategic	Low
Integration Architecture	
Integration level	Organizational
Integration structure	Enterprise-Wide
IS integration role	
Proactivity	Reactive

7.3 Case B: Dynaflex

The second case in this empirical account further elaborates upon the first case. The purchase of Kléber/CMP led to the creation of the TIH unit. This second case was a purchase by the consolidated TIH unit and this second case tells the story of how TIH acquired and integrated the highly niched company Dynaflex.

The small hose manufacturer Dynaflex with production facilities in Sancheville, France, addressed a small niche of the hose industry with focus on products for the oil and petrochemical industry. Dynaflex produced, and still produces, hose in composite materials. Typical applications were tanker-truck hose, aviation-fuel hose and hose for aggressive chemicals. The unit was considered technologically relatively advanced and specialized. Dynaflex has had a relatively turbulent life since its foundation. Former Dynaflex employees decided in the late 1990's to set up their own manufacturing line and become one of Dynaflex's major competitors in the new company Unifluid. Unifluid was acquired by Trelleborg AB in 2003 and the Trelleborg representative saw the potential of joining the former colleagues of Dynaflex and Unifluid under the same roof in the Trelleborg family. Organizationally, the acquisition was driven by the Trelleborg

Industrial Hose-unit - the unit created after the purchase of Kléber/CMP. Figure 7.4 displays the organizational progression of Trelleborg, Dynaflex and Unifluid.

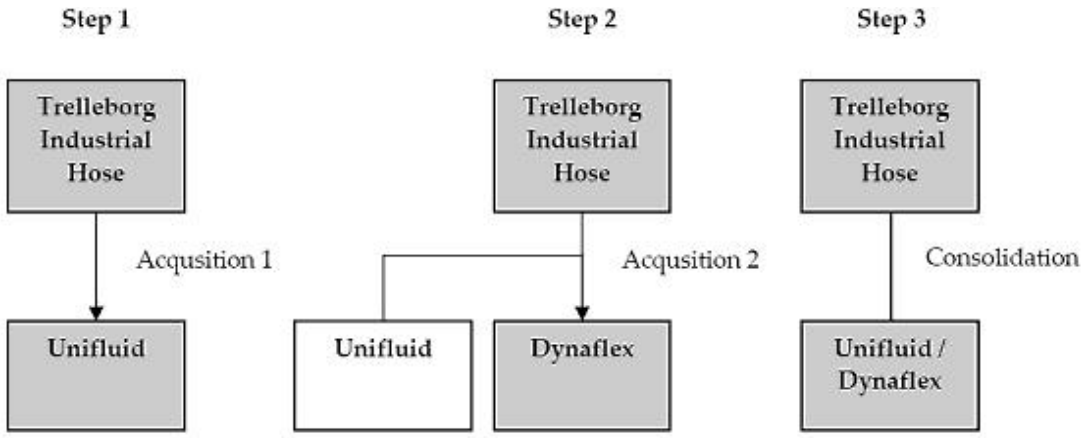


Figure 7.4 The organizational progression of Dynaflex, TIH and Unifluid

The universe of European hose-manufacturers is fairly graspable with a limited number of producers. The different actors are no strangers to each others. At the time of 2004, Dynaflex was owned by the Italian industry group, Manuli, and although a successful operation, not at the group's core business at Manuli. For various reasons, further elaborated upon later in this case description, Trelleborg and Manuli agreed that the business could be further developed by Trelleborg and the deal was settled in March 2004.

Compared to the previously described M&A and integration of Kléber, this case presents a fundamentally different story, not the least because of the fact that the desired level of IS integration was achieved after 3 months – not 10 years. The story, just as in the previous case, depicts using the framework for IS integration in M&A.

7.3.1 Dimension A: Synergetic potential

As mentioned, Trelleborg (represented by the TIH unit) and Dynaflex were both in the hose manufacturing business and geographically close to each other with major production and managerial centers in the middle of France. The market was somewhat overlapping in

geographical terms, but the bases of customers and products were mostly different. Whereas TIH had a wider range of hose offerings, Dynaflex was a smaller niche player specialized in composite hoses for the oil and petro-chemical industry.

> At the point when the deal was struck Trelleborg did only buy products from Dynaflex. Now both sides are both buyers and sellers of products to one another. There were no competing products. Or, as we bought Unfluid there was, but this more or less a part of the Dynaflex case (BM, 061120).

> The aim was not to acquire a company that was already full flourished and working well but rather to see future potential and to develop the company and introduce its products in new countries. For example we have introduced Dynaflex products in the U.K. where Dynaflex previously did not have any business (AG, 061213).

In order to produce this composite hoses, Dynaflex could potentially use hose manufactured by TIH, but this was not the actual case. TIH was also a potential customer of Dynaflex products as to complement their own offering towards their customers.

> Dynaflex had two activities. One was manufacturing of hose. Another was assembly, to take other types of hose that they bought from elsewhere and prepare them for use at gas stations. In this activity they could have used Trelleborg hoses but were not doing that. There we did see a potential (BM, 061120).

With the purchase of the Dynaflex spinoff Unifluid, TIH had products directly overlapping with the ones of Dynaflex. In specific terms, Dynaflex had two production lines and the Unifluid one that basically could be used to produce the same products. The M&A thus included aspects of both vertical, market and product concentric acquisition. Vertical in that Dynaflex was a potential buyer of TIH's products. Market concentric as TIH, it did offer products on the same market, although not directly competing. Product concentric as the recently acquired Unifluid unit and Dynaflex did have overlapping product portfolios that could be produced with the same procedures. There was thus a great range of synergetic potentials that logically should be possible to leverage. Synergies that were not possible between Dynaflex and its former owner, the Manuli group.

> Manuli was not specialized in composite-hose. Their specialty is hydraulic hose. Basically, within the hose business these are two different markets. Hydraulic hoses are for high pressure application and composite hose is for low and medium pressure. Manuli is focused on the first type and Trelleborg on the second type.
>
> Unifluid was already in the realm of Trelleborg and that Dynaflex was a large customer of Trelleborg. Dynaflex was not really put up for sale. It was more like there were discussions and consensus that joining Dynaflex with Trelleborg could be a good way of developing the business of Dynaflex (BM, 061120).

Unifluid was purchased based on the premise that the Dynaflex unit should be possible to acquire. The deal would not have been settled otherwise. By combining the two units TIH managed to produce the same quantity of products using only two production lines instead of the previous three. The third line that became redundant was used in a joint venture initiative and shipped to China. Apart from the production economies, technical economies could also be achieved through the combination of sales organizations, as the offerings complemented each other. Regarding banking and compensation, as Dynaflex was a small unit (with only some 20 employees), the increase in size was not substantial enough to affect these economies. From a Dynaflex perspective, the unit was leaving one large industrial group, Manuli, to join another, Trelleborg, and thus did not see any extraordinary effects in banking or compensation economies.

> No, there was not foreseen synergies in financial areas. In terms of size, Dynaflex was a very small unit. The size increase had very little impact on our business units. The reason was to be able to specialize in this particular business segment. We got access to a new product segment.(BM, 061120)

The same can be said about pecuniary economies – the change in size was not large enough to trigger pecuniary effects. Neither diversification economies were a source of synergy: TIH, Unifluid, and Dynaflex were all active in the hose market that must, by logic behind diversification economies, be considered as the very same market. However, the companies had somewhat distinct positions on that market with Dynaflex in terms of portfolio management extending the product range into areas of great potential for the future.

The fact that the purchases of Unifluid and Dynaflex to some extent were vertical M&As, where TIH acquired potential customers should enable scheduling economies. Vertical economies was reached in the sense that Dynaflex increased their use of TIH products, but scheduling economies was not neither mentioned as the driving force behind the purchase decision, nor in retrospection evaluating the synergies reached.

7.3.2 Dimension B: Organizational integration

TIH enhanced its product palette and became both internal supplier and buyer of Dynaflex' products after the purchase. By consolidating Unifluid and Dynaflex, TIH expected some technical economies in the production activity and by integrating the sales departments, invoicing would be handled centrally by TIH. Unifluid was originally a break out of people formerly employed by Dynaflex. From their perspective, the integration became a type of absorption, and a small number of employees chose not to join the combined unit. From the Dynaflex perspective, the integration more resembled a preservation.

> Overall integration has been with Unifluid and Dynaflex with the help of Trelleborg. Not between Trelleborg and Dynaflex.(BM, 061120).

> The joining was made in the way that Trelleborg bought Dynaflex in march 2004. At that point it was directly decided to consolidate the physical spaces, moving everything to Unifluid's old premises. Their premises were considered more appropriate for the business. It was also decided to make one legal entity out of Unifluid and Dynaflex. Immediately after the deal was finalized the two became 'Trelleborg Dynaflex' (BM, 061120).

Dynaflex was bought by reason of having an interesting range of products and a functional organization to manufacture these products. The overall objective was thus to enable development of the units business, for example, introducing the products to new markets where Trelleborg already had a strong foothold, as in the UK. As such, the core operations of the Dynaflex unit were left rather undisturbed and the integration could be categorized as a preservation.

> Dynaflex still has an extensive autonomy. They are still a small unit with one person responsible and reporting to our financial manager. They function as a small individual company. That was a strong desire from the Trelleborg side that they would continue to operate in this way, being quick to respond and flexible. Because, this already worked well and we had no desire to absorb them into the big unit that was located in Clermont-Ferrand (BM, 061120).

With the core operations left largely undisturbed, integration focused on integration of functional activities, for example, supervision and management. These functional activities were primarily linked through pooled relations with information flowing in one direction and only limited dependency.

7.3.3 Dimension C: Intention & Reactions

The Dynaflex acquisition was managed by TIH's sales department, and the main person in charge was the sales director. According to the interviews conducted, Dynaflex did not need this deal for financial reasons, but mainly wanted the deal out of organizational reasons. The deal was wanted by both sides, and both sides could see advantages in working together under one roof.

> Trelleborg already had contacts with Dynaflex and the deal was based on a shared view that it would benefit the business to join activities. I would categorize the deal as a collaboration, it was not an aggressive takeover or anything like that. People knew each other and saw a potential. (BM, 061120)

The takeover was perceived as positive, and there were no other plans to associate with other companies in case the deal with Trelleborg would not be successfully accomplished. In the interviews it became clear that the company was not put up for sale which further strengthens the argument that the decision evolved mutually and was wanted by both sides. The fundamentally positive approach was manifested it the adoption of the new IS:

> Employees were positive to learning the new system. That is critical, because it is the employees that use the system in the end. If they don't want to learn it does not matter what you do, it does not work. It has been a huge focus on training during the project, on to make

> the user like and use the system. This also worked very well at Dynaflex. Everybody learnt very fast. They were told that in two months you will be working with this system. […] I left the site two weeks after the go live and at that time they managed to work in the system themselves. Of course some support via mail or phone, but essentially on their own. (BM, 061120)

Trelleborg were quick to secure important key persons at Dynaflex. A few employees did not want to join Trelleborg and they left the company. After the consolidation with Unifluid some positions in the new company were double staffed which meant that some persons had to leave the company. A few people also left because they would find it hard to once again cooperate with their former colleagues.

> For them [Dynaflex employees], it kind of made sense. They already belonged to another industrial group, but were not part of their core activity. It was more logic that they would be with us than with Manuli. Therefore, the view was fundamentally positive. It made sense to everyone. But… we joined two organizations in new facilities so… sure, some people left us. At some positions there was double staffing. But it was not many that left. (BM, 061120)

> We were really quick to secure key persons at Dynaflex, some people did not want to join us and they had to leave. But basically at the time when the IS integration was finished, the working team at Dynaflex was also ready. (AG, 061213)

These persons were engaged at the management level. During and after the organizational integration there were no developments leading to conflicts inside the unit or between the unit and the Trelleborg group. There occurred a transfer of personnel from Trelleborg to the newly acquired unit in the case of the general manager/chief executive officer and also head of production which were installed by Trelleborg with internal personnel. There was nobody transferred from Dynaflex to the Trelleborg group. Employees felt part of their new company, the Trelleborg group, as they were precociously informed about the situation and its effects. They were included organizationally at an early stage in the integration and were fully granted information regarding their concerns which helped to be comfortable with the new situation.

> Directly they were given the information that even though the should be a part of the Trelleborg group, Trelleborg expected them to stay

> within their niche. Being autonomic and flexible. Not putting to much bureaucracy. (BM, 061120)

7.3.4 Dimension D: IS Ecology

The choice of what should be integrated and not was in the Dynaflex case most often decided upon by pure cost calculations as the desired integration was preservation. However, the management wanted visibility, and information level integration served as a precondition when discussing integration alternatives.

> As we bought Dynaflex we knew that we had to replace there IS. Manuli used JD Edwards. It was negotiated that Dynaflex was allowed to use the systems until September [6 months after the deal]. At the end of September Manuli would close the channel to their JD Edwards. Because of that we knew already as the deal was struck that from September 2004 Dynaflex would not have any ERP-system. (BM, 061120)

The dirrent parts of the IS Ecology were affected as foolows:

Infrastructure – Group-wide standards were, as explained earlier, rare in the Trelleborg Group. However, some did exist on the infrastructural level, and when integrated with TIH, Dynaflex automatically derived this set of standards that included security settings, email, network, and intranet solutions.

Transaction –Transaction IS was integrated enterprise-wide with the choice of extending the existing ERP system. TIH wanted one common invoicing and sales organization and made Dynaflex provide the input for such a solution by inputting production volumes and processing orders from the Movex system. However, the integration was not completely automated, as the production processes remained an isolated island.

Information – In order to develop the business of Dynaflex, the outspoken reason for the acquisition, managers wanted control over the business and full transparency activities. This was reached by introducing the supporting sales and administrative procedures of the TIH Movex system to Dynaflex.

Strategic – Neither TIH nor Dynaflex regarded IS as a strategic resource and had no strategic systems to integrate.

7.3.5 Dimension E: Integration Architecture

One week before the contract was to be signed the IT department of Trelleborg Industrial Hose was approached and told that the current owner of Dynaflex was going to continue to support and keep alive the current IS for only six months more. In March, 2004, the contract was signed and the deadline for the IT department to integrate the old system at Dynaflex into Trelleborg Industrial Hose's Movex ERP system was set to September, 2004. This was not a choice but part of the M&A deal as the unit could not continue operating the former owner's ERP system, JD. Edwards. The project team consisted of the chief executive of IS and operations, one IT manager, two junior IS managers, and occasional external IT consultants.

> We knew that we needed to do something. Then it was the question of what, there was different alternatives… should we install a system only for them, should we not install any system at all… or should we integrate them into the system that we already have… Because of the time aspect, there were not many options. We used what we had already. (BM, 061120)

As the Dynaflex unit was using the ERP system of another company there was never a choice whether to do something or not, the system had to be replaced. The new management had basically three choices, either to implement the ERP system which had been implemented nearly throughout Europe, to implement part of this ERP system, or to do nothing. The last option was excluded quite quickly as some form of IS was necessary for the new unit. After a two day visit to the site the decision was taken to keep the production related IS, since it was deemed costly to replace, was functioning well, and no synergies (except for system maintenance cost) could be gained by a switch.

> The sales department did not want to implement a too complex IS since Dynaflex at the time was a small, efficient and flexible company and if we would have implemented the full Movex package with all modules we would have destroyed this flexibility. (AG, 061213)

Project plans, milestones and time frames were made in order to manage the system integration. As the Trelleborg group already had implemented the Movex system in many other European sites, they had

experience from this work and were able to profit from this fact in the Dynaflex unit.

> We had been the same team for 3-4 years. We knew what had worked before. That was why they asked me. I had actually left France at that time, but since I was operational immediately they wanted me. The same was true for Isabelle. We could both use our previous knowledge. (BM, 061120)

The project team was confident that the given time frame for the integration was sufficient because at that time Trelleborg Industrial Hose was in a process where they had already integrated seven other national units into their Movex system which was used to manage the entire business. When integrating the other national units, the scope was around 500 persons, compared to Dynaflex which had a personnel of 20 persons. Also, the sales department did not want to implement a too complex IS since Dynaflex at the time was a small, efficient and flexible company, and if the full Movex package with all modules would have been implemented, it would have destroyed this flexibility. Another aspect was that TIH only had an interest in visibility of finished products which meant that processes like finance, sales and logistics were implemented and not the complete production module. According to the interviewees, the production module would have been the most complex one to implement in a new IS.

> We only created a new financial unit and a new company so that they would have their own databases and invoices. The management can see about everything instantly as they are in the same Movex system. (BM, 061120)

The first step in the IS integration implementation was to send two people from Trelleborg to the site in France in order to get an overview of the situation and the processes being employed in the company in particular. In this first assessment a list of processes was created which would be necessary to implement in the Movex system. This was done in just two days and after this visit to the site, management decided to implement part of the European wide system, excluding most of the production planning in order to keep the flexibility wanted for the unit. This meant that workers reported in the system what had been produced and what input material had been used to do that.

> For each process we investigated "how are they doing it today" and "how should it be made in the future". And for most processes we could decide that the latter was the standard Movex way. Later Isabelle and I went through all processes in detail investigating if it really was possible to work in that way. (BM, 061120)

In the next step two TIH employees started implementing the processes in the Movex system. One of them was a programmer and thus this person was able to handle nearly all of the programming work necessary. In some parts of the work this person had help from external ERP consultants. The other person's responsibility was to model the processes and to test them. Additionally, after the "go live," as they called it in the interview, this person also stayed on the site as support and help to the employees in the early stages of the new way of doing business. As the Movex system was already implemented in many other sites of the group, most of the processes which needed implementation already existed in the system and therefore the programmer was able to reuse them, as they only needed minor adjustments to the Dynaflex unit.

> We didn't really need to program that much. We used existing processes that we had created for the previous project. I think we only created one or two processes. For the rest we could either reuse what we had or use Movex' standard processes. We needed to investigate the databases and move the items to Movex. […] Databases is where you normally spend the most time. You have to go through which products, customers etc you want to transfer and make sure that you transfer them in the right way. (BM, 061120)

7.3.6 Dimension F: IS role

When the Trelleborg representatives were asked whether they used IS integration proactively or reactively, they would say that integration needs followed business requirements and thus was a reactive process. The IS manager at TIH described how he was notified about the forthcoming deal with Dynaflex:

> Basically the Dynaflex acquisition was managed by the sales director Patrick Pieret and one week before the contract was to be signed they came to us at the IT department and told us that the current owner of Dynaflex was going to continuing to support and keep alive the current IS for only six more months. Or actually, he came and said

> that we were thinking about buying this company and I asked 'what about the IS?' 'Good question', he responded and came back saying that they would keep it alive for six months. (AG, 061213)

In outlining the timeframe in which Dynaflex-related IS integration took place, it seems to be located within a isolated timeframe.

> We started in April and ended in… September. We worked as a small team… during may Alain and Isabelle spent time at the site I may to go through the existing processes. When I got there I June they had a good view of what existed. Isabelle and I then started go through how we could integrate them into Movex. 27 Sept was the go live. Then I stayed for two weeks- (BM, 061120)

However, when regarding TIH within a longer time frame, it becomes clear that TIH made several decisions and actions that needed to be considered as a proactive measure towards IS integration. The case story of the Kléber/CMP acquisition reports the struggle of streamlining and taking control of the information flow and consolidating the information infrastructures into manageable and controllable units. These efforts were then doubled as TIH strove to integrate Dynaflex:

- TIH had the choice of extending an existing system as the system was of "extendable nature"
- As integration work had been carried out in-house, the personnel understood the existing system and process that were available
- Reusing generic processes saved time and resources

Questioned whether the comparatively smooth integration of Dynaflex had been possible to carry through with the IS in place at the end of 1990's, IS manager Alain Guillon explained:

> No certainly not. I think it went this easy because we were in a process where we had integrated several other country business units through which we gained experience. Also our approach is not to build a new application at every country unit rather it is to expand the central Movex system and integrate other country business units in to this rather than working on local applications or systems. Back in 1998-1999 we had eleven companies and distribution centers in eleven countries and seven ERP systems to manage these different

> unit's activities. This means that there were at every business unit a local financial team, IT-department and application service provider. Now we have one invoicing company, two distribution centers, two ware houses, one financial department, one IT-department and one IS to manage and provide visibility for all these. This means that we have been able to make a lot of rationalization due to the IS integration. This also means that we have full visibility of our business units through the central Movex system. (AG, 061213)

In the acquisition of Dynaflex, TIH did not assume a proactive approach to IS integration in the meaning of McKiernan and Merali (1995), but apparently other actions were taken prior to the deal that had significant impact on the post-M&A IS integration. TIH was using a reactive approach to IS in general where IS answers to the demand of business and in the specific case of the Dynaflex purchase were not addressed until the deal was settled; thus, the deal could not be said to any degree to be driven by IS integration potential or hazards.

7.3.7 Summarizing the Dynaflex case

The Dynaflex case was characterized by the will to leave production undisturbed, but still using the sales organization and to increase transparency of Dynaflex business. It was also clear that the experiences made by TIH in the integration work following the consolidation of Trelleborg and Kléber became very useful. Existing IS had been implemented in a flexible and scalable manner which was used when integration Dynaflex. Table 7.2 summarizes the the Dynaflex case.

7.4 Case C: CRP Group

In January 2006 Trelleborg, through the Engineered Systems business area, completed the SEK 950 M purchase of CRP Group from Barclays Private Equity. CRP Group was an engineering company with annual sales of slightly more than SEK 1,000 M and 500 employees, primarily in the UK and the US. The company, which was founded as late as in 1974, had at the time of deal five UK- and US-based production units. in the UK and the US. Sales and marketing offices were located in important offshore areas.

Table 7.2 Six dimensions of IS integration in the Dynaflex case

Dimension	*Description*
Synergetic potential	
Technical economies	Marketing, production, logistics, experience
Pecuniary economies	Limited
Diversific. economies	Potential growth
Organizational Integration	
Interdependency type	Pooled
Degree of Integration	Preservation
Integrated Activity	Functional
Intentions & Reactions	
Friendliness/Hostility	Collaboration
Reaction	Low
IS Ecology	
Infrastructural	Moderate
Transactional	Low
Informational	Extensive
Strategic	Low
Integration Architecture	
Integration level	Informational
Integration structure	Enterprise-Wide
IS integration role	
Proactivity	Reactive

CRP's operations related primarily to systems for the subsea sector of the oil and gas business. The company was active in systems for seismic surveys, drilling operations and subsea production, with solutions for deepwater flow assurance and buoyancy systems, as well as many specialized engineered polymer-based solutions. As a result of the acquisition, oil and gas related operations within Trelleborg were expected to increase with 7-8 percent of total group sales.

7.4.1 Dimension A: Synergetic potential

The purchase was said to make the Trelleborg Group a market leader on a global market (with some kinds of market definitions), but it did not lead to such a position that it would have significant impact on monopoly or monopsy economies. Rather, the deal was justified with the already profitable business of the acquired company as well as potential savings in marketing, sales and product development. The target company also represented diversification economies. It was said to have its business in a potentially growing market. Further, scrutinizing the business of the CRP Group, there was an apparent overlap with the business within Trelleborg. However, whereas Trelleborg had a strong presence in northern Europe, the CRP Group had similar business, but mainly in UK and US. CRP's production

facilities were located in Skelmersdale (also head office) and Barrow-in-Furness, in the UK, as well as in Randolph and Canton, Massachusetts, and Houston, Texas, in the US. The M&A could thus be seen as a market extension with similar products but at different markets. The complementarity opened up for potential economies of scale in, for example, production, scheduling and logistics, but it was not the outspoken ambition to seek synergies within this area.

> The CRP acquisition was a step into an attractive segment. We already had some business within this segment, but with CRP we at least tripled our precense in that segment. (LEO, 040408)

A late update in the CRP case is that Trelleborg is now seeking to further leverage synergies in the overlapping business. The business of CRP group was mainly in the offshore industry. Within Trelleborg, the already existent offshore business was mainly located to Trelleborg Viking, a Norweigian-based part of the Trelleborg group. Trelleborg Viking was established in 1896, and serves customers mainly in northern Europe from their location in Nedre Eiker, about 60 km west of Oslo. During 2007 an integration project started with the ambition to integrate Trelleborg Viking's offshore-business into the newly created unit Trelleborg CRP. At the time of the writing this project has just commenced.

7.4.2 Dimension B: Organizational integration

The CRP group was left rather undisturbed after the purchase. The group was annexed under the Trelleborg umbrella as a new business unit, called Trelleborg CRP. Trelleborg had no ambition to leverage synergies related to production, scheduling, or logistics. Therefore the unit could be kept separate. However, it was not a pure holding approach that was taking place. The ambition was to integrate sales, marketing, and product development. Trelleborg also wanted the new division to culturally become a part of the group.

> It is of course hard to put the finger on exactly what that would be, but we want of course CRP to take part of some Trelleborg spirit, whatever that might be. (JTP, 060411)

From a Trelleborg Group perspective, the management also wanted some control over what was going on in the business unit, although management of the unit would be highly decentralized. Trelleborg representatives expressed that the former CRP employees were surprised by the passive approach taken by Trelleborg after the deal was settled. They expected more dramatic changes, drawing towards the absorption-alternative, than took place in reality. This was a manifestation of different corporate cultures, but as no extensive integration was expected, the cultures could be described as different, but not clashing. The norms and values never had to be confronted.

When it came to the integrated activities and their dependencies, the sales, marketing, and product development were considered to be functional activities with pooled dependencies.

The purchase of CRP Group was in judicial terms an acquisition and with the definition of acquisition applied in this text it also seemed like a typical acquisition – a takeover of a less powerful organization by a more powerful one. However, as in the Kléber case, development took a slightly different path with Trelleborg management, in many ways regarding CRP as an equal part and choosing "preservation" as the integration strategy. To further complicate the distinction between acquisition and merger in this case, with the integration of Trelleborg, Viking integration was turning out to be some kind of reversed absorption. The "acquired" unit was now absorbing operations of the "acquiring" company.

> Now that CRP and Viking are joined organizationally, it is natural that the initiative stayed with the former CRP management, simply due to its size. That part was some three to four times larger. (LEO, 040408)

This clearly highlights why it might be hard to distinguish between mergers and acquisition, and why theoretical developments foremost have been on the combined phenomena and avoiding the discussion of where to draw the line.

7.4.3 Dimension C: Intention & reactions

Peter Nilsson, Trelleborg's CEO made a clear statement already in the press release following the closure of the deal:

> We have been following CRP for some time and are delighted to now reach an agreement regarding the acquisition of this global leader and its extensive technological and market expertise.

The use of the word "expertise" represented a shared understanding within the Trelleborg Group. The CRP was regarded with respect. It was profitable and present on a market which Trelleborg had been striving to enter for some time. This was the initial condition of the M&A, and thus the natural extension to a collaborative integration process.

As the annexation, only to a limited extent, led to organizational, structural and cultural transformation the reactions were limited. Interviews did not reveal any particular level of distrust, except from some questions whether Trelleborg actually meant not to undertake any far reaching changes after the purchase. Turnover rates directly related to the owner shift were low.

7.4.4 Dimension D: IS Ecology

The IS integration work was clearly centered around one type of IS: Infrastructural IS. Minutes from the first meetings between IS managers from TES and former CRP Group revealed that the first questions at the table concerned how to make the existing infrastructures communicate with each other. The topics of discussion included very technical concerns like standardization of network servers, user directories, and use of IP-numbers. Trelleborg wanted to expand their e-mail structure and intranet to the acquired unit in order to spread the feelin of working under the Trelleborg umbrella.

Infrastructure – Infrastructural IS was the main target for integration. Although simple to its outset, it took about 8 months until everything was up and running. This was despite that the two units had a very similar infrastructure already before the M&A. For example did both units use Lotus Note and Novel technology.

Transaction – Already from the start it was known that CRP had to replace their ERP system. As Trelleborg explained: "They used ERP matching a small company, not matching their size. They had completely outgrown the system and the private equity that was the current owner had not interest in making investments to replace it". However, the new system was not integrated with the rest of TES but was a separate installation.

Informational – Information oriented IS was not a primary target for the integration activities, but the financial system was replaced only weeks after the deal was closed in order to enable accounting to the standards of Trelleborg.

Strategic – Neither TES nor CRP did possess strategic IS.

7.4.5 Dimension E: Integration Architecture

As argued in the theoretical review in chapter 2, the concept of Enterprise-wide systems could be useful in order to describe the approach of integration architecture. Here it was, although the IS was not enterprise-wide if regarding it from some perspectives. However, from the viewpoint of infrastructural IS the approach was enterprise wide. With respect to the IS integration that Trelleborg intended to carry through, the Group employed enterprise-wide standards. Standards with exceptions, of course. Yet the approach could be summarized as conceptually enterprise-wide.

7.4.6 Dimension F: IS integration role

There is no doubt that IS integration in the CRP case was reactively employed. IS or IT personnel were not involved in planning or due diligence. In the sense that IT personnel were informed about the plans, it was only to prepare for the integration work required. The IS integration work was planned on the basis that CRP should maintain a large extent of independence.

> I learnt about the deal only weeks before it took place. This is how things go normally. You cannot prepare for everything, you discuss and plan for numerous deals simultaneously. Most of them will never take place in reality. Then one deal suddenly becomes reality and you have to deal with that one. I don't think anyone can foresee wich deals that will become in the end. (JTP, 061107)

> Did we think about IS and IT before the deal? Yes. At least I did. We discussed the ERP a little bit and knew what they had, and that we had to replace it. In that way it was simple, we knew that we had to replace most of things and that was in the plan. Some parts of the plan were more urgent than others. (LEO, 040408)

It is clear that on the basis that only limited technological synergies were sought, reactive IS integration planning included a limited risk. The integration work required was not of the kind that risked the leverage of synergetic potential and did not differ much from other integration work in the company.

7.4.7 Summarizing the CRP case

The CRP case seemed at a first glance to present an M&A in which few synergies were sought and only infrastructural IS integration had to be integrated in order to leverage the modest synergistic effects. Preservation of CRP as an individual unit seemed as the only natural choice based on the synergies strived for. But then, attributed to the shift in CEO and a more intense focus of synergistic leverage throughout the organization, it was decided by TES to use reversed absorption, integrating previous Trelleborg operations into the operations of former CRP Group, now Trelleborg CRP. At the time of writing, these changes had just commenced and effects could not yet be seen, but discussions concerning which additional IS had to be integrated and how this could be done were taking place. Table 7.3 summarizes the CRP case.

Table 7.3 Six dimensions of IS integration in the CRP case

Dimension	*Description*
Synergetic potential	
Technical economies	Marketing, sales, RnD
Pecuniary economies	Limited
Diversific. economies	Potential growth
Organizational Integration	
Interdependency type	Pooled
Degree of Integration	Preservation
Integrated Activity	Functional
Intentions & Reactions	
Friendliness/Hostility	Collaboration
Reaction	Low
IS Ecology	
Infrastructural	Moderate
Transactional	Low
Informational	Low
Strategic	Low
Integration Architecture	
Integration level	Infrastructural
Integration structure	Enterprise-Wide
IS integration role	
Proactivity	Reactive

7.5 Case D: Chase-Walton

This fourth case tells the story of how Chase-Walton became a part of the TSS area in 2005. In this section, once again, a fundamentally different integration-story is presented, where the difference in business model between TES and TSS is illuminated. As described earlier, the three previous cases that were presented ended up as business units within the TES-division. The cases showed that the organizational context of the highly decentralized division decidedly affected the way integration work was carried out and which decisions were taken. This fourth case is different in that the integration process organizationally was located in the TSS-division. TSS has a fundamentally different approach to business structuring, which, as will be described, have far reaching consequences for the related IS integration in an M&A.

The business model of TSS was described earlier in this chapter. This section focuses on how well Chase-Walton would fit into that business model and which measures needed to be taken in order to integrate the company.

7.5.1 Dimension A: Synergetic Potential

Chase-Walton Elastomers Inc. was until 2005 an American based, production-oriented actor in the sealing and damping business with production facilities located in Hudson, Massachusetts. It was privately owned since founded in 1955. There were two primary reasons why Chase-Walton caught the eyes of TSS. First, in relation to global size TSS considered themselves underrepresented on the American market in which they saw a substantial growth potential for their products:

> Relatively we're not very strong in the Americas (22%). The Americas market must be as big as Europe, but we're close to being the leader in Europe, but we're just another player in the US. So we want more rapid expansion in the Americas. (DB, 061206)

The purchase of Chase-Walton would help TSS to get local physical presence on the US market as the takeover would give access to Chase-Walton's existing stock of customers. As such, Chase-Walton was a geographical market extension.

> We can sell our seals to any industry; the question is where should we sell our seals – where can we have the highest sustainable profitable growth? Which segment should we work on? […] Obviously when you try to accelerate growth you should try to go at areas where you think that the seal you will sell can serve these critical functions. So when we look at segments we look at the competition, the need, the growth of the industry but also the potential to do that – to have sustainable margins. (MD, 061207)

The second major reason why Chase-Walton attracted TSS was because of their customers in the Aerospace industry. To become a supplier in this industry can be a fairly lengthy and resource demanding process and the deal with Chase-Walton was a fast lane into this market:

> We identified some years ago that Aerospace was an area where we were not as strong as we ought to be. It fitted where we and our customers see ourselves that we're providing high quality and high tech solutions. So we set out that an ideal acquisition in that area would be a company manufacturing and delivering Aerospace products in the US. And Chase Walton fitted that. (DB, 061206)

> They had some very exciting products that we liked – airframe products. These we produced in our facilities in Europe as well. In a lot of cases, surprisingly enough, even though we serve the same kind of customers the products are very different. That was one thing that we found out, that was interesting. Of course there are a lot approvals, it is a very regulated environment, so once you get an approval it is a very nice business to have of course. So if you get a design that is approved for these kinds of aircraft, I wouldn't say it is captive business but it is a good business to have. (MD, 061207)

As an interesting perk, Chase-Walton also had customers within the Medical industry, an area which TSS was new to. In this sense, the market extension was a way of entering a new type of industries.

In addition to the market extensions that would enable synergetic benefits in terms of increased sales for both companies, cost savings were also expected due to the increase in size. Better terms with suppliers were expected and also savings in overhead expenses due to consolidation of administration and supporting functions.

No synergies could be expected in monopoly and only marginal monopsy economies could be expected. However, Trelleborg already had collaboration with other industrial corporations on the factor

market that enabled a stronger position in relation to its suppliers; seen in the light of that collaboration, Chase-Walton represented only marginal growth. Trelleborg feared that some kind of inverted-monopsy synergy could unfold after the deal with Chase-Walton since the conditions for the deal negotiated a special clause. Trelleborg was already an important supplier to American aviation-manufacturer Boing, one of Chase-Walton's most important customers. Trelleborg feared that Boing would be hesitant to be dependent on a foreign supplier:

> We made it conditional that after we signed the contract that we wanted to talk to the purchasing people in the three main Boeing plants. Now, we found from all of them that they liked Chase-Walton, they liked the product, they liked the service. They got what they wanted, they got it quickly and with high quality, but they had reached the limit of the business they were prepared to do with Chase-Walton because it was a small 100 man company. When Trelleborg acquired Chase-Walton they knew that they could expand significantly, once it had the backing of a big supporting parent. So far from the position that we feared that the orders might dry up, the orders have come flooding in. In all regards it's been a very successful acquisition. (DB, 061206)

Finally, regarding diversification economies, these were marginal, at least they were not synergies sought for nor related to any of the integration activities following the M&A.

7.5.2 Dimension B: Organizational Integration

The outspoken ambition at the day of closing the deal was to make Chase-Walton "fully integrated" (Trelleborg press release, 2005). In the process of folding a new unit into the business model of TSS, the former stand-alone company was partitioned and the business activities were assimilated within TSS. The production part became a group supplier, the sales staff were integrated in the marketing unit, and the logistics became a part of the SCM. This was deemed necessary to reach synergies related to economies of scale and scope, and the possibility of introducing new products to existing customers. This meant that the future group supplier, Chase-Walton, would have one single customer alone: the TSS marketing units. TSS had an clear strategy to divide the

new unit into parts that matched the existing model and to integrate the activities separately:

> When we acquire it [a future acquisition], all the selling and marketing activities will be taken off it, and they'll be bolted into the business model that we have in the US. All the manufacturing operations will then join this BU and then become part of it. And we've already thought that there is another product line in other locations that complements this product line, so we'll be moving it in there. So within 6 months they'll be cut in half and completely following our business model. (DB, 061207)

With respect to the assimilation of Chase-Walton into the business model of TSS, it was fruitful to have the TSS business models with its distinction in marketing, logistics and production activities as starting point. Regarding the marketing activity, the objective was to share the geographical as well as industrial presence, coordinating sales and customer basis. Thus, the only possible level of integration was full integration, and considering the TSS idea of one global business model absorption was the natural choice. TSS, being a marketing-driven company, what they delivered was dependent on the marketing, rather than the production. The need for organizational autonomy was low as customers expected only one marketing function. Because the need for strategic interdependence was high, they did not carry any of own goods, but rather acted as distributors of the production facilities.

Chase-Walton followed the outspoken strategy of dividing the target into activities that could be separately integrated into TSS' business model:

> When we acquire a company it is usually run in the usual way that it produces parts and sell parts to the end customer. I don't think, as long as I have been with the company anyway, that we have only looked into manufacturing sites. With the integration of such an independent site it will become a manufacturing site over time and we will take away all the customer relationship activities and integrate that into the respective marketing organization. And the logistics will eventually go the SCM organization so it will become a group supplier eventually and the customer relations will be simulated by the appropriate organization. (AJ, 061206)

The Logistics activity's only source of synergy in this case was to actually relocate the physical locations of stock and people, which would have resulted in more resource-efficient operations where all shipments and storage was dealt with centrally. Analogous to the marketing, while there was no need for autonomy, there was a huge need for interdependency as stocks were moved – hence: *absorption* was the appropriate business integration level, as the target activity was completely absorbed into the acquirers processes. Once again, there was a situation of shared or rather redesign of processes.

The only main business activity that did not require absorption was the manufacturing activity. TSS stated that it was not really that important from whom they bought their products. While manufacturing was not a major target of the acquisition, the only realizable benefits were cost synergies as they were able to get better terms with suppliers and such. Synergies of this kind, known as combination benefits, did not require strategic interdependence, that is, the target might be left independent to a large extent. The only collaboration required was on a basic transaction level where orders needed to be sent back and forth. The conceptual level of integration required was on a more basic object level. Thus, as the re-engineering of business processes was not required, the *preservation* level of integration was most suitable. TSS stressed that they had bught Chase-Walton because it was a well functioning company which they had no intention to destroy:

> We are buying a company because we think it is growing well and it is performing and we can bring it to its next stage. The actual most important thing is not to break it when you buy it, and that can happen easily. (MD, 061207)

7.5.3 Dimension C: Intention & Reactions

The takeover of TSS did logically come with changes for the former Chase-Walton's, and now TSS Hudson's, employees. Chase-Walton's most prominent business of manufacturing did assume a more low-key role in the marketing driven business model TSS. The marketing activity of TSS could decide to purchase what was needed to answer to the demand of their customers from other sources. Neither the most prominent reasons for the purchase, nor the access to the Chase-Walton base of customers in the aerospace industry, nor the foothold on the US

market would at a first glance secure the production. However, the products and sales structure of Chase-Walton was what created the foothold and relationships into the aerospace industry. Likewise, the integration into the business model of TSS also opened up new markets for TSS Hudson, for example, in Europe and Asia.

The situation of Chase-Walton before the M&A also had to be regarded. Chase-Walton was owned privately since its creation in the mid 1950's. It was founded by two men, Chase and Walton. Later Walton bought out the shares of Chase. Trelleborg bought the company from the son of Walton, as the son approached his retirement. Trelleborg had to present a plan of what to do with the company and how to deal with the employees:

> After the management presentations and the initial bids, it became clear that he [Walton, author's remark] preferred Trelleborg. He felt that he had a good understanding of Trelleborg and he liked the way that Trelleborg would treat the company and the people after the acquisition. What he really didn't like was the hard negotiation. He particularly didn't like me. It made for some interesting face to face conversations… My role and why I was difficult, and of course I always would be difficult in these situations is to protect ourselves against anything that we might find in the balance sheet after acquisition. And this was offending him, that I would challenge and question… But at the end of the day, he was right. I have not found anything wrong in the balance sheet. But of course I'd always go through the same process. (DB, 061207)

The owner family did not have the same resources as a global actor to develop the business and, for example, production facilities were severely lacking maintenance:

> The premises they were operating from were…dreadful. They were literally a hundred years old. In the US that's pre-historic! Some of the plant, I was shocked when I saw for the first time the processes that they were using to make sealants that our lives depend on everyday. […] So we rapidly needed to get them into some modern premises, with modern equipment. (DB, 061207)

Some employee turnover did take place, most of it purposely initiated by TSS, for example, a new plant manager was installed at TSS Hudson. Trellleborg considered that they were relatively positively met

by the personnel since for a long time they had known that Chase-Walton was up for sale:

> So how did they react to us? Firstly, they were very welcoming, the owner and the management team. […] But things deteriorated, particularly towards me through the process and I think that things were quite bitter at the end.
>
> We had decided as we went through the process… that of course the owner would step out, he had no desire to stay on. The guy who effectively ran the company for the owner would not have fitted into our structure, so it was decided early on that he would be leaving as well. But below that, the next tier below that, we worked hard to bring them on board, post-acquisition. And they have all settled down and stayed. Then the people actually doing the work in the company, we worked hard to show them that we would be a good employer. And that has been very successful, we've had very low turnover. It's a good stable workforce. The other side of things…the workforce is stable, they're performing well. They're out there winning orders for us, at a much faster rate than we had hoped for, there delivering to the same standards. It's been very successful. (DB, 061207)

TSS also seemed to have followed just the recommended approach of making organizational and structural changes directly after the deal was closed when employees expected changes to take place. Marketing and logistics were immediately transferred to TSS, and the infrastructural integration work was finished in two weeks.

7.5.4 Dimension D: IS Ecology

As the previously described cases, the purchase and integration of Chase-Walton included numerous approaches to IS integration that differently addressed the various parts of the existing IS within the two involved companies. The major condition for driving the integration choices was the global business model and what in this case was considered core business activities.

> When we would get involved is initially taking care of the IT infrastructure, bringing them onto the network, making sure that their email system is compatible with our. That is kind of the initial work. And then we review the necessity to provide them with ERP

> type functionality, once again depending upon the size of the company, how this process of splitting up different responsibilities into our organization is progressing. That is the way we go forward.
>
> In the case of TSS Hudson it was obviously that when we acquired them we went in there and replaced their infrastructure and gave them our email system. We obviously reviewed their need for ERP type system support but there were other factors as we had to move the site to a different location, there was some management change going on at the time and the decision at that time was to not put another burden on the site by replacing their ERP system initially. That is in the plan for the future to rollout JDE and integrate them into our ERP systems landscape. (AJ, 061206)

In summary, integration of the four different types of IS was made as follows:

Infrastructural IS – Creation of additional technology for automated integration of IS was mostly concerned with linking the infrastructural IS of the two companies. As mentioned earlier, the Trelleborg group employed group-wide standards for such things as email, network connections and intranet. New linkage had to be set up to include the new facility in Hudson. This linkage was made in two weeks after the acquisition, a timeframe described as normal by TSS.

Informational IS – Unlike, for example in the Dynaflex case, there was no actual need of having informational integration since TSS had no outspoken strategy of taking managerial control and developing the business of Chase-Walton in terms of reconsidered strategy. However, informational integration was achieved by lifting marketing and logistic activities into the enterprise wide system.

Transaction IS – For logistic and marketing the Transaction IS integration was solved by the complete absorption of the activities. For production integration is currently solved by ”Excel – the worlds biggest ERP!” (AJ, 061206). Exactly how the final integration of Transaction should be made was yet to decided at the time of interviews.

Strategic IS – Neither TSS nor Chase-Walton had IS that was considered to be of strategic importance.

7.5.5 Dimension E: Integration Architecture

The IS strategy of TSS differed slightly between that of the Americas and Europe/Asia. The discrepancy was mostly a direct consequence of previously different business models and from that time stemming legacy systems. As the case at hand was situated in the US this was the primary concern for this account, but in order to understand how the IS integration fit into the complete infrastructure of TSS, the situation in Europe and Asia will also be dealt with as a point of reference.

TSS had a distinct enterprise architecture approach that was based on their business model and their ERP system. The focus was the marketing and logistics activities – JD Edwards World in Europe and JD Edwards One World in the Americas. The integration strategy that was employed to integrate Chase-Walton was simply to add this unit to the existing instance of JDE One World:

> Because, no matter what they used, we'd be replacing their systems with our systems, our own ERP. (DB, 061206)

This was more so the case for the marketing and logistics activities, the value chain model was in fact developed around the ERP. For the manufacturing, where the integration need was not considered critical, the integration was carried out via middleware interfaces exchanging data in EDI format. Other IS that could have been used were not integrated at all, except on an occasional basis. Figure 7.5 depicts how the different activities of Chase-Walton were integrated into the TSS business model, contrasted with what would had been the case for a European or Asian acquisition.

Chase-Walton's most visible activity, the production, was to be integrated into JDE OneWorld. This was the model of the Americas, where the rest of the world ran a separate system (ForthShift) that was interfaced into JDE. Whatever the system employed in production, it was only deemed utilitarian, as there was no real rush to replace legacy systems or even interfacing them into TSS's ERP-landscape. The transactions that the production apparatus dealt with were, accordingly to TSS, very basic and could be handled by fax if necessary. This activity required very little coordination across organizational boundaries and was therefore only viewed as utility.

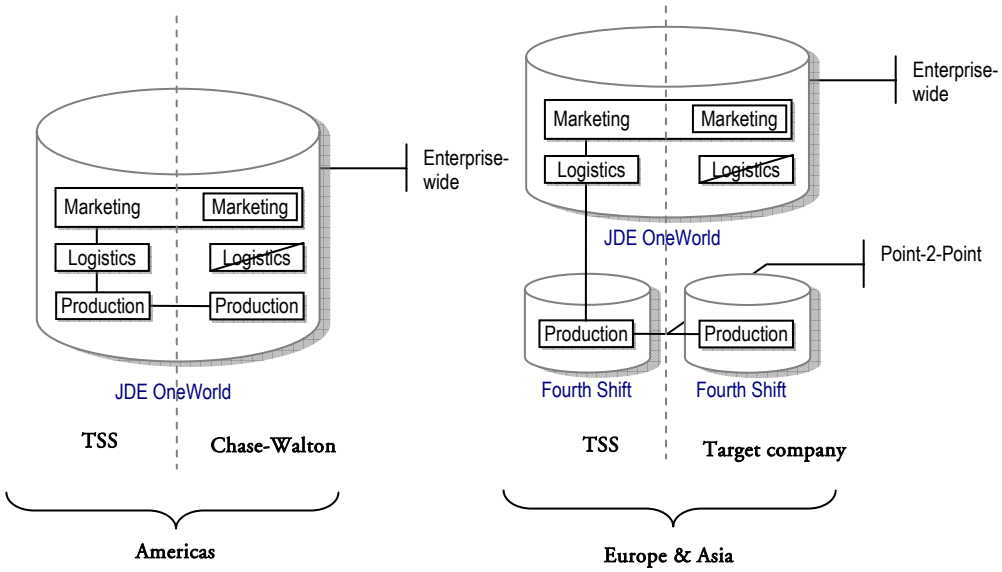


Figure 7.5. Conceptual illustration of IS integration at TSS

> We might set up EDI for the time being or … usually there is no need. They are rather simple transactions, we can eventually treat them like an external supplier but they are part of our intern group. So it's based on paperwork, we send them an order and we receive the goods with a delivery note and an invoice. It is just a normal trading relationship whether they are internal or external, that is always an option even if it is not no 1. (AJ, 061206)

Since Chase-Walton sat in the business area of the Americas, their manufacturing activities would be integrated *enterprise-wide*, as they were brought into the ERP-system. In Europe and in Asia Pacific *ForthShift*, a common manufacturing system, was being rolled out on the manufacturing unit one by one. In the meantime, however, while waiting for this rollout, old legacy systems were interfaced via EDI. As EDI was a standard for the transfer of data this was considered a *middleware* integration since there would only be one interface on the acquiring part of the integration, no matter how many targets that are acquired.

7.5.6 Dimension F: IS integration role

What McKiernan and Merali (1995) described as proactive use of IS integration targeted the match of the IS systems and the possibility to integrate these systems. On that issue TSS said that the question they

addressed before the purchase was whether the new unit could maintain their ERP for a limited time or if it had to be exchanged immediately:

> We were not acquiring the company because of their IT but because of their business. For sure, and also it depends on the size of the company – you know if it is just a small privately owned with a few hundred people they surely have a kind of system even if it is the most popular ERP system in the world – Excel – then they have something they runt their business on today and we certainly take a look at that and look at the infrastructure and we place a few questions in the whole due diligence process. But that is really how far it goes. It is really just a few generic questions in terms of if the current system is outsourced, insourced, what platform etc. (AJ, 061206)

> Coming back to the IT aspect, not once did we consider how the systems worked, how the would interface with ours. Because no matter what they used, we'd be replacing whatever they got with our systems, our own ERP. If a company had systems that couldn't give us what we needed, we'd replace it in within the first week. It's not a feature of the process and it doesn't affect the decision. We'll see what we've got just prior the acquisition and it won't affect the decision.

> We're getting close to the conclusion of an acquisition of a distribution company and again I haven't even looked at what systems they're running. Of course we've done the due diligence so we know what they are, but within a month of acquisition they'll be moving on to our business model. So again it's largely irrelevant what they're running and it neither influences one way or the other whether they've got adequate systems or not. (DB, 061206)

This was truly a straightforward way to deal with potential uncertainties of IS integration. Including the new operations into the existing IS of TSS was seen as a mean to put the unit into the business model of TSS. The role of the IS were supporting the business model, but not developed particularly to enable the business model:

> I'd say that it's supportive. If we could go back, and we'd have a clean sheet of paper, we wouldn't have gone with JDE. The reason that we went with JDE and possibly part of the reason that we were given the funding was that we were on JDE before in the marketing organization in Europe, and it wasn't 2000 compliant. So something had to be done. At the time also, funding was made available within

> TI [the industrial group to which TSS belonged at that time, author's remark] for those areas of business that could benefit from enhancing their business model through IT, so we really took advantage of that. […]. But as I said, we should have sat down and looked at the market and what we wanted from the system. […] And we did make compromises with our business model in order to fit into JDE. So its not perfect, its supportive. I mean it works well, it's better than what we had in the 90's, but it's not perfect. (DB, 061206)

7.5.7 Summarizing the Chase-Walton case

The Chase-Walton case was characterized by TSS's clear business model and purposeful integration of Chase-Walton into its specific activities. The main activities were, in turn, characterized by a "replace it all"-strategy as the processes were highly intertwined with the IS in place. On the other hand, for the production activity, no specific integration was sought. Table 7.4 summarizes the Chase-Walton case.

Table 7.4 Six dimensions of IS integration in the Chase-Walton case

Dimension	*Description*
Synergetic potential	
Technical economies	Marketing, sales, logistics
Pecuniary economies	Limited
Diversific. economies	Limited
Organizational Integration	
Interdependency type	Pooled, Sequential
Degree of Integration	Absorption, Preservation
Integrated Activity	Functional, Operational
Intentions & Reactions	
Friendliness/Hostility	Take-over
Reaction	Low
IS Ecology	
Infrastructural	Extensive
Transactional	Extensive
Informational	Moderate
Strategic	Low
Integration Architecture	
Integration level	Organizational (and IT)
Integration structure	Enterprise-Wide
IS integration role	
Proactivity	Reactive

7.6 Contribution of Chapter 7

Chapter 7 has presented the empirical data from four cases of IS integration management in M&As at Trelleborg AB. The cases present clearly distinctive stories, spanning from very little IS integration required with several IS left without being integrated, to requirement of complete integration of all existing IS. The cases present a number of ways in which attributes of IS integration relate to the M&A context. In the next chapter a systematic presentation of these relations will be made.

8. The relationship between IS integration and M&A

Chapter 7 presented four case studies, based on M&A made by Trelleborg AB. The cases were presented using the theoretically grounded framework for IS integration in M&A (introduced in Chapter 6). This chapter is directed toward the relations between the dimensions, based on a combination of the findings in individual dimensions and their implications on other dimensions.

8.1 Case coverage

The four cases naturally touch upon all six dimensions in the framework, although it becomes immediately clear when approaching the cases that the attributes play different important roles in the four M&As. In total, the framework contains 17 classification concepts that have been used to describe the M&A and related integration. These 17 concepts present a set of 39 attributes. The four case stories in sections 5.4 – 5.7 covered 28 of them (see Table 8.1).

Table 8.1 Case Coverage

Dimension	*Kléber*	*Dynaflex*	*CRP*	*Chase-Walton*
Synergetic potential				
Technical economies	Marketing, production, logistics, experience, scheduling	Marketing, production, logistics, experience	Marketing, sales, RnD	Marketing, sales, logistics
Pecuniary economies	Limited	Limited	Limited	Limited
Diversification economies	Limited	Potential growth	Potential growth	Limited
Organizational Integration				
Interdependency type	Pooled and sequential	Pooled	Pooled	Pooled, Sequential
Degree of Integration	Symbiosis	Preservation	Preservation	Absorption, Preservation
Integrated Activity	Functional and operational	Functional	Functional	Functional, Operational

Dimension	*Kléber*	*Dynaflex*	*CRP*	*Chase-Walton*
Intentions & Reactions				
Friendliness/Hostility	Collaboration, Contested Combination	Collaboration	Collaboration	Take-over
Reaction	Low	Low	Low	Low
IS Ecology				
Infrastructural	Extensive	Moderate	Moderate	Extensive
Transaction	Extensive	Low	Low	Extensive
Informational	Moderate	Extensive	Low	Moderate
Strategic	Low	Low	Low	Low
Integration Architecture				
Integration level	Organizational	Informational	IT	Organizational (and IT)
Integration structure	Enterprise-Wide	Enterprise-Wide	Enterprise-Wide	Enterprise-Wide
IS integration role				
Proactivity	Reactive	Reactive	Reactive	Reactive

In case selection, priority was given to IS attributes since the M&A phenomenon as such is well documented in prior research, but what is lacking is the connection to IS integration. Diversity was searched within the IS integration dimensions D-F. With the result in hand, this is the outcome:

- D. IS Ecology: Integration of Infrastructural, Transactional, and Informational IS were well covered. Case CRP had focus on Infrastructural IS. Case Kléber on Transactional IS, and Case Dynaflex had focal point on Informational IS. Trelleborg does not have any outspoken strategic IS. What comes closest to being strategic is the IS that supports the primary activities of TSS.
- E. Integration Architecture: If starting with the three potential integration levels, the cases address all of them. Case CRP mainly concerns integration on IT system level, Case Dynaflex is typically infologically oriented, whereas Case Kléber and Case Chase-Walton are examples of integration on a business level.
- F: IS integration Role: The existing literature on IS integration role largely argues in favor of a proactive use of IS integration, based on empirical material from IS integration made reactively. Proactive use, at least in the sense meant in the literature, seems to be extremely rare in reality. Case Kléber and Case CRP were purely reactive, but Case Dynaflex and Case Chase-Walton did

include some degree of proactive thinking in terms of IS, but not in the sense of the proactiveness-concept.

M&A attributes had, as stated earlier, a lower degree of priority, although to an extent, the possible cases were searched to represent a multitude of different attributes. The whole research builds on the postulate that there exists some kind of relationship between IS integration attributes and M&A attributes. Therefore, since almost all variations in IS integration were covered, this should imply some degree of diversity also among M&A attributes. Thus, the situation is:

- A. Synergetic Potential: All cases describe cases that were primarily driven by technical synergies. However, diversification synergies were present in Case Dynaflex and Case CRP since the acquisitions were driven by the will to extend business into areas with high growth potential where current operations were weak.
- B. Organizational Integration: On the organizational integration, it can be said that the Holding alternative is completely omitted. This is logical, as holding naturally imposes no integration needs and thus is less relevant for studying IS integration in M&A. The preservation-category reflects well Case CRP, absorption to parts of Dynaflex and Chase-Walton cases, and Kléber is a symbiosis. Integrated activities were both functional and operational. Dependencies between integrated units were pooled and sequential, not reciprocal.
- C. Intentions & Reactions: Regarding the integration approach, the hostile takeover is not covered at all. No such cases were to be found in the flora of Trelleborg acquisitions as it is said to be too risky. This relates to the fact that all reactions could be classified as low or moderate with limited turnover rates.

8.2 Theoretically identified relations

As a starting point, to make the presentation of relations between IS integration and M&A complete, the presentation starts with recapturing the five theoretically defined relations and see how they conform to the empirical data from the four case studies.

AB1: A. Synergetic potential – B. Organizational integration

Proposal: The degree and mode of integration should be dependent on synergies expected, as higher levels of integration are resource demanding (Haspeslagh & Jemison, 1991). In chapter 3 it was explained how different kinds of synergies were leveraged by different levels of integration. Leveraging monopoly synergies do not demand integration to the same extent as do production or scheduling synergies.
Findings: All cases confirm this proposal. In general, Trelleborg has understood that integration requires extensive resources and is not strived for per se. Rather, as in the CRP case, some integration is considered too resource demanding, although potential synergies do exist, to carry through.

AF1: A. Synergetic potential – F. IS integration role

Proposal: A proactive use of IS integration enables more accurate synergy estimation and possibly identification of supplementary synergies (McKiernan & Merali, 1995). As IS integration is a risky and cumbersome process, it is an issue that has to be considered early in the process. If not, costs related to IS integration can rapidly overshadow the benefits of the integration. McKiernan and Merali even argue that sometimes relative ease in IS integration could even be a reason to make an M&A.
Findings: Only one case touches upon this issue, the Kléber-case. This case confirms that the relation exists. However, what is found in the CRP-case is that Infrastructural IS integration was less affected by the M&A context. As will be described later, there exists a relation between synergetic potential and IS type; therefore, there is an indirect relation between synergetic potential and IS integration role showing that a proactive use of IS integration only is important when it comes to IS integration which is more heavily affected by the M&A context, i.e., Transactional IS.

BD1: B. Organizational Integration – D. IS ecology

Proposal: Operational integration requires integration of the internal value chain, which requires heavy integration of Transactional IS. Functional integration, in turn, is related to integration of Information IS. The more complex dependency of operational units should make integration in Transaction IS more demanding in terms of resources

and time, compared to Informational IS (Barki & Pinsonneault, 2005; Weill & Broadbent, 1998).
Findings: Case Kléber and Case Chase-Walton represent operational integration that led to integration of Transactional IS. Additionally, the functional integration in the Dynaflex case was manifested in a need for integration in Informational IS. This indicates that the suggested relation is true.

BD2: B. Organizational Integration – D. IS ecology

Proposal: Stylianou et al. (1996) suggested that the IS fit, as part of the organizational fit, had significant impact on the resources needed for IS integration. Not only did they find that differences in the two companies' IS, for example programming language if internally developed, had a negative impact on resources needed, but they also found that determining these differences and taking action upon the information prior to the M&A did have a positive impact. This further strengthens the evidence that IS fit is significant in M&A.
Findings: Only a limited relation between IS fit and resource use could be found. In the CRP-case, it was noticed that the switch to a new platform for email and internal communication was facilitated by the fact that CRP already used Lotus Notes. However, in the context this was a marginal saving. In the other cases no such savings could be found. Even in the case of the two units running the same ERP (Kléber, Movex), the two systems had different instantiations based on different infological models, and in the end it was most efficient to suppress one of them. The findings do not suggest that if there were to be an exact match in the IS fit, it would not have an impact, but they strongly throw into question whether this fit does exist. If two ERPs by the very same vendor are not a fit, what then is?

BE1: B. Organizational integration – E. Intention and reactions

Proposal: Resistance among employees may cause integration problems. If one strives for higher degrees of integration, it is not a good idea to have the workforce opposing you. What Buono and Bowditch contributed was the insight that helps understand when and why people are opposing the integration in order to avoid such situations (Buono & Bowditch, 1989).
Findings: None of the cases depicts a hostile takeover process and cannot claim to confirm or refute the relation. To say that collaborative

processes do not lead to employee resistance is not the same as saying that non-collaborative do.

DE1: D. IS ecology – E. Integration Architecture

Proposal: If integration of Transaction IS, as suggested, is more demanding and requires deeper coupling than Informational IS, then it has consequences for selection of integration architecture. Integrating a whole operational chain with point-to-point architecture should logically be too complex. In this case, a single system, not perhaps a complete Enterprise-wide, but at least some sort of "process wide" architecture can be claimed to be more suitable (Markus, 2000).
Findings: Case Kléber and Case Chase-Walton that contains integration of Transactional IS assume an enterprise-wide strategy to integration, partly due to the complexity of other integration forms. Point-to-point is used when there is limited integration of informational or infrastructural character. However, the enterprise-wide alternative is sometimes also preferred due to cost savings in maintenance and implementation.

DE2: D. IS ecology – E. Integration Architecture

Proposal: If the IS is business critical, then integrating with point-to-point or middleware could be preferred in favor of an enterprise wide system. Implementing a new enterprise wide system is a highly risky and complicated process. Integrating existing systems is argued less difficult and risky than a complete transition (Markus, 2000).
Findings: The Kléber-case confirms that a complete transition may affect the leverage of synergetic potential since the IS integration was postponed several years due to the complexity of introducing a new enterprise wide system at an acceptable cost.

EF1: E. Integration architecture – F. IS integration role

Proposal: A reactive approach is likely to transform existing systems rather than replacing them (McKiernan & Merali, 1995). If the IS manager is approached to fulfill an integration need after the deal is closed, the completion of the plans are often time critical as the pressure is high to recapture invested money.
Findings: The findings are only partially confirmed. The Kléber case, which followed a clearly reactive approach, did implement an

enterprise-wide system. However, the advantage of fast integration was considered in all processes as an important factor. It should be noticed that Trelleborg as an industrial organization during the years that the case studies were carried out, functioned in a financially sound way, presenting less stress and less pressure to fast leverage of synergies.

The research findings add complexity to the theoretically derived relations. As explained in the methodological section, relations in this kind of theory are more in the form of complex interdependencies rather than causal relations. By introducing the empirical data to the theoretical relations, all except two were strengthened. For BD2, the relevance of the relation is questioned since an IS match seems extremely difficult to achieve in reality. Regarding relation BD1 no cases addressed a hostile take-over process which could confirm or reject the existence of the relation.

8.3 Empirically identified relations

8.3.1 Relations in the Kléber-case

By combing the research findings from each individual dimension, the Kléber case presents an additional set of complex relations:

BD3: B. Organizational integration – D. IS Ecology
Finding: As the whole approach to the integration changed from absorption to symbiosis, this led to a new focus of IS integration. Rather than focusing on Information IS to achieve control, integration in Transaction IS was sought to leverage synergies and increase profits. The symbiosis approach favored other IS functionality more than the absorption strategy.

BE1: B. Organizational integration – E. Integration architecture
Finding: In the case, Trelleborg evaluated the option of doing required integration with middleware architecture. They found that the available technology, at the time of the late 90's, would not permit the tight integration they required. The finding is consequently that it is not efficient to undertake higher degrees of integration using middleware.

BF1: B. Organizational integration – F. IS integration role
Finding: When the new unit TIH acquired the hi-tech company, Dynaflex, it made use of its new platform as a proactive use of IS integration. The objective was absorption, and this was possible as the existing systems permitted inclusion of new organizational units, which was an expressed objective with the new setup. Proactive use of integration enabled smooth absorption.

CD1: C. Intention & reactions – IS Ecology
Finding: Regarding the process (in retrospection), the deal stabilization as collaboration resulted in a different functionality focus. The focus shifted from Information IS to Transaction IS.

The relations are graphically presented in Figure 8.1.

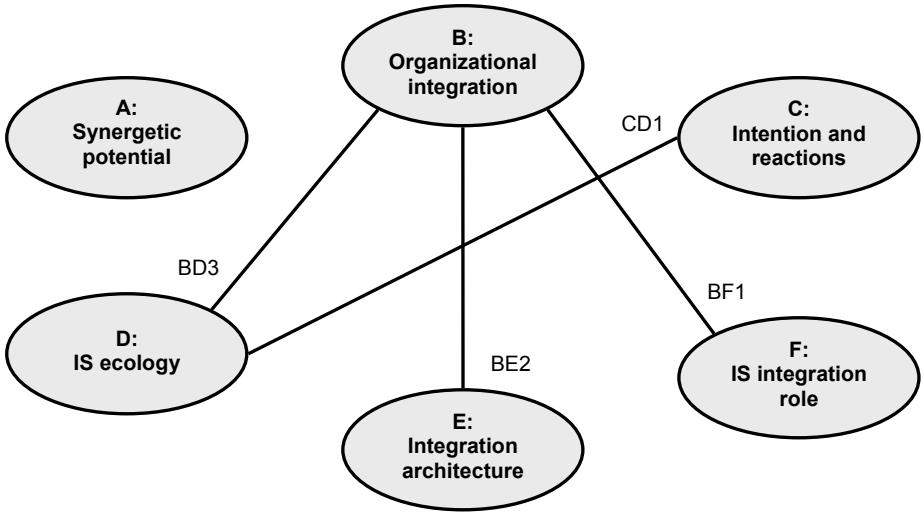


Figure 8.1. Identified relationships in the Kléber study

8.3.2 Relations in the Dynaflex case

In many aspects, the Dynaflex case represented a completely different story of IS integration in M&A even though, or perhaps because of, many of the same people were involved. Many of the changes in IS integration related decisions could be attributed to the managerial shift in approach to collaborative combination in the post-1998 period for the Kléber acquisition. Nevertheless, equal importance should be given to the circumstance that the very same people had just been through

the extensive work of creating the integrated TIH when the Dynaflex acquisition became a reality. The case clearly showed how the managers and IS professionals that were faced with the integration of Dynaflex benefited from their previous work in two ways. First, they had created an information infrastructure that was fairly flexible and extendable, that is, for anyone it would have been less resource demanding to integrate TIH and Dynaflex because of the quality of the existing systems. Second, the staff could use their specific knowledge gained in previous work. Managers knew how the system could be extended, what resources the option would demand, and how employees could be expected to react when shifting to the new system. For the IS professionals facing the actual integration work, they had the best education possible since they had been involved in creating and forming the processes that the system was built upon, and thus understood what could be reused.

In terms of the framework for IS integration, the Dynaflex case presents the proactive approach to IS integration; however, only the setup-component which means creating the potential for smooth integration of any acquisition, and how it affects the other dimensions are considered:

BD4: B. Organizational Integration – D. IS Ecology

Findings: When TIH acquired Dynaflex they did not want to destroy the specific value of Dynaflex, and saw little need to integrate business activities. However, they wanted transparency and the ability to control the progression of business. The solution was to integrate informational IS. When striving for preservation there is no need for integrating transaction IS.

BE2: B. Organizational integration – E. Integration architecture

Findings: Although Preservation was the chosen approach to organizational integration, TIH still went for Enterprise-wide integration. They did so not for integration reasons, but for standardization reasons. Implementing the same system was expected to be the most cost effective. The lesson learnt is that integration may come as a by-product, triggered by actions that are driven by other mechanisms.

DE3: D. IS type – E. Integration architecture
Findings: The view of IS at Dynaflex was that it was not strategic. Therefore, it could be replaced by reason of searching for cost savings. If it would have been regarded as strategic, it would have been risky to replace it.

EF2: E. Integration architecture – F. IS role
Findings: TIH had during the last decade developed a functional Enterprise-wide system that was fairly simple to transform and extend. Unless this system was in place, it would not have been possible to choose the Enterprise-wide integration architecture, as the short time frame would not have permitted bulky transformations.

The relations are graphically presented in Figure 8.2.

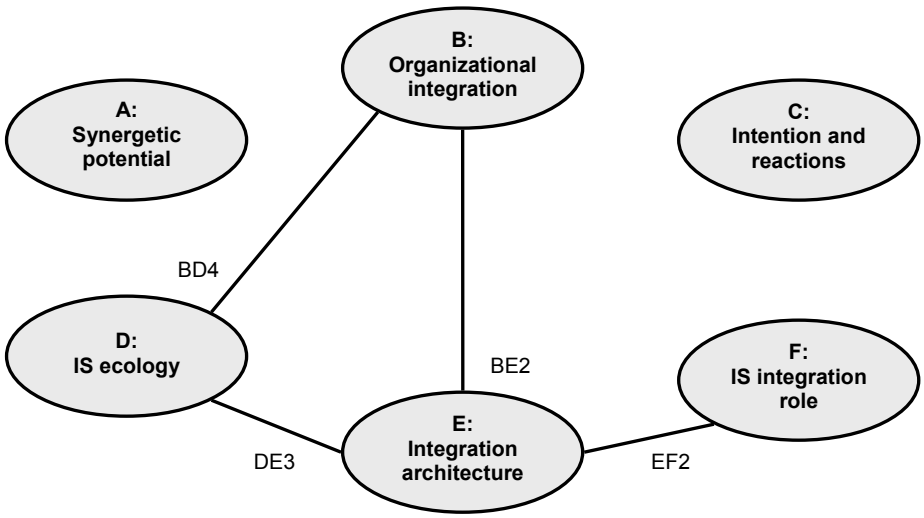


Figure 8.2. Relationships derived from the Dynaflex study

8.3.3 Relations in the CRP case

The acquisition of CRP group provides yet another picture of IS integration in an M&A context. The CRP-case had a somewhat different focus than the Kléber case. Expected synergies were fewer than in the Kléber case, which naturally had an impact on the level of integration as a whole. Compared to the Dynaflex acquisition, where also a limited set of synergies were sought, the CRP unit was substantially bigger. The difference of synergistic potential was found to

be the underlying reason for a new set of relations between different dimensions in the framework. By contrasting them to how the same issues were solved in the Dynaflex case, we find some explanations as to why the decisions went in the directions they did. The following relations were found in the CRP-case:

AD1: A. Synergetic potential – D. IS Ecology
Findings: Synergies were sought in sales, marketing and production development. But as only Infrastructural IS was implemented, these technological synergies could never be leveraged. This also confirms that IS integration has a significant role in the leverage of some synergistic potential, and the precise finding that for integration of Transactional IS, leverage of synergies in sales is needed.

BF2: B. Organizational integration – F. IS integration role
Findings: The striving for organizational integration was preservation. Preservation implies leaving the acquired unit mostly undisturbed, in terms of IS integration. As such, IS integration issues play a minor role and can thus be treated reactively.

CD2: C. Intentions & Reactions – D. IS Ecology
Findings: In the CRP-case only Infrastructural IS was integrated. The task was mainly of technical nature, IS integration was not required on an infological or organizational level. Therefore, the integration work was only affected by the M&A context to a very limited extent. The dimension of intention and reaction primarily refers to human reaction which is important when integration is needed in business processes.

DF1: D. IS Ecology – F. IS integration role
Findings: For the same reasons as mentioned above, integration in only Infrastructural IS was not severely affected by the general M&A characteristics and was not to a high degree affecting the outcome of the general process. Therefore, if integrating only Infrastructural IS, the IS integration can assume a reactive position without endangering the M&A initiative.

The relations are graphically presented in Figure 8.3.

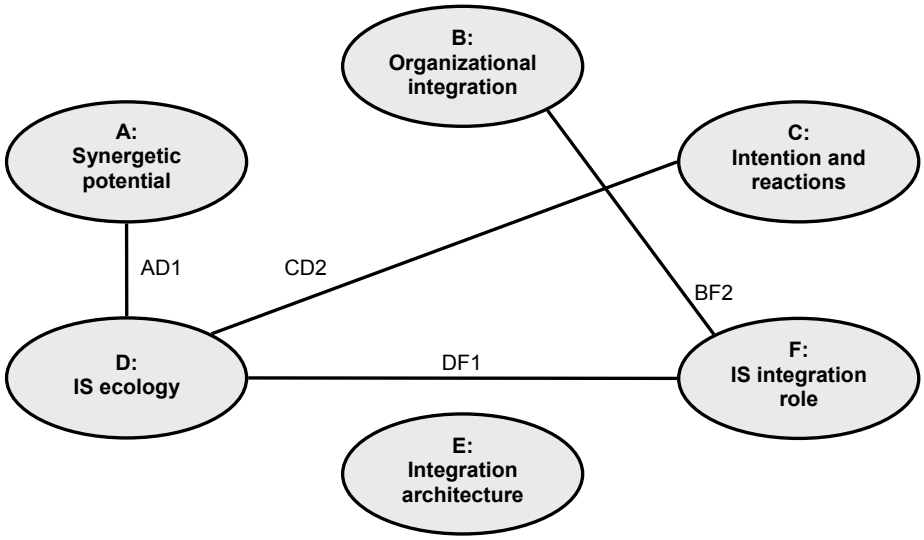


Figure 8.3. Relationships derived from the CRP study

8.3.4 Relations in the Chase-Walton case

The three previous cases, Kléber, Dynaflex and CRP, were all M&As that were made by the TES division of Trelleborg. As explained before, TES applies a fundamentally different business model than the division that acquired Chase-Walton Elastomers Ltd, TSS, and as depicted in chapters 2-4, that difference much off-sets the agenda for the IS integration in relation to the acquisition. The business model and thus accompanying IS structure enforced an enterprise-wide integration architecture for marketing and logistics activities; however, integration production activities may be implemented either by point-to-point, middleware or enterprise-wide architecture. For marketing and logistic, the division had a clear strategy that in some sense was depicted as proactive – the management had a clear view of how integration should be solved. For integration of production activities, plans were more reactive and case specific, even though the very final outcome was fairly clear in advance. IS had in production activities a downscaled role, being more of utility character. All in all, the Chase-Walton case proposes the following relations:

BE3: B. Organizational integration – E. Integration Architecture
Findings: At lower levels of integration, other drivers than the architectures enabling properties seem to be decisive, such as cost savings by standardization and knowledge of specific systems.

DE4: D. IS Ecology – E. Integration architecture
Findings: If the company strives for a higher degree of integration and at the same time regards the IS supporting that activity to be of importance, enterprise-wide integration is the choice. The less important IS becomes for the activity, the lower the degree of integration is gained for the lesser reason of going for enterprise-wide integration. This relation seems to be decided by architecture 'enabling' characteristics.

DF2: D. IS Ecology – F. IS integration role
Findings: Not all IS in a company are of equal strategic importance, and the degree of proactiveness in the Chase-Walton case was directly related to the importance of the IS. For activities where IS had an important function, leaning towards a dependent character, a clear plan was available. In areas where IS had a lesser important role, the integration could assume a more reactive process.

The identified relations are graphically represented in Figure 8.4.

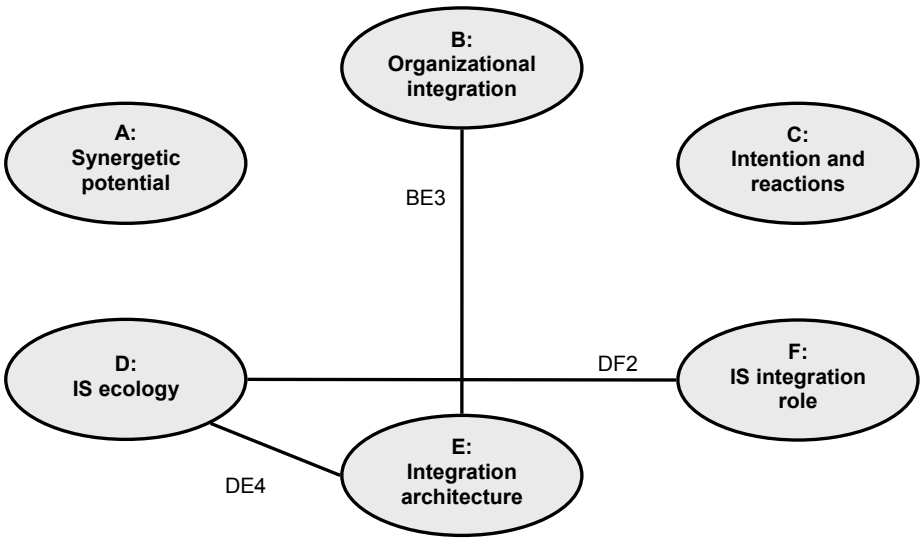


Figure 8.4. Relationships derived from the Chase-Walton study

8.4 Contribution of Chapter 8

In total, 23 ways in which IS integration relates to the M&A context were identified by describing the four cases along the six dimensions of the framework for management of IS integration in M&A. These 23 relations are presented below in Table 8.2 Summary of identified relations in the four cases of IS integration in M&A.

Table 8.2 Summary of identified relations in the four cases of IS integration in M&A

Relation	*Description*	*Source*
A. Synergetic potential – B. Organizational integration		
AB1	The degree and mode of integration should be dependent on synergies expected as a higher level of integration is resource demanding. In chapter three it was explained how different kinds of synergies were leveraged by different levels of integration. Leveraging monopoly synergies do not demand integration to the same extent as production or scheduling synergies.	(Haspeslagh & Jemison, 1991)
A. Synergetic potential – D. IS ecology		
AD1	Synergies were sought in sales, marketing and production development. But as only Infrastructural IS was implemented, these technological synergies could never be leveraged. This also confirms that IS integration has a significant role of the leverage of some synergetic potential, and the finding precise that to be integration of Transactional IS to leverage synergies in sales.	Case CRP
A. Synergetic potential – F. IS integration role		
AF1	A proactive use of IS integration enables more accurate synergy estimation and possibly identification of supplementary synergies As IS integration is a risky and cumbersome process it is a issue that have to be considered early in the process. If not, cost related to IS integration can rapidly overshadow the benefits of the integration. McKiernan and Merali even argue that sometimes relative easiness in IS integration could even be a reason to make an M&A.	(McKiernan & Merali, 1995).
B. Organizational integration – C. Intention and reactions		
BC1	Resistance among employees may cause integration problems. This makes a lot of sense. If one strives for higher degrees of integration, it is not a good idea to have the workforce opposing you. What Buono and Bowditch contributed was the insight of understanding when and why people oppose the integration in order to avoid such situations.	(Buono & Bowditch, 1989)
B. Organizational Integration – D. IS ecology		
BD1	Operational integration requires integration of the internal value chain, which requires heavy integration of Transactional IS. Functional integration, in turn, is related to integration of Information IS. The more complex dependency of operational units should make integration in Transaction IS more demanding in terms of resources and time, compared to Informational IS.	(Barki & Pinsonneault, 2005; Weill & Broadbent, 1998)
BD2	Stylianou et al. suggested that the IS fit as part of the organizational fit had significant impact on the resources needed for IS integration. Not only did they find that differences in the two companies' IS, had a negative impact on resources needed, but they also found that determining these differences and taking action upon the information	(Stylianou et al. 1996)

Relation	*Description*	*Source*
	prior to the M&A had a positive impact, which further strengthens the evidence that IS fit is significant in M&A.	
BD3	As the whole approach to the integration changed from absorption to symbiosis, this led to a new focus of IS integration. Rather than focusing on Information IS to achieve control, integration in Transaction IS was sought to leverage synergies and increase profit. The symbiosis approach favored other functionality more than the absorption strategy.	Case Kléber
BD4	When TIH acquired Dynaflex they did not want to destroy the specific value of Dynaflex and saw little need to integrate business activities. However, they wanted transparency and the ability to control the progression of business. The solution was to integrate informational IS. When striving for preservation there is no need for integrating transaction IS.	Case Dynaflex
B. Organizational integration – E. Integration architecture		
BE1	In the case, Trelleborg evaluated the option of doing required integration with middleware architecture. They found that the available technology, at the time of late 90's, would not permit the tight integration they required. The finding is consequently that it was not efficient to undertake higher degrees of integration with middleware architecture.	Case Kléber
BE2	Although Preservation was the chosen approach to organizational integration, TIH still went for Enterprise-wide integration. They did so, not for integration reasons, but for standardization reasons. Implementing the same system was expected to be the most cost effective. The lesson learnt is that integration may come as a by-product, triggered by actions that are driven by other mechanisms	Case Dynaflex
BE3	At lower levels of integration, other drivers than the architectures enabling properties seem to be decisive, such as cost savings by standardization and knowledge of specific systems.	Case Chase-Walton
B. Organizational integration – F. IS integration role		
BF1	When the new unit TIH acquired hi-tech company Dynaflex it made use of its new platform as a proactive use of IS integration. The objective was absorption, and this was possible as the existing systems permitted inclusion of new organizational units, which was one outspoken objective with the new setup. Proactive use of integration enabled smooth absorption.	Case Kléber
BF2	The striving for organizational integration was preservation. Preservation implies leaving the acquired unit mostly undisturbed, in terms of IS integration. As such, IS integration issues plays a minor role and can thus be treated reactively.	Case CRP
C. Intention & reactions – IS Ecology		
CD1	Regarding the process in retrospection, the deals stabilization as collaboration resulted in a different functionality focus. The focus was shifted from Information IS to Transaction IS.	Case Kléber
CD2	In the CRP-case only Infrastructural IS was integrated. The task was mainly of technical nature, IS integration was not required on an infological or organizational level. Therefore, the integration work was only affected by the M&A context to a limited extent. The dimension of intention and reaction primarily refers to human reaction which is important when integration is needed in business processes.	Case CRP
D. IS ecology – E. Integration Architecture		
DE1	If integration of Transaction IS, as suggested, is more demanding and requires deeper coupling than Informational IS, then it has consequences for selection of integration architecture. Integrating a whole operational chain with point-to-point architecture should logically be too complex. In this case a single system, not perhaps a	(Markus, 2000)

Relation	*Description*	*Source*
	complete Enterprise-wide, but at least some sort of "process wide" architecture can be claimed more suitable.	
DE2	If the IS is business critical, then integrating with point-to-point or middleware could be preferred in favor of an enterprise wide system. Implementing a new enterprise wide system is highly risky and a complicated process. Integrating existing systems is argued less difficult and risky than a complete transition.	(Markus, 2000)
DE3	The view of IS at Dynaflex was that it was not strategic. Therefore it could be replaced by reason of searching for cost savings. If it would have been regarded as strategic, it would have been risky to replace it.	Case Dynaflex
DE4	If the company strives for higher degree of integration and at the same time regards the IS supporting that activity to be of importance, enterprise-wide integration is the choice. The less important IS becomes for the activity, the lower the degree of integration strived for the less reason to go for enterprise-wide integration. This relation seem to be decided by an architectures 'enabling' characteristics.	Case Chase-Walton
D. IS Ecology – F. IS integration role		
DF1	By the same reasons as mentioned above, integration in only Infrastructural IS was not severely affected by the general M&A characteristics and did not to a high degree affect the outcome of the general process. Therefore, if integrating only Infrastructural IS, the IS integration can assume a reactive position without endangering the M&A initiative.	Case CRP
DF2	Not all IS in a company are of equally strategic importance and the degree of proactiveness was in the Chase-Walton case directly related to the importance of the IS. For activities where IS had an important function, leaning towards being dependent, a clear plan was available. In areas where IS had a lesser important role, integration could assume a more reactive process.	Case Chase-Walton
E. Integration architecture – F. IS integration role		
EF1	A reactive approach is likely to transform existing systems rather than replacing them. If the IS manager is approached with the issue to fulfill an integration need after the deal is closed, the completion of the plans are often time critical as the pressure is high to recapture invested money.	(McKiernan & Merali, 1995)
EF2	TIH had during the last decade developed a functional Enterprise-wide system that was fairly simple to transform and extend. Unless this system was in place, it would not have been possible to choose the Enterprise-wide integration architecture as the short time frame would not have permitted bulky transformations.	Case Dynaflex

The preliminary theoretical framework was created as a means to describe decisions made, show the motivations for the decisions, and explain the consequences of the decisions made. The output of Chapter 7 was four stories in which these issues were studied and presented using the framework. In Chapter 8 the decisions and their consequences have been combined into a set of general mechanisms, called relations, representing and understanding how IS integration relates to M&A.

In the next chapter, the discourse will take a step back, reconsidering the usefulness of the framework to create this understanding and evaluating how it could be improved.

9. Reconsidering the framework: towards an IS integration model

In this chapter, the discourse can be said to take a step back, analyzing the findings made thus far and their implications for the preliminary framework. Each of the dimensions of the framework are evaluated and reconsidered, based on predefined criteria. Also, the relations found are evaluated and reconsidered. The chapter also introduces an extension of the framework, not foreseen at the time of constructing the preliminary framework. Finally, based on the revised dimensions and relations between the dimension, an attempt is made to create an initial model of IS integration in M&A.

9.1 Revising the six dimensions

Chapter 6 introduced the preliminary theoretical framework that was used during the case studies. The framework went through a number of major and minor revisions during the course, sometimes even several different versions coexisted in parallel. Alternative definitions of key concepts, inclusion of complementary models and dimensions, as well as exclusion to maintain simplicity, have been a part of analytical activities. The version of the framework as presented in Chapter 6 was settled before the first case study and was transformed into the interview guide (attached as Appendix D). In this section conclusions from trying to apply the dimensions on four real world cases, major detours and possible as well as required modifications are amalgated. The progression as depicted in this thesis with tentative framework, case studies and modified framework was naturally more iterative and emergent in nature, but for readability the development is presented in a more simplistic and straightforward manner.

The methodological part of this study discussed which conditions to evaluate and how to revise the framework. It was concluded that it should be assessed by three conditions: explanatory potential, distinctiveness and simplicity (see section 5.6). The six dimensions of

the framework are here evaluated from these three conditions and based on the evaluation, some changes are suggested to increase the effectiveness of the framework.

9.1.1 Dimension A: Synergetic Potential

The framework's first dimension was directed towards the potential benefits after a combination of the two firms. As this field is relatively well researched, an existing typology developed by Lubatkin (1988) could be used. The typology is an amalgated view of proposed synergies in the at that time existing M&A literature. As criticism to the typology, it can be contended that it is almost 20 years old and its founding elements are even older. One serious concern is that research can have come up with further suggestions on how to create synergies by relating two organizations to each other. However, when working with the existing cases, the expressed reasons why the acquisition is undertaken can be fairly easily mapped into Lubatkin's categories. The categories are discrete and built on fundamentally different principles that hardly ever pose the question whether one potential benefit should be categorized in group X or group Y. In the case studies, it was also possible to identify relations to the other dimensions in a not too incongruous manner. Therefore, regarding distinctiveness and explanatory power, the typology by Lubatkin fulfills its role.

When it comes to simplicity, one question arises regarding the usefulness of all categories. During the 1980's, portfolio theory had a strong position within diversification strategy and contemporary business. Trelleborg AB is one example of how business organizations spread their activities in several different industries to reduce risk. At that time categories related to portfolio management were essential to explain why companies engaged in M&As. In the four cases above, none of them was driven by the portfolio related aspects as risk reduction, and regarding the general trends of contemporary business, companies are still generally moving away from highly diversified businesses and focusing on more consolidated activities. Therefore, one might question the need to incorporate categories that at least currently do not fulfill any need. The reason to do so would be that business trends come and go, and if the framework retains its explanatory potential in the future, one might consider retaining the categories. If the typology by Lubatkin had been a conceptual diversification of the

synergy issue based on specific determinant variables, then this researcher would have suggested the incorporation of portfolio related categories. As now the Lubatkin typology was amalgated, constructed from the bottom up by investigating the existing theories, omitting these categories was suggested. The typology is more of a collection of mechanisms rather than a conceptually derived differentiated taxonomy based on certain determinant variables. Although the portfolio ideas might be relevant in the future, as the pendulum swings back, it is just as likely that the dimension needs extension in another direction, including potential synergies yet uncovered by existing research. In addition to the perhaps limited use of portfolio theories in general, the synergies they present do not relate to any IS integration needs. In the cases no such relations could be found (with recognition that diversification economies overall only played a marginal part and its relations may thus been hard to capture). Logical reasoning drawing upon the synergy-mechanism of portfolio theory strengthens the view that the absence of relation diversification synergy- IS integration would not be a coincidence. The factors behind portfolio theory have nothing to do with integration. The dimension thus contains the concepts of *technical* (*marketing, production, experience, scheduling, banking,* and *compensation*) and *pecuniary* (*monopoly, monopsony*) economies.

9.1.2 Dimension B: Organizational Integration

Into the second dimension of the framework, conceptualizations that captured distinctive features of OI in the M&A context were incorporated. The interpretation of OI is to some extent distinctive from the general conceptualization. Apart from the differentiation into operational/functional activities and reciprocal, sequential, and pooled dependency intra organizational integration could in the M&A context also include a cultural difference which needed to be accounted for. A refinement of the OI concept from an M&A point of view also emphasized the need of different integrational levels in order to capture the empirical phenomenon. Not in all M&As was complete integration desired. These four categories, Degree of integration, Dependency, Activity and Cultural Difference, were used to map the integration work needed in the four cases, on an organizational level. The experience was that all categories provided substantial support in

explaining how the general M&A integration related to IS integration. For example, the reciprocal dependency of operational units in the Kléber case explained the complexity of using Middelware-architecture, the functional integration of some activities in the Chase-Walton case explained the relatively loose conception, low integration level in the CRP acquisition was related to only a limited set of synergies pursued, and finally the cultural differences played a significant part in the IS integration in the Kléber case. Hence, all concepts contribute with significant explanatory power and cannot come in question for omission due to simplicity reasons.

9.1.3 Dimension C: Intentions & Reactions

The friendliness-hostility continuum originally developed by Pritchett (1985) was useful to explain some of the reactions in the Kléber case. It could also be related to Trelleborg's overall strategy for successful businesses. Of the concepts originally incorporated into the Intentions & Reactions dimension, the least used in the presentation of the cases were related to human reaction to the M&A. This could be explained by several causes, not automatically meaning that the concepts being insignificant could be used to explain what is going on. First, the methodological choice of primarily interview based case studies limit the discovery of reactions. If the study's primary focus had been employee resistance and reaction, then probably an ethnographic field study would have been recommendable. Also, as the focus was on management issues, the study principally sought empirical data from a managerial perspective which could partly explain the relatively sparse information on employee reaction. Therefore, the conclusion is that the concepts should be conserved in the framework, as it is a methodological limitation, rather than a shortcoming of the concepts explanatory power, that renders the relative insignificance in these case studies.

As for simplicity and distinctiveness, the friendliness-hostility continuum leaves something to desire. The continuum serves as a good indication of which kind of power relations exist between the two parts in the M&A. When using the classification it becomes apparent that the continuum, rather than being built upon one single discriminant variable, assumes the form of a set of type-M&A, based on a number of characteristics. The borders between the different categories are

somewhat fuzzy, and in the four cases above, the M&A possessed properties that could place them in several categories. The continuum thus serves the use of discussion and analysis, but it is not perfectly suited for drawing relations to other dimensions. The contributing variables and the continuums operationalization needs to be further elaborated, but in absence of an alternative, the conceptualization is left in the framework, as it addresses a significant part of M&As. Thus, there are no suggested changes to dimension C: Intentions & Reactions.

9.1.4 Dimension D: IS Ecology

Based on the view of IS as a heterogeneous phenomenon and that significant differences exist between different kinds of IS that would have impact on the IS integration, a typology of IS was incorporated into the framework as the fourth dimension. The typology showed significant contribution that integration of only Infrastructural IS was the major determining factor of the CRP integration. Although the explanatory power was high, limitations were experienced in distinctiveness. Classification of encountered systems in the cases was hard, many systems falling in between the categories or sometimes potentially into two or more categories. The problem seems to be that the construct used for classification is multidimensional and only partly operationalized. On the one hand, there is the distinction between systems that support operational or functional activities (compared to the discussion on organizational integration above), and on the other hand, the strategic importance of the system to the company. For example, in the Chase-Walton case the transactional system covering the marketing and logistics activity was not only a transactional system but also of some strategic importance. On the other hand, the transactional system of production was of less strategic importance. Comparably, the transactional system of production in Trelleborg Industrial Hose (the combined unit in the Kléber case) was of significant importance to leverage the expected synergies in that case.

The experiences from the case studies entail an elaboration of the IS typology to diversification in categories based on 1) whether operational or functional activities are supported by the IS, and 2) the strategic importance of the IS. The classification into operation vs. functional is important, as it was shown that integration of operational

units required more elaborated coupling than integration of functional units (Barki & Pinsonneault, 2005). Classification of strategic importance is needed as IS of different importance needs to be taken care of differently, according to the case studies. If the IS is of minor importance, like the production system in the Case-Walton case, it can be dealt with reactively, but if integration would be business critical it has to assume a proactive role. Broadbent & Weill (1997) provide an earlier, somewhat different taxonomy that they label 'view of IT infrastructure.' With the strategic purpose of the organization in mind, this view should be seen as the way that an IS supports the coordinating actions across resources striving towards the business strategy. These are None, Utility, Dependent and Enabling; they more specifically reflect the level of alignment, or strategic fit, between the business and the IS.

The *None* alternative implies that no shared services are used and no investments are made to achieve a higher level of coordination. *Utility* alternative is equal to the sharing of common resources and is largely driven by economies of scale (Broadbent & Weill, 1997) as the increased usage of resources as higher output is accomplished by the same input. No coordination of knowledge is however necessary. The *dependent* option implies an increased focus on IS services, as they represent key factors in current business strategies (Broadbent & Weill, 1997). These investments are derived from actual business plans that specify or in other ways imply IS requirements in terms of need of coordination across organizational boundaries. Finally, *enabling* represents an overinvestment in terms of current needs (Broadbent & Weill, 1997). The key idea is to provide flexibility by state-of-the-art technology and a leading position in the industry. This view is particularly dominant in industries heavily dependent on R&D.

The above view implies that the strategic view is derived from the business value that it creates and, as such, the resources that it complements. However, the explicit purpose as stated by the authors is the view on infrastructure with a focus on investments. Weill & Broadbent (1997) also note that these views require a firm wide view of the business on behalf of the part that implements the views. If this is not achieved, an alternate, and more common, route can be pursued - IS by deals rather than maxims. In this model the IS department of a firm functions as an independent profit center that strikes deals with different business units and supplies them with the services they need at a given price.

9.1.5 Dimension E: Integration Architecture

As recognized already in chapter 2, which introduced the architectural side of IS integration, a real project is most likely to present a mixture of the idealized principles P2P, Middleware, Enterprise-wide, Meta-level, and SOA. Nevertheless, important relations between the use of architectural principles in certain M&A settings were possible to identify in the case studies. As none of the cases covers approaches to SOA, the related concepts cannot be determined. Not much is to be said on the dimension of Integration Architecture, the concepts serve their task well in explanatory power and simplicity, as well as distinctiveness. In addition, no real alternative exists which naturally leaves the decision to maintain the dimension as is even easier.

9.1.6 Dimension F: IS Integration Role

In the preliminary theoretical framework a distinction was proposed with respect to the role of IS integration in the M&A process. Two alternatives were proposed based on McKiernan and Merali (1995). Either IS integration could be used reactively, which was found to be the normal approach of contemporary business, meaning that once the deal was closed and potential synergies and barriers determined, the task of IS integration commenced. IS was not seen as a source of synergy, nor a significant barrier for its leverage. The alternative, as proposed by McKiernan and Merali (1995), was to introduce IS and IS integration in the due diligence phase. Synergies as well as barriers could, they argued, be found also in IS. Therefore, the compatibility of IS should be determined prior to sealing any deal.

Working with the empirical material reveals, however, a somewhat different story. To the knowledge of the author, no scientific studies of IS integration used proactively exist. It is thus easy to argue the inappropriateness of reactive IS integration, but it is not possible to argue that a proactive approach, according to the definition of (Merali & McKiernan, 1993), would solve the current problem or even be possible to implement in practice. In the case stories presented here, well informed managers actively chose to ignore IS integration issues during the due diligence phase. The cases also give indications that the most important work, in order to increase chances for smooth IS integration in the M&A, would not be made in direct connection to the M&A itself. Rather, what seems to be of greatest importance is the

potential within the company to carry out an integration at the time of closing the deal, that is, some kind of IS integration capability.

Comparing the Kléber and Dynaflex cases, they present completely opposite pictures of how demanding an IS integration can be. Some of the differences can, of course, be ascribed to the magnitude of integration work since Kléber was a much greater acquisition in size than Dynaflex. Important differences can, however, also be found in the setup before commencing integration work. As TIH became responsible for IS integration of Dynaflex, the integration project became the concern of the very same individuals that just were about to conclude the integration of the whole TIH organization. As such, they could use their personal experiences from rolling out the Movex system in all previous locations. They also had a profound understanding of the business logic that was built into the system and could foresee how business at Dynaflex was about to be affected by an implementation. Thus, neither the Kléber nor the Dynaflex acquisition used IS integration proactively in the sense of including IS match into the due diligence phase, but the Dynaflex case included an proactive element in the sense of improving the preconditions for IS integration. The very same set of thinking can also be found in the TSS unit and expressed in their acquisition of Chase-Walton. Neither did TSS include an IS match in the pre-M&A phase, but created a relatively easily extendable information infrastructure with potential inclusion of acquired units.

To overcome the mismatch of theory and practice and to increase the explanatory potential of the dimension, it should be acknowledged that the dimension needs to be extended with a third approach to IS integration. The proactiveness concept needs to be refined into two distinct categories, one that means incorporating IS into the due diligence phase and examining the match of the existing system. An additional category of proactive measures would be to enhance the conditions for IS integration in any kind of M&A, that is, improving the IS integration capability. What exactly this IS integration capability consists of is something that will be returned to in the next chapter when trying to restate the explanatory theory into theories for action.

9.1.7 Summary of evaluation and suggested changes

After the evaluation of the six dimensions according to the predefined conditions, it can be concluded that the dimensions generally served

their purposes well. Three of the dimensions (B. Organizational integration, C. Intentions & Reactions, E. Integration Architecture) could be left unchanged, partly because of lack of alternatives. Of the remaining three dimensions, one (A. Synergetic potential), could be simplified due to an unnecessary classification concept (Diversification economies) that did not link to IS integration. Dimension D, IS Ecology, turned out to not live up to the condition of explanatory potential, as it missed relating its constituting characteristics to the M&A phenomena. The original classification was too simplistic, and an increased complexity by dividing the concept into its constituents: 1) supported activity, and 2) strategic importance of IS to that activity increased both distinctiveness and explanatory potential. Finally dimension F, IS integration role, also had to be reconceptualized since the empirical data clearly pointed to a third approach, that is, to IS integration, in addition to the two described in the literature. In the cases, proactive measures were taken not by including IS integration into the due diligence phase, but to prepare the existing information infrastructures in a way that made them extendable when required. Table 9.1 summarizes the evaluation and the suggested changes to the framework.

Table 9.1 Summary of evaluation and suggested changes

Dimension	*Explanatory potential*	*Distinctiveness*	*Simplicity*	*Suggested Changes*
A: Synergetic potential	Useful to capture many relations to other dimensions	Clear boundaries and smooth categorization	Unnecessary concept (Diversification economies)	Suppression of diversification economies
B: Organizational Integration	Enables depiction of several relations	Relatively clear	All concepts and categories useful	None
C: Intentions & Reactions	Not perfect, difficult to relate	To some degree fuzzy	The usefulness of all categories can be questioned	None, partly because lack of alternatives
D: IS Ecology	Fails to relate categorization determinants to other dimensions	Many IS difficult to categorize, falls between categories or applicable to several categories	In theory a nice and straightforward categorization	Reconceptualization based on a) supported activity, and b) strategic importance of IS to that activity
E: Integration Architecture	Provides several interesting relations	Some phenomena falls in between categories	Some concepts unused, but with future potential	None
F: IS integration role	Did not capture all empirical situations	Clear categories	Easily understood and operationalized	Added category: Improvement of IS integration capability

9.2 Extending the frame with a meta level

With respect to the existing literature on IS integration in M&A as presented in Chapter 4, none of the existing studies address more than one M&A by the same company. Studies show that effects of M&As are far reaching and may prevail for up to 10 or even 20 years (Levinson, 1970). Still the existing single-case studies (Alaranta, 2006; Alaranta, 2005a; Henningsson & Carlsson, 2006b), multiple case studies (Wijnhoven et al., 2006; Mehta & Hirschheim, 2007) and statistical analyses (Robbins & Stylianou, 1999; Giacomazzi et al., 1997; Stylianou et al., 1996) all present instant snap-shots that lack a longitudinal progression. It is thus not surprising that existing research has failed to give sufficient recognition to the improvement of preconditions for IS integration and the role of an IS integration capability.

The absence of studies covering potential progression within a company is logical if regarding M&A from a historical perspective. For almost a century, however, the phenomenon has been that of coming and going art. Companies engaged in one M&A and settled into its new costume. 10 or 20 years later activity increased, once again introducing the organization to the potentials and disadvantages of M&As. Today companies frequently engage in M&As and are likely to have several processes running at same time. Thus, M&As have to be addressed in a wider frame as part of a company's ongoing business and not as an extraordinary single event.

The framework presented as preliminary theoretical framework at the beginning of the chapter and with suggested changes thus far enables explication of many aspects of the single M&A case. It does, however, not recognize the importance of improvement over time. Companies who adopt frequent M&As as an integrated part of their growth strategy also need to develop a capability of taking care of the related IS integration. Each acquisition needs to be accompanied with organizational learning processes that enable performance enhancements in the future.

In large multinational companies, the learning is more problematic as many acquisitions tend to be carried through by subdivisions on a national or regional level. With the outspoken ambition to provide knowledge of how the relationship between IS integration and M&A can be managed, the framework has need for a

completely new dimension which focuses the changes over time, from one M&A to another. In relation to the other dimensions of the framework, this is a meta dimension. The existing six dimensions still form the suggested framework to analyze an individual M&A. The framework can also be used to compare two or more consolidations; however, to understand how changes occur over time, there is a need to turn to the theories of organizational learning.

9.2.1 Organizational learning and IS integration in M&A

To understand how the organizations can develop their IS integration capability, we must understand which learning processes take place, or could take place, when undergoing this kind of change process. Learning processes in the context of organizational change may be grouped into cognitive and behavioral processes (Henningsson & Selander, 2007) Both aspects are vital to capture the progression. To advance from theory that explains the dynamics of IS integration in M&A to prescriptive theory that makes suggestions on how to manage this interrelation, this study uses "mid-range" theories of organizational learning (c.f. Cross et al., 2001), balancing both cognitive and behavioral processes of learning theories. The objective is not to enhance the theories of organizational learning, but rather by incorporationg theories of organizational learning, to increase the explanatory power of the framework.

In this research, with an IS integration perspective, the learning processes of interests are adapted from Selander (2008). Selander investigated organizational learning processes in larger IS implementation, and as a part of her research, developed a theoretical framework for describing these processes. Selander found three learning processes of interest: first, the processes of "single and double loop learning" (Argyris, 1974), second, that of "explorative and exploitive learning" (March, 1991), and last, the discussion of "externalization and internalization" (Nonaka, 1994). The three concepts are summarized in Table 9.2 and discussed below. The adaptation from IS implementation to IS integration process was discussed by Henningsson and Selander (2007).

Table 9.2 Processes and main factors from organizational learning literature

Processes	*Main Factors*	*Indicative References*
Double and single loop learning	Norms and values, detection and correction of errors, feedback, reflection, goals, plans and rules.	Argyris and Schön, 1974, 1978, 1996 Edmondson and Moingeon; 1999
Exploration and Exploitation	Structure (Loosely or Tight) Search, variation, risk taking, experimentation, play, flexibility, discovery, innovation, refinement, choice, production, efficiency, selection, implementation, execution bounded rationality	March, 1991; Levinthal and March, 1981; Weick and Westly, 1996, Cyert and March, 1963; Simon, 2001; Weick, 1979
Externalization and Internalization	Willingness, Autonomy, Fluctuation	Nonaka, 1994; Nonaka and Takeuchi, 1995

According to Argyris (1976), learning is dependent on the relationship between the individual and society. Learning occurs when insights are gained on errors and followed by actions. Argyris (1976) differentiates between two types of learning: single- and double-loop learning. In single loop learning an error is corrected through an action or change in behavior. For IS integration in M&A, this would include things like understanding that point-to-point integration becomes complex for intensive integration or that some synergies are harder to leverage than others. Double loop learning represents a change in the underlying values for action. For example, giving higher priority and recognition to IS integration issues in the M&A process, or reconsidering the perceived need for organizational flexibility and self independence of organizational units. The difference between single- and double-loop learning is thus that single loop learning signifies an instant alteration in behavior to solve a specific problem, and double loop learning a reflective process upon all errors that occur and how new errors can be avoided in the future. In managerial terms, Argyris (1976) points out the cognitive processes of the individual and suggests that learning could be manageable in normative ways. Organizational effectiveness could be improved by better knowledge and understanding by individuals (Argyris, 1974; Fiol & Lyles, 1985).

The use of existing knowledge to change organizational behavior is by March (1991) referred to as exploitive learning. Exploitive learning has been referred to in the literature as single loop (Argyris & Schön, 1978), being of an evolutionary and reactive character (Orton & Weick, 1990). According to March (1991), exploitive learning should be distinguished from explorative learning, the process in which an

organization adopts behavior that basically differs from existing practice. If exploitive learning is evolutionary, explorative learning is revolutionary in its progression. Exploration relates to activities such as search, variation, risk taking, experimentation, play, flexibility, discovery and innovation. Exploitation, on the other hand, is related to refinement, choice, production, efficiency, selection, implementation and execution (March, 1991). Tightly coupled structures, as in stable organizations, are likely to foster exploitive learning, while loosely coupled structures are more likely to develop explorative learning (Weick & Westley, 1996). Organizations approaching SOA to find out whether it facilitates IS integration in M&A (to the extent that it is promised by its advocators) can be said to be approaching explorative learning processes. Establishing best practice based on lessons learnt from previous M&As may be seen as an activity related to exploitative learning. The problem of balancing exploration and exploitation could also be exemplified in an IS integration context by the organization that stands between the decision to refine an old information system solution (exploit) or to approach a new one (Levinthal and March, 1981). Decisions between exploitive or explorative processes are complicated by what has been labelled 'bounded rationality' (Weick, 1979). The concept of rationality per se entails that organizational actions are intended, thought about, planned, calculated or designed for a purpose (Weick, 1979). Bounded rationality implies that it is difficult, if not impossible, to optimize an organization in such a way (von Simons, 1995).

Improving the IS integration in M&A is dependent on the spreading of new knowledge. Nonaka (1994) argues that there are four modes of knowledge transfer between individuals and groups: tacit to tacit, tacit to explicit, explicit to explicit, and explicit to tacit (see Nonaka & Takeuchi, 1995). Tacit knowledge can be transformed into explicit knowledge through externalization (Nonaka. 1994). The creation of new knowledge is, according to Nonaka (1994), dependent on individual conviction and involvement in the learning processes, that is, learning requires willingness, autonomy and fluctuation. The autonomy factor concerns the possibilities to act within loose frames of structure. The interpretation of fluctuation, on the other hand, could be compared with changes or instability that requires a change in behavior, leading to a learning process. In the case of IS integration in M&A, individuals involved in the process have the possibility of

increasing their understanding as they experience the implications of decisions taken. This gained knowledge is, however, often of tacit character and limited to specific individuals. Finding ways of transferring insights gained in one M&A process from individuals or groups within the organizations to others can be seen as transfer of tacit knowledge.

9.2.2 Applying OL on the research findings

The four M&As by Trelleborg presented in this thesis are all part of the growth strategy by Trelleborg. One by one, the cases provide relevant insights on the learning processes that take place in the context of IS integration in M&A, but additional insight can also be drawn from relating the individual cases to each other and to their role in a corporate strategy. I structure this section according to the theoretical baseline of organizational learning theory since I believe that this is what best highlights the specific and generic aspects of learning in the presented cases.

The case of CMP/Kléber illustrates how difficult, expensive and time consuming integrating IS might be. Also, it reveals the cultural differences between the two organizations. The differences in IT infrastructure, as well as the decision to replace management, created instability and a lack of shared norms and values. Dynaflex, on the other hand, experienced a much less complicated integration process. Why was this? Naturally, the short integration time could be explained by the approach chosen to integrate Dynaflex into the IS of TIH. More so, the Dynaflex integration turned out to be the result of a double learning process as the IS integration of Dynaflex became the concern of the same person that was to conclude the integration of the whole TIH organization. With the understanding of the system per se, as well as earlier experiences from rolling out the Movex system, the organization had gained a profound understanding of how Dynaflex would be affected by the implementation.

Decentralization clearly works as an inhibiting factor in that information awareness is limited. The decentralized structure also manifests itself in the problems of assuming double loop learning at a corporate level. Individual units may undergo this second loop, but the knowledge in our study was not communicated to the mother organization. Trelleborg implemented a corporate IT group in which

these issues could be dealt with. The pure existence of such a group will, however, not provoke double loop learning. During the timeframe we recognized clear signals showing that the group did not fulfill this specific purpose very well.

Existing phase models of M&A's hold true for the integration process being formal, rational and straightforward. This set of thinking is also transmitted to IS integration process research in the context of M&A. For example, McKiernan and Merali (1995) apparently make this assumption when they suggest that the required IS integration and resources needed to implement integration should be assessed prior to the deal during the due diligence phase. Relating back to the discussion of bounded rationality, this formalized and normative way of planning and integrating IS often holds some sort of impossibility. We know that the possibilities of acting rationally are dependent on knowledge awareness and the possibilities of internal learning. In a decentralized organization such as Trelleborg the difficulties of sharing and exploring new knowledge does not come as a surprise, as in the case of CMP/Kléber, where the integration process became protracted and complicated. More so, the fear of exploring new knowledge at the expense of exploitation could again be exemplified by the CMP/Kléber case of deciding to modify the existing system rather than exploring new ones, in fear of the millennium shift.

In the four cases the decentralization of the organization and the tightly coupled structures within the integrating organizations did not allow for exploring new knowledge. Rather, they unintentionally fostered exploitive learning, being less willing to change. This, again, could not be solved only by means of restructuring, but rather through emphasizing information awareness characterized by autonomy and willingness. Trelleborg had fostered a reactive rather than proactive approach towards IS. As such, IS was considered only as necessary support systems. Understanding the process of IS integration not only requires a supportive organizational context, but also recognition of the difficulties that rest within the thought of rationally structuring the IS integration process. Beholding this arduousness opens up for exploring new knowledge as well as the possibility of double loop learning.

The CRP group's IS integration was, as in the case of CMP/Kléber, characterized by the lack of externalization of knowledge leading to limited integration possibilities and effects. In the three cases discussed, we found that the different outcomes of the IS integration

efforts, to a large degree, were dependent on the knowledge of the personnel at hand. In effect, the decentralization of the organization hampered a corporate strategy for IS integration which led to few possibilities of exploration of new knowledge or double loop learning.

There are many aspects of externalization and internalization that seem relevant to explaining learning in our cases. First, it has several times being argued that no M&A is similar to any other M&A. The usefulness of information is determined by the setting. If every acquisition responds differently to decisions taken, prior experience is logically of minor importance. One of the major reasons why specific M&A and integration projects substantially differed from each other in the Trelleborg case was because of the heterogeneous information infrastructure. In the case of Dynaflex, the integration project was similar to several previously made integrations, and management could therefore use its understanding of the systems and processes. Second, Trelleborg do not externalize their knowledge of IS integration in M&A, making it rather specific to certain individuals. Whether this is because of the nature of the knowledge involved in the process or because no initiatives have been taken is not covered by the study data. However, it is apparent that IS integration in M&A is a far too complex issue to ever deal with in "cook-book style," but this is not to say that IS professionals cannot be supported by various tools in their work. Third, there is a need to relate to new norms and values, namely, understanding and realizing that IS integration challenges and changes the working environment. Relating to new norms and values by corporate communications and understanding the new strategy may threaten the members of the organization with an underlying risk of losing valuable tacit and explicit knowledge.

9.2.3 Relations between framework and meta level

Whereas the six original dimensions of the framework could be directly related to each other, summarizing the analysis above depicts relations where the original six dimensions act as a system that as a unified whole have relations to the organizational learning. That is, it is not the specific characteristics of each dimension that have interdependency with organizational learning, but rather a set of characteristics within the original dimensions. A certain configuration of the characteristics relates to the meta level. Summarizing the above discussed

interdependencies, we can present them as five additional relations. To clarify that the relations are from the longitudinal dimension of organizational learning, they are from now on labeled: "Dimension L: Improvements and Organizational Learning," and the six original dimensions as unified whole, the relations are numbered L-[AF]x, with x being a number.

L-[AF]1: Decentralization works as an inhibiting factor in that information awareness is limited. The decentralized structure also manifests itself in the problems of assuming double loop learning on a corporate level. Individual units may undergo this second loop but the knowledge in our study was not communicated to the mother organization. Further, the decentralization of the organization and the tightly coupled structures within the integrating organizations did not allow for exploring new knowledge. Rather, they unintentionally fostered exploitive learning, being less willing to change. This, again, could not be solved only by means of restructuring, but rather through emphasizing on information awareness characterized by autonomy and willingness.

L-[AF]2: Heterogeneous information architecture makes it harder to draw general conclusions from one M&A to another since the organizational parameters change and pose different requirements on the IS integration. In the case of Dynaflex the integration project was similar to several previously made integrations and the management could therefore use its understanding of the systems and processes.

L-[AF]3: Trelleborg do not externalize their knowledge of IS integration in M&A, making it rather specific to certain individuals. Whether this is because of the nature of the knowledge involved in the process or because no initiatives have been perused is not covered by the study data. However, it is apparent that IS integration in M&A is a far too complex issue to ever deal with in "cook-book

style," but this is not to say that IS professionals could not be supported by various tools in their work.

L-[AF]4: A need to relate to new norms and values. Understanding and realizing that IS integration challenges and changes the working environment. Relating to new norms and values by corporate communications and understanding the new strategy may threaten the members of the organization with an underlying risk of losing valuable tacit and explicit knowledge.

L-[AF]5: Exploring new knowledge. A fostered reactive rather than proactive approach towards IS, meaning that IS is considered only as necessary support systems, may lead to alternative ways of carrying out integration that have not been discovered. Understanding the process of IS integration not only requires a supportive organizational context, but also recognizes the difficulties that rest within the thought of rationally structuring the IS integration process. Beholding this arduousness opens up the exploration of new knowledge as well as the possibility of double loop learning.

9.3 Towards a model over the dynamic system of IS integration in M&A

The existing research on IS integration and M&A was amalgated and integrated into a tentative framework for IS integration in M&A. The framework was used as a theoretical foundation in four case studies. In these case studies a number of ways in which the components of the framework, the dimensions, related to each other. Based on the studies and the relations found, the framework was evaluated with respect to its desirable use. The evaluation pointed out some advantageous modifications to the existing dimensions. During the course it also became clear that the existing dimensions were insufficient to explain significant parts of the relationship between IS integration and M&A. An additional dimension was required, that is, a meta-level-dimension, relating the IS integration in individual M&As to the organizations

other M&A projects. We return to the stated purpose in chapter 1 which was to "*develop theory that explains the relationship between IS integration and the general M&A process.*" To fulfill this purpose, two formal research questions were introduced:

> R1: Which aspects of IS integration and M&A are important to understand the IS integration in M&A?
>
> R2: How do the different aspects of IS integration and M&A relate to each other?

The tentative framework for IS integration in M&A that originally was amalgated from existing theory and later revised and extended by analyzing the empirical material is the answer to research question 1. In the existing literature and in the empirical data, 23 unique ways of which characteristics of IS integration relates to characteristics of the M&A process have been identified. These are the answer to research question 2. It should be noticed that the identified relations not by any means can be argued to be the only ones existing. What can be argued is that they exist in their specific context and have different degrees of general character.

The first purpose of this thesis is set out to "develop theory that explains." What theory is, and what is not can be debated. As discussed in relation to the presentation of the purpose in Chapter 1, "theory that explains" draws on Gregor (2006) who identifies one type of explanatory theory as a contribution that makes sense of how and why certain phenomena occur. It can be seen as theory for understanding, in this case, understanding how IS integration relates to the M&A context. Combining what in this thesis has been found as answers to research questions R1 and R2, it is possible to create an initial explanation of how IS integration relates to M&A.

Well aware of the thin line between frameworks and models, the dimensions and their mutual relations will here be presented as a first, initial version of a systemic model of IS integration in M&A. The reason why this contribution is called a model is that it is based on the identified relations possible to positions constituting components to each other. A framework is here regarded as a set of mutually independent entities that highlight specific aspects of a phenomenon prospectively useful in understanding the phenomenon, i.e., creating a model that explains how the aspects relate to each other. A framework

does not contain information that explains, only the aspects that could be useful in explaining. Therefore, containing an explanation of how IS integration in M&A evolves the combined answer of R1 and R2 is more appropriately labeled model. The model's coverage, limitations and generic characters will be addressed in the last chapter of this thesis when discussing the conclusions possible to extract from the study.

9.3.1 Aspects to consider when explaining IS integration in M&A

When consolidating the preliminary theoretical framework from 6.3, the suggested changes after evaluating the individual dimensions and the need of a seventh dimension take into account improvements and organizational learning processes, evidenced in Table 9.3. It is argued that the present seven dimensions capture the essences and key characteristics of IS integration in M&A.

Table 9.3 Seven dimensions of IS integration in M&A

Dimension	*Description*	*Classification*	*Indicative references*
A. Synergetic potential			
Technical economies	Scale economies that occur when the physical processes inside the firm are altered so that the same amounts of inputs produce a higher quantity of output, or the same quantity of output is produced using fever resources.	Marketing, Production, Experience, Scheduling, Banking, Compensation	(Howell, 1970; Shepherd, 1979)
Pecuniary economies	Correspond to the firm's capability to dictate market prices by making use of market power achieved primarily by size.	Monopoly, Monopsy	(Porter, 1980; Shepherd, 1979)
B. Organizational Integration			
Interdependency type	Organizational units with relations to each other can have three types of mutual dependencies	Pooled, Sequential, Reciprocal	(Thompson, 2003)
Degree of Integration	The aspired level of integration is not always complete absorption, but can rather be of different degrees	Holding, Preservation, Symbiosis, Absorption	(Haspeslagh & Jemison, 1991)
Integrated Activity	Which part of the organization being object for integration is related to the amount of resources needed.	Operational, Functional	(Barki & Pinsonneault, 2005)
C. Intentions & Reactions			
Friendliness/ Hostility	The continuum depicts different levels of "hostility" based on the acquired units state before the M&A and the purpose of the takeover.	Rescue, Collaboration, Combination, Takeover	(Pritchett, 1985)
Reaction	Humans are considered key components of modern organization and an M&A can trigger extensive resistance and employee turnover	Turnover rate, Level of distrust	(Napier, 1989; Buono & Bowditch, 1989)

D. IS Ecology			
Supported activity	A contemporary IS base consists of several heterogeneous systems. A typology based on supportive function is argued appropriate for this framework.	Operational, Functional	(Barki & Pinsonneault, 2005)
Strategic importance		None, Enabling, Utility, Strategic	(Weill & Broadbent, 1998)
E. Integration Architecture			
Integration level	IS can be integrated on several different levels, all with their individual advantages and disadvantages.	IT, Infological, Organizational (business)	(Al Mosawi et al., 2006; Iivari, 2007)
Integration structure	The actual linkage between two or more systems can be organized in several ways.	P2P, Middleware, Enterprise-wide, Meta-level, SOA	(Markus, 2000; Davenport, 2005; Zhu, 2005)
F. IS integration role			
Proactivity	It has been suggested that IS should be a part of pre-M&A due diligence and not, as currently, a post-M&A issue.	Proactive improvement, Proactive matching, Reactive	(McKiernan & Merali, 1995) (Merali & McKiernan, 1993)
L: Improvements and organizational learning			
Double and single loop learning	Single loop means learning to master new technology to do the same task as before but using the technology. The double loop is when the potential of technology is fully used to alter the way work is carried out.	Norms and values, detection and correction of errors, feedback, reflection, goals, plans and rules.	Argyris and Schön, 1974, 1978, 1996 Edmondson and Moingeon; 1999
Exploration and Exploitation	The dualism between using existing knowledge and skills to solve an actual problem that has to be solved, or the search of new knowledge that can improve the already functional situation.	Structure, Search, variation, risk taking, experimentation, play, flexibility, discovery, innovation, refinement, choice, production, efficiency, selection, implementation, execution bounded rationality	March, 1991; Levinthal and March, 1981; Weick and Westly, 1996, Cyert and March, 1963; Simon, 2001; Weick, 1979
Externalization and Internalization	Externalizations mean somehow transferring knowledge from one individual to an external medium, and internalization transfers the opposite way.	Willingness, Autonomy, Fluctuation	Nonaka, 1994; Nonaka and Takeuchi, 1995

9.3.2 An initial systemic model of the dynamics of IS integration and M&A

In total, 23 unique ways in which characteristics of IS integration relate to characteristics of the M&A process have been identified. Seven of the relations are derived from the preliminary theoretical walk-through and empirical validation. The remaining 17 relations have been found as patterns in the empirical material and provide additional insight to the dynamics in the process. Finally, 5 ways in which one IS integration in M&A related to a longitudinal dimension were also found. All relations are displayed in Figure 9.1 and listed in Table 9.4.

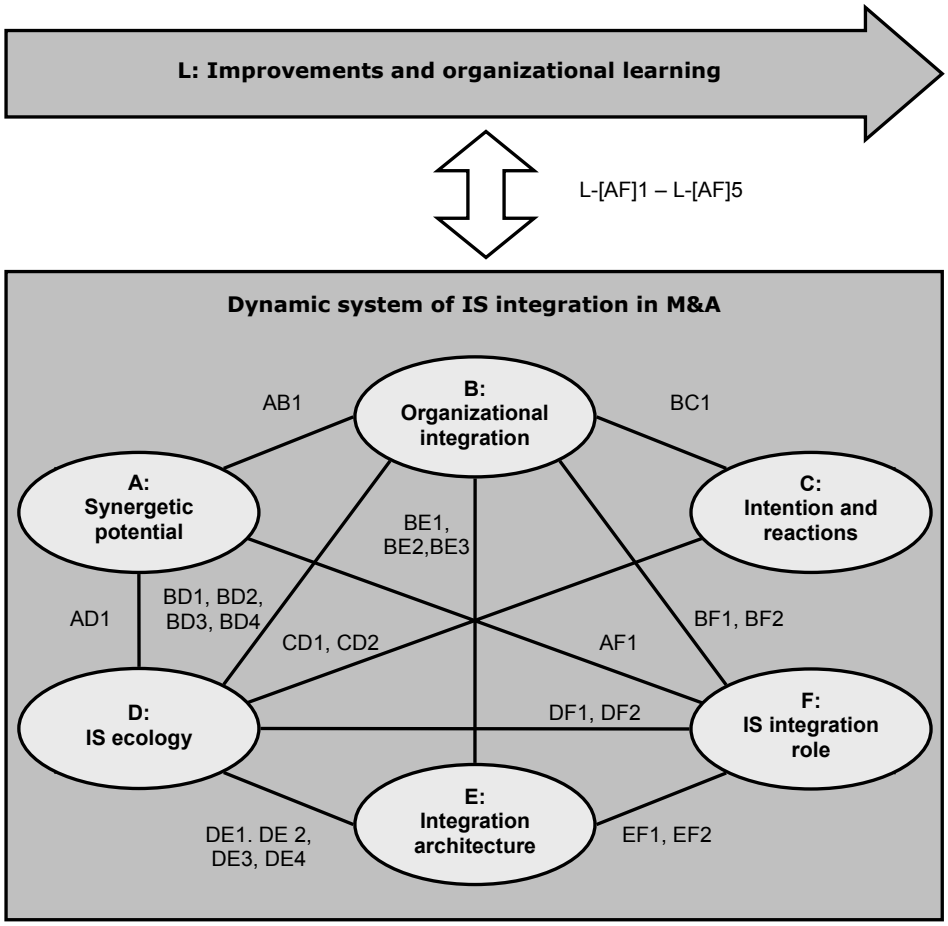


Figure 9.1. Summary of identified relationships. For explanation of each relation, see Table 9.4

Table 9.4 Summary of identified relations in the dynamic system of IS integration in M&A

Relation	*Description*	*Source*
A. Synergetic potential – B. Organizational integration		
AB1	The degree and mode of integration should be dependent on synergies expected as higher levels of integration is resource demanding. In chapter three it was explained how different kinds of synergies were leveraged by different levels of integration. Leveraging monopoly synergies do not demand integration to the same extent as production or scheduling synergies.	(Buono & Bowditch, 1989)
A. Synergetic potential – D. IS ecology		
AD1	Synergies were sought in sales, marketing and production development. But as only Infrastructural IS was implemented, these technological synergies could never be leveraged. This also confirms that IS integration has a significant role in the leverage of some synergetic potential, and the finding specify that to be that integration of Transactional IS is needed to leverage synergies in sales.	Case CRP

Relation	*Description*	*Source*
A. Synergetic potential – F. IS integration role		
AF1	A proactive use of IS integration enables more accurate synergy estimation and possibly identification of supplementary synergies. As IS integration is a risky and cumbersome process, it is an issue that has to be considered early in the process. If not, costs related to IS integration can rapidly overshadow the benefits of the integration. McKiernan and Merali even argue that sometimes relative easiness in IS integration could even be a reason for a M&A.	(Barki & Pinsonneault, 2005; Weill & Broadbent, 1998).
B. Organizational integration – C. Intention and reactions		
BC1	Resistance among employees may cause integration problems which makes a lot of sense. If one strives for higher degrees of integration, it is not a good idea to have the workforce opposing you. What Buono and Bowditch contributed were insights that help understand when and why people are opposing the integration in order to avoid such situations.	(Markus, 2000)
B. Organizational Integration – D. IS ecology		
BD1	Operational integration requires integration of the internal value chain, which requires heavy integration of Transactional IS. Functional integration, in turn, is related to integration of Information IS. The more complex dependency of operational units should make integration in Transaction IS more demanding in terms of resources and time, compared to Informational IS.	(Markus, 2000)
BD2	Stylianou et al. suggested that the IS fit as part of the organizational fit had significant impact on the resources needed for IS integration. Not only did they find that differences in the two companies' IS, for example programming language if internally developed, had a negative impact on resources needed, but they also found that determining these differences and taking action upon the information prior to the M&A did have a positive impact, which further strengthens the evidence that IS fit is significant in M&A.	(Stylianou et al. 1996)
BD3	As the whole approach to the integration changed from absorption to symbiosis this led to a new focus of IS integration. Rather than focusing on Information IS to achieve control, integration in Transaction IS was sought to leverage synergies and increase profits. The symbiosis approach favored other functionality rather than the absorption strategy.	Case Kléber
BD4	When TIH acquired Dynaflex they wanted not to destroy the specific value of Dynaflex and saw little need to integrate business activities. However, they wanted transparency and ability to control the progression of business. The solution was to integrate informational IS. When striving for preservation there is no need for integrating transaction IS.	Case Dynaflex
B. Organizational integration – E. Integration architecture		
BE1	In the case, Trelleborg evaluated the option that required integration with middleware architecture. They found that the available technology, at the time of the late 90's, would not permit the tight integration that they required. Thus, the finding that it was not efficient to undertake higher degrees of integration with middleware architecture.	Case Kléber
BE2	Although Preservation was the chosen approach to organizational integration, TIH still went for Enterprise-wide integration. They did so, not for integration reasons, but for standardization reasons. Implementing the same system was expected to be the most cost effective. The lesson learnt is that integration may come as a by-product, triggered by actions that are driven by other mechanisms.	Case Dynaflex
BE3	At lower levels of integration, drivers other than the architectures enabling properties seem to be decisive, such as cost savings by standardization and knowledge of specific systems.	Case Chase-Walton

Relation	*Description*	*Source*
B. Organizational integration – F. IS integration role		
BF1	When the new unit TIH acquired the hi-tech company, Dynaflex, it took use of its new platform as a proactive use of IS integration. The objective was absorption, and this was possible as the existing systems permitted inclusion of new organizational units, which was one outspoken objective with the new setup. Proactive use of integration enabled smooth absorption.	Case Kléber
BF2	The striving for organizational integration was preservation. Preservation implies leaving the acquired unit mostly undisturbed, in terms of IS integration. As such, IS integration issues play a minor role and can thus be treated reactively.	Case CRP
C. Intention & reactions – IS Ecology		
CD1	Regarding the process in retroperspection, the deals stabilization as collaboration resulted in a different functionality focus. The focus was shifted from Information IS to Transaction IS.	Case Kléber
CD2	In the CRP-case only Infrastructural IS was integrated. The task was mainly of technical nature, and IS integration was not required on an infological or organizational level. Therefore, the integration work was only affected by the M&A context to a very limited extent. The dimension of intention and reaction primarily refers to human reaction which is important when integration is integration is needed in business processes.	Case CRP
D. IS ecology – E. Integration Architecture		
DE1	If integration of Transaction IS, as suggested, is more demanding and requires deeper coupling than Informational IS, then it has consequences for selection of integration architecture. Integrating a whole operational chain with point-to-point architecture should logically be too complex. In this case a single system, not perhaps a complete Enterprise-wide, but at least some sort of "process wide" architecture can be claimed more suitable.	(McKiernan & Merali, 1995)
DE2	If the IS is business critical then integrating with point-to-point or middleware could be preferred in favor of an enterprise wide system. Implementing a new enterprise wide system is a highly risky and complicated process. Integrating existing systems is argued less difficult and risky than a complete transition	(Checkland & Scholes, 1990)
DE3	The view of IS at Dynaflex was that it was not strategic. Therefore, it could be replaced by reason of searching for cost savings. If it would have been regarded as strategic, it would have been risky to replace it.	Case Dynaflex
DE4	If the company strives for higher degree of integration and at the same time regards the IS supporting that activity to be of importance, enterprise-wide integration is the choice. The less important IS becomes for the activity, and the lower the degree of integration that is striven for, the less reason to go for enterprise-wide integration. This relation seems to be decided by architectures' 'enabling' characteristics.	Case Chase-Walton
D. IS Ecology – F. IS integration role		
DF1	By the same reasons as mentioned above, integration in only Infrastructural IS was not severely affected by the general M&A characteristics and was not to a high degree affecting the outcome of the general process. Therefore if integrating only Infrastructural IS, the IS integration can assume a reactive position without endangering the M&A initiative.	Case CRP
DF2	Not all IS in a company is of equal strategic importance, and the degree of proactiveness was, in the Chase-Walton case, directly related to the importance of the IS. For activities where IS had an important function, leaning towards a dependent character, a clear plan was available. In areas where IS had a less important role, integration could assume a	Case Chase-Walton

Relation	*Description*	*Source*
	more reactive process.	
E. Integration architecture – F. IS integration role		
EF1	A reactive approach is likely to transform existing systems rather than replacing them. If IS managers are approached with the issue to fulfill an integration need after the deal is closed, the completion of the plans are often time critical as the pressure is high to recapture invested money.	(Checkland & Scholes, 1990)
EF2	TIH had during the last decade developed a functional Enterprise-wide system that was fairly simple to transform and extend. Unless this system was in place, it would not have been possible to choose the Enterprise-wide integration architecture as the short time frame would not have permitted bulky transformations.	Case Dynaflex
L. Improvements and organizational learning – [AF]. DYSIIM		
L-[AF]1	Decentralization works as an inhibiting factor in that information awareness is limited. The decentralized structure also manifests itself in the problems of assuming double loop learning on a corporate level. Individual units may undergo this second loop but the knowledge in our study was not communicated to the mother organization. Further, the decentralization of the organization and the tightly coupled structures within the integrating organizations did not allow for exploring new knowledge.	Cross case comparison
L-[AF]2	Heterogeneous information architecture makes it harder to draw general conclusions from one M&A to another since the organizational parameters change and pose different requirements on the IS integration.	Cross case comparison
L-[AF]3	Trelleborg did not externalize their knowledge of IS integration in M&A, making it rather specific to certain individuals. IS integration in M&A is a far too complex issue to ever deal with in "cook-book style."	Cross case comparison
L-[AF]4	Understanding and realizing that IS integration challenges and changes the working environment are important. Relating to new norms and values by corporate communications and understanding the new strategy may threaten the members of the organization with an underlying risk of losing valuable tacit and explicit knowledge.	Cross case comparison
L-[AF]5	A fostered reactive rather than proactive approach towards IS, meaning that IS is considered only as necessary support systems, may lead to alternative ways of carrying out integration that are not yet discovered. Understanding the process of IS integration not only requires a supportive organizational context but also recognizes the difficulties that rest within the thought of rationally structuring the IS integration process. Beholding this arduousness opens up exploring new knowledge as well as the possibility of double loop learning.	Cross case comparison

The dimensions and relations are depicted as a dynamic system. "Dynamic" in this case refers to the meaning of an active and changing system. With time, decisions and actions likely alter the properties of each dimension. Presenting it as a system embodies the idea of a set of elements connected together to form one entity, thus showing properties which are properties of the whole, rather than properties of its component parts (c.f. Hanseth, 2000). A system might be defined as a coherent set of interdependent components that exists for some purpose, has some stability, and can be usefully viewed as a whole

(2005a). The interdependent components in this case are the individual dimensions. The purpose is to efficiently support the general M&A objectives, expressed by dimension A. Effects from M&As are long lasting, swells sometimes have impacts even after 10 or 20 years, and as long as these effects prevail, so does the relation between IS integration and M&A. Systems have properties as a whole. The dynamic system of IS integration in M&A has properties as whole, such as resource use, lifetime, and impact on business. It has also, or at least could have, impact on other dynamic systems of IS integration in M&A. For example, which architectural principles are used to realize integration, will have impact on the future integration initiatives in accordance with the path dependency of emerging information infrastructures (2005a). An effort was made to capture these relations from one dynamic system of IS integration in M&A to another through the introduction of a meta-level dimension – Dimension L: Improvements and organizational learning. Thus, the relations between dimension L and the other dimension are to the dynamic system as a whole and not the individual dimensions.

By the use of the model, it is possible to see how changes in one dimension might trigger changes in other areas that, in turn, trigger new changes, that trigger other areas … All cases include elements that clearly state that the matter works as a system where all dimensions are dependent on others. The Kléber case illustrated how a shift in intentions towards more collaboration altered the agenda. In the Dynaflex case the development of the IS integration capability enabled an enterprise-wide solution that actually led to more integration than was needed. For CRP they idea of preservation and only pursuing some of the potential synergies meant that synergies could be leveraged by only integrating infrastructural IS which, in turn, limited the organizational integration possible but decreased the risks of resistance among employees. Finally, in the Chase-Walton case we saw how the clear differentiation of the degree of importance between information flows, as a result of a proactive approach to IS, led to activities and systems being integrated differently.

The DySIIM (Dynamic System of IS integration in M&A) model should be regarded as an initial model that in many aspects requires further research to increase validity. One way to enhance the model and further validate it would be to, through methodology for design science research, restate its explanatory elements to prescriptive suggestions that

could be introduced to practitioners and then be evaluated based on the usefulness in managing IS integration in M&A. Conclusions from this exposure could then be used to further reinforce the existing explanatory elements. The transformation into prescriptive elements and its evaluation will be the topic of the next chapter.

9.4 In the light of recent contributions on IS integration in M&A

While this researcher was studying the four M&As by Trelleborg AB, other researchers continued to report their findings on the relationship between IS integration and M&A. As presented in chapter 4, it was in primarily two areas that major contributions had been made since the start of this project: IS integration success and IS integration alignment.

When it comes to the success notion, Alaranta (2006) defines it as a four dimensional construct of User satisfaction of the integrated software's system and information quality as well as its use, Efficient and effective IS integration management, Efficient IS staff integration, and IS ability to support the underlying motives of the merger. This work has deliberately avoided defining any general view of IS integration success as it should be acknowledged that success is objective to the stakeholder and the perspective of analysis. In some sense the discussion in chapter 2 of IS integration management objectives was a discussion of success. Success was defined as arriving at the integration level needed to support business using as few resources as possible. This view of success takes a fundamentally economic and rational management perspective. Alaranta (Gregor & Jones, 2007, p. 313) does not address her perspective, but the subcategories seems to be an approach to include more stakeholders' views and also an information quality view. In order to be useful here for the conceptualization of success, its validity would have been needed to be discussed in more detail and also matched with the perspective of this thesis. A refinement of the success-notion may in the future contribute to the elaboration of the framework for IS integration in M&A but for now it is left without consequences.

The discussion of IS integration management and objectives unsought leads to the two recent contributions: Wijnhoven et al. (2006) and Mehta and Hirschheim (2007). In both these publications

the objective of IS integration management is set to be alignment between IS integration strategy and business strategy. Regarding strategy on a high level, the contributions primarily focus on another unit of analysis, but do provide some interesting and useful insights also for this thesis. First, they conclude that once made public, the expected synergies almost become obsessions for the companies, as they will be punished by the stock-market if not leveraged. This does not give any new insight on which relations exist between the dimensions, but explains why the synergies did play such an important part in the M&As studied. Even by using the framework, it is suggested that it is not economically motivated to seek some synergies in an M&A, as for example, it would be too costly to replace the ERP systems, but companies may still pursue such integration as they promised the related synergies to the market.

When Wijnhoven et al. (Hirschheim & Klein, 2003; Iivari, 2007) approach IS integration in M&A from an alignment perspective, they do so because "Interpreting merger objectives to proper IT integration strategies is a complex and time-consuming process, due to a lack of explicit understanding of the problems involved" (p. 5). They identify three ambition levels of integration (complete integration, partial integration, and marginal integration) which roughly map to the categories of organizational integration, Dimension B, since they are elaborated upon by Haspeslagh and Jemison (1991) as one of the subconcepts of that dimension. The authors relate these ambitions to the four IS integration methods: renewal, standardization, take-over, and synchronization. These do roughly map to the typology of Dimension E in the framework. Except that this thesis has taken a much broader view, and by trying to integrate several other theories, a major difference also lies in that Wijnhoven et al. search for how IS integration objectives are formed. Their interest is not primarily in the consequences that these objectives, or in other words these choices among the structural options, have for the M&A process.

However, the studies do have some common findings. First, Wijnhoven et al. find that the IS integration objectives have impact on the organizational integration and thus on the outcome of the M&A. Further, they find what they call linear relationship between organizational integration ambitions and IS integration ambitions, which is in line with the findings here. With a different primary focus, Wijnhoven et al.'s study does not require any changes to the

framework, but instead confirms some of the basic ideas behind the study. Not the least of which is their experience of the importance of studying IS integration in the M&A context which is in line with this study. The topic is described as an "urgency" and the number of related scientific studies as surprisingly low, which is pretty much the same conclusion that is made in this thesis.

9.5 Contribution of Chapter 9

Chapter 9 has been concerned with describing and explaining IS integration at Trelleborg AB and, based on the findings, has theorized on IS integration in the context of M&A. First, the methodological considerations for this task were considered, including the role of theoretical and empirical input as well as appropriate techniques for data gathering and analysis. A preliminary theoretical framework was amalgated from existing research on M&A, IS integration and IS integration in M&A. This framework was then used in four case studies of M&As by the Swedish industrial group Trelleborg AB. Describing the cases with the framework made it possible to reveal 23 ways in which IS integration relates to the M&A process. It is not argued that this is a complete account for the relationship between IS integration and M&A, but with the dimensions and the relations, an initial model over the dynamic system of IS integration in M&A (DySIIM) has been created. The model, called dynamic system, underlines that the different elements are dynamically related. That is, changes in one element under certain conditions trigger changes in other elements, and they, in turn, trigger more changes, and so on. It is called a system because the relationship between IS integration and M&A shows systemic properties towards its environment. One way in which it acts as a unified whole is towards the organizational learning processes that could, and should, take place from one M&A to another.

The contribution of Chapter 9 is partly the explanations of how IS integration related to the M&A processes made at four M&As by Trelleborg. The other contribution of Chapter 9 is the DySIIMA model that contains abstract knowledge gained in studying the four cases. This knowledge will be further used in the next chapter which tries to develop practical useful knowledge to support IS professionals faced with the problem of IS integration in M&A.

PART III

Supporting management of IS integration in M&A

10. A design for this design science

Moving from the descriptive and explanatory elements of this dissertation towards the second purpose of this thesis, is a move into the domain of design science. This chapter first presents the methodological considerations related to this prolongation of the findings and conclusions made thus far. Thereafter, the prescriptive elements and their foundation in theoretically grounded knowledge are introduced; finally the chapter ends with a description of the results of tests aimed at evaluating the prescriptive elements.

10.1 Towards prescriptive theory

"It is difficult to over-emphasize the significance of design work and design knowledge in Information Systems (IS) for both research and practice" (Gregor & Jones, 2007, p. 313). Recently, the so called IS design research has become increasingly popular, promoted as a means to address the relevance and utilization problem of IS research (Hirschheim & Klein, 2003; Iivari, 2007). Traditional IS research is based on natural and behavioristic sciences, searching to describe and explain encountered phenomena. The objective of design research, is "to develop valid knowledge that can be used by professionals in the field in question to design solutions to their field problems" (van Aken, 2005a, p. 22). It may be questioned whether this output should be referred to as theory or not, but the significance of design knowledge for the IS field is well established (Gregor & Jones, 2007). In a restricted use of the word theory, design knowledge may be excluded from the referred to objects (Gregor & Jones, 2007). In other interpretations, design knowledge may be categorized as prescriptive theory (Gregor, 2006). Prescriptive theory concerns *how to do something* (Gregor, 2006). In this case, 'something' is management of IS integration in M&A, and the desired outcome of design research is practical knowledge that can be used in this managerial process. It can be recaptured from chapter 1 that managing IS integration in M&A

means understanding how IS integration relates to the M&A context and acts upon the environmental pressure on the integration solution.

The ambition of the first phase to create descriptive and explanatory theory was not something that needed justification for being relevant for research since it has a well established position within IS research, and one that most researcher would agree upon. Similarly, the use of the qualitative method in general, and the case study approach in particular also have established positions within the IS research community. Therefore, the methods as such need not to be argued, only their appropriateness for the specific research presented here. Although IS design research, or design science - the terms are used interchangeably in IS research (Venable, 2006) - has recently gained increased attention and has achieved an accepted, yet minor, position in IS community, the field is still in its childhood. One consequence of the immaturity is a sometimes fuzzy and ambiguous vocabulary. Several streams of thought do exist within IS design science that are not always compatible with each other. Within IS design research, two major orientations have emerged: IS design research (Cao et al., 2006; Hevner et al., 2004; March & Smith, 1995) and IS design theory (Walls et al., 1992, 2004). Both orientations have a focus on design of IT artifacts *per se* while leaving out people and organizations from the potential design contribution (Carlsson, 2006; McKay & Marshall, 2005). It is thus the role of IS design research within IS research that has to be argued, but it is also not entirely uncontroversial to regard knowledge for IS management as a desirable outcome of IS design science within the design science community. Therefore, it has to be defined what is meant with design science, what should be the desired outcome in this study, and why this kind of knowledge is a valuable contribution.

Another issue when doing IS design science in IS management is that the creation of a research method is more problematic in the second phase than it was in the first. When conducting traditional IS research based on a natural scientific or behavioral research paradigm, a substantial basis of methodological support is available to assist the researcher in developing a process that leads to descriptive and explorative outcomes (e.g. Eisenhardt & Graebner, 2007; Miles & Huberman, 1994; Van de Ven, 1992; Yin, 1994). For IS design science there are no elaborated guidelines that exist (Venable, 2006), although research with the ambition to develop IT artifacts has more recently received a few contributions that present frameworks for addressing this

kind of IS design science (Hevner et al., 2004; March & Smith, 1995; Walls et al., 2004; Venable, 2006). For design research with the ambition to improve IS use and management, methodological support is sparse. Thus far the writings on IS design science have foremost emphasized its potential of increasing relevance in IS research. Yet, as scientific research, the condition of rigor cannot be ignored. Therefore, the methodological section of this chapter needs to be of defining and explaining character to clearly point out the consequences and need of applied research activities to an extent that was not required in the first phase of more mainstream IS research.

10.1.1 Objectives of IS design science

Scientific research can be classified and categorized in many different ways. One way is suggested by Herbert Simon (1996). His book, "The science of the artificial," is given the distinction as being between natural sciences and artificial sciences. Natural sciences focus on how natural and social things are, while artificial or design sciences focus on how to design artifacts to fulfill certain requirements. Inspired by practically oriented sciences such as Engineering and Medicine, IS design research focuses on the IT artifact as output of science (Carlsson, 2006). The focus of IS design research is debated. One interpretation is that IS design research should develop physical instantiations of IT, i.e., applications, programs, algorithms, and devices (Walls et al., 1992; Hevner et al., 2004; Venable, 2006). A second interpretation is that artifact refers to, as discussed by Simon in 1969 (and in the reprint of 1996), not just the physical IT artifact (c.f. Hevner et al., 2004; March & Smith, 1995; Walls et al., 2004), but also includes IS use and management. Dalhbom's (1996) view of artifacts exemplifies this second perspective: "People and their lives are themselves artifacts, constructed, and their major material in that construction is technology. […] When we say we study artifacts, it is not computers or computer systems we mean, but information technology use." (p. 43) This discourse is analogous with the debate on what is the definition of IS and what should be the topic of IS research, as presented in chapter 2. To somewhat restrict confusion between different interpretations of the word artifact and emphasize what should be the output of IS design research, a few authors partly avoid the terminology confusion by stressing that design research may also include practical knowledge for

the design and improvement of IS use and management (Carlsson, 2006; Hrastinski et al., 2007) As explained by Iivari (2007, p. 14), "One should note, however, that not all artifacts developed in design science research within Computer Science, Information Systems and Software Engineering are information or software systems (e.g., systems development methods)" As discussed already in Chapter 1, the objective of this thesis is not in any sense to produce IT artifacts that somehow can be used in IS integration. The domain is management of IS integration in M&A, thus any contribution should be towards the improvement of this managerial task.

"Relevance, rigor and results are the trifecta of academic research" (March 2006, p. 338). IS design science is advocated as a way to increase relevance of IS research. Relevance is subjective. IS research may be relevant to a number of acceptable stakeholders, including other researchers, research and development organizations, consultants, IS students, and even to society in general (Carlsson, 2006). The target group for design science research on IS includes

> IS academic researchers, organizations that develop and deploy information technologies (IT), organizations that produce and implement such technologies, IS managers within such organizations and, more and more commonly, general and upper level managers within such organizations (March 2006, p. 339).

M&A's are generally driven by top level management, and corresponding IS integration is by nature of the initiative, the responsibility of high level IS managers (Alaranta & Henningsson, 2007). The target group of this research is thus primarily IS professional with positions that give the responsibility and authority to affect how IS is addressed in the M&A context. An IS professional can be defined as a member of a fairly well-defined group who solves real-world IS problems with the help of skills, creativity and scientific and non-scientific IS design knowledge. From their perspective, the contribution can be seen as theoretically grounded management knowledge. Several authors have recently put forward the role of evidence-based management knowledge to assist managers in making more informed and better decisions (e.g. Bennis & O'Toole 2005, Pawson 2006; Pfeffer & Sutton 2006). Evidence-based knowledge on management of IS integration in M&A is to be used by IS professionals that can be expected to have experience of IS management, corporate

information infrastructures and education in the IS field (Hrastinski et al., 2007; Romme, 2003; van Aken, 2005a). Relevant knowledge is, hence, not cookbook-like recipes on how to compose accurate IS integration, something which also would have been practically unfeasible with respect to the complexity and contextually dependent nature of IS integration in M&A, but rather knowledge that on a case basis can be interpreted and applied to a specific situation.

Using van Aken's (2004) classification, three different types of designs an IS professional makes when designing and implementing an IS-initiative can be distinguished 1) an object-design, 2) a realization-design, and 3) a process-design. An object design is the design of the IS intervention (initiative). A realization design is the plan for the implementation of the IS intervention/initiative (incl. design of an IT-artifact). Finally, is the professional's own plan for the problem solving cycle, including the methods, techniques, and design theories to be used in object- and realization-design. With an IS initiative is meant the design and implementation of an intervention in a social-technical system where IS (including IT artifacts) are critical means for achieving the desired outcomes of the intervention. IS design science research should produce abstract knowledge that can be used by the professionals in the three types of designs. It can be argued, based on the IS implementation and IS failure literature, that realization-design knowledge, of which a typical example is design theory for IS use and management, is critical for successful use of IS. Realization-design knowledge is abstract knowledge of IS use and management.

Supporting the management of IS integration in M&A requires a profound understanding of the managerial task and clear view of who is going to make use of the prescriptive elements. With the four case studies presented in Chapter 7, there is a basis to approach the managerial process and its need. The three-phase model of Haspelslagh and Jemisson (Figure 10.1) introduced in Chapter 1 as a means to discuss IS-related issue in the M&A-process, can be argued too simplistic, but with the case studies in mind, it conceptually fits well with the managerial issues that are met during the course. The proactive-reactive contrast, which essentially is an IS management perspective on the task of IS integration, includes as explained in Chapter 4 an IS integration capability improvement activity, a matching phase and eventually a reactive implementation phase. It is in this context that any supporting knowledge should be introduced.

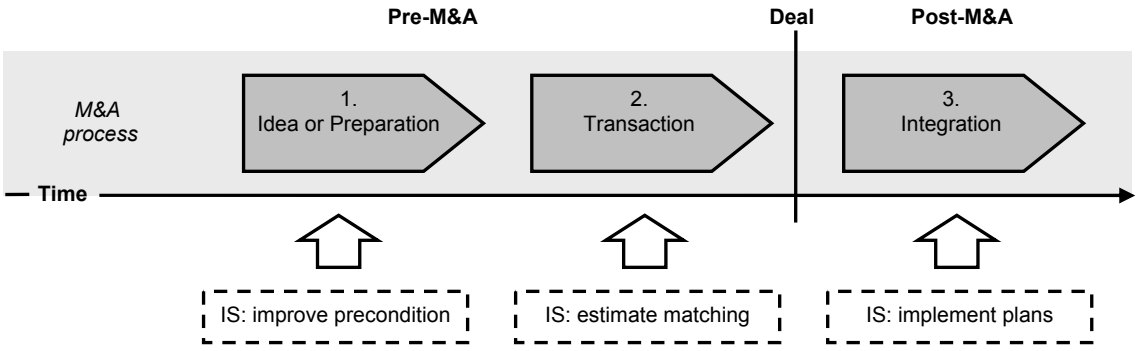


Figure 10.1 The M&A integration process according to Haspeslagh and Jemison (1991) and critical IS-related tasks during the process.

In this thesis is used the the term 'design proposition' (Bunge, 1967) as the desired outcome of design science. Design propositions is a term used in management research (Hrastinski et al., 2007) that follows the logic of a technological rule: "In situation S, to achieve consequence C, do A" (Hrastinski et al., 2007). In the field of IS it may be better to use design proposition instead of technological rule since the latter term may suggest a technical, rather mechanistic approach (1997). It should also be noticed that the type of design proposition used in this text is heuristic rather than algorithmic. The use of an algorithmic design proposition means that the introduction of A automatic leads to consequence C. The use of a heuristic design proposition does not in the same manner automatically lead to consequence C, but supports its completion. A design proposition follows the same structure as a technological rule, but the "A" can be presented as a drawing, picture, a report or a whole book (Hrastinski et al., 2007).

Hrastinski et al. (2007) adapted a model originally developed by Pawson and Tilley (1997) (Figure 10.2) for realist causal explanations that show the role of design science. The model shows certain mechanisms leading to specific outcomes. It could be the process of choosing whether or not to include the possibility for synchronous learning in an e-learning course (Hrastinski et al., 2007) or how to leverage benefits from knowledge management systems (Carlsson & Kalling, 2007). Thus, it is possible to take contextual variables into account, but it is not possible to give guidance for every specific context. Instead, practitioners are suggested to design based on

experience, the specific problem situation and context, and on the knowledge of the design propositions (Carlsson, 2006; van Aken, 2006).

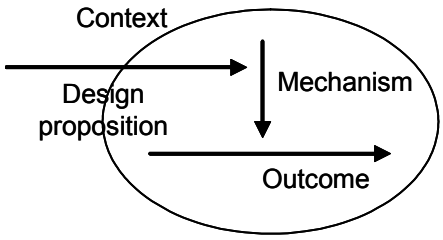


Figure 10.2 Guiding "beneficial" outcomes Hrastinski et al. (2007) (adapted from Pawson & Tilley, 1997).

The arrow labeled "Design proposition" was added by Hrastinski et al. "to emphasize that the likelihood that mechanisms leading to 'beneficial' outcomes can be increased if practitioners are given guidance based on what is currently known'". Using the terminology of Hrastinski et al., this second phase of the research aspires to create design propositions on management of IS integration in M&A. This author also follows the advice of Hrastinski et al. (2007) and van Aken (2005) that when suggesting a design proposition it is important to provide "thick descriptions" to aid the reader in understanding the theory, which may support practitioners in translating them to specific contexts and situations.

10.1.2 Design propositions as reflections of the understanding

In the discussion on the purpose of the study presented in this thesis, it was argued that design propositions for management of IS integration in M&A would be a way to express and reinforce the understanding that can be achieved by studies based on the theoretical framework. The study's dual imperatives may at a first glance appear to be distinct objectives, but the theoretical core and the design propositions can also be seen as inseparable. As explained above, IS research that seeks to develop and justify theories (i.e., principles and laws) that explain organizational phenomena surrounding IS form a behavioral-science paradigm. It can be contrasted to a design-science paradigm that seeks to solve practical problems (Hevner et al., 2004; Markus et al., 2002;

Mathiassen, 2002; Gregor & Jones, 2007; Iivari, 2007; Venable, 2006; Carlsson, 2006). However, practical knowledge is not exempt from behavioral theories, but rather relies on existing kernel theories. As Iivari confirms, "The existence of a kernel theory to be a defining characteristic of a 'design theory'" (Iivari, 2007p. 12). The relations between different types of theory, according to Gregor (2006).(2008), are depicted in Figure 10.3. Theories for describing, explaining, predicting and taking action are tightly interrelated: "Knowledge of people and information technology capabilities informs the design and development of new information systems artefacts" (p. 629).

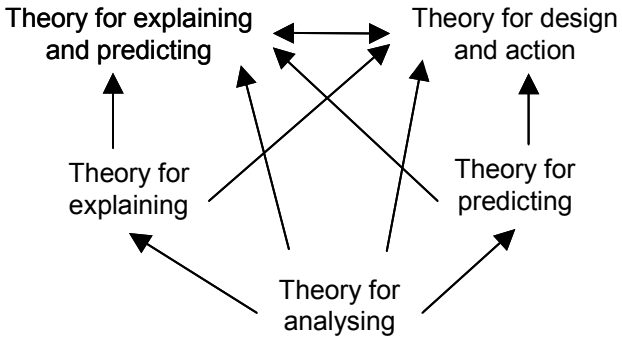


Figure 10.3. Interrelationships among theory types (Gregor 2006)

However, the potential of theory enhancement is also reversible. The development of supporting knowledge is an effective way of generating more insights on the principles and laws behind the problem (Simon, 1996). According to Rosemann and Vessey (2008), design theory that builds upon explanatory and descriptive theory can be a way of conducting applicability checks of the research. Applicability checks are needed to ensure that the developed explanatory and descriptive theories are important, accessible, and suitable. It has been noticed that much of the IS research produced does not meet these criteria (Rosemann & Vessey, 2008). The conclusion is that descriptive and explanatory theory development, and the development of design theories on IS use and management, go hand in hand and are reflections of the same understanding.

10.2 Design activities

As mentioned above, when conducting traditional IS research, based on the behaviorist research paradigm, a substantial basis of methodological support is available to assist the researcher in developing explanatory and descriptive theory (e.g. Dubé & Paré, 2003; Eisenhardt & Graebner, 2007; Mays & Pope, 1995; Mohr, 1982; Van de Ven, 1992; Yin, 1994). In addition, the important IS design science frameworks that address methodological questions have primary, or exclusive, focus on the development of physical IT artifacts (c.f. Hevner et al., 2004; March & Smith, 1995; Walls et al., 1992; Venable, 2006). Gregor and Jones (2007) present a description on the elements of a design theory that scopes also theory for IS use and management. This is a valuable support for the design researcher, as the desired outcome of the process can be specified. However, for design research with the ambition to improve IS use and management, the methodological support, guiding the researcher in getting to the desired outcome, is limited. A few works that partly touch upon the methodological issues of design science research on IS use and management do exist (Hrastinski et al., 2007; Baskerville et al., 2007; Carlsson, 2006). Suggestions from these contributions have been used to design the research process in the design phase of this study. In addition, just as much traditional IS research has been inspired by methodology for organizational research (c.f. case based research - (Eisenhardt & Graebner, 2007; Yin, 1994)), management design research (e.g. Bunge, 1967; Romme, 2003; van Aken, 2005a; van Aken, 2005b) may also inspire design research with focus of IS use and management. The combined set of suggestions was used as foundation for deciding upon the research activities below.

The starting-point for design research is the identification of a practical problem that needs to be solved (Carlsson, 2006; Hrastinski et al., 2007). Already in chapter 1 it was argued that there was a significant gap in the existing research that caused problems for IS professionals. The need for support was further elaborated above in section 10.1.1 and used as a starting point for the development of design propositions on management of IS integration in M&A. The development process of design propositions has, to large extent, conformed to the IS design research cycle (Figure 10.4), as suggested by Carlsson (2006). The author suggests that IS design research is an iterative process between a) identification of theory and/or problem, b)

development of prescriptive guidelines, c) testing, and d) reflection on the test results.

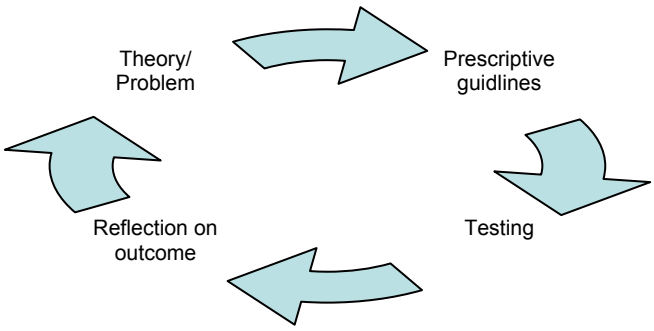


Figure 10.4 The IS Design Research Cycle (Redrawn from Carlsson (2006))

10.2.1 Problem definition

The iterative design process starts with the identification of a perceived practical problem and theory potentially useful for approaching the problem. In this study, the perceived problem was the problem of IS professionals that had to deal with the task of IS integration in M&A. The interaction between practitioner and researcher during the four case studies served as a fairly extensive sensitizing phase which should have produced a profound understanding of the managerial situation and its challenges. The case stories take a managerial perspective and reveal IS-related issues that have to be considered during the M&A process. Some of the consideration was of more technical character, such as which protocols and standards to use, others of more strategic or policy character. The evaluation of the framework at the end of Chapter 9 addresses the usefulness of the framework dimensions in describing the M&A process. As a prolongation of this thesis, this researcher has chosen to go forward with three challenges that in discussion with IS professionals have been identified as problematic and for which there is support in the knowledge generated in this thesis. All three challenges are versions of the task of relating IS to business. Gartner's survey of the CIO's agenda for 2006 showed that the IS function of today's companies are expected not only to have their technical solutions in place, but also contribute to business objectives. The annual Gartner survey of more than 1400 CIOs worldwide depicts that issues concerning security, technologies, and reliability are down tuned in favor of business enhancement. Similarly, MIS Quarterly

Executive reports that in both 2004 and 2005 the top management concern for IS was "IT and business alignment" (Luftman et al., 2006). It is expected that the importance of the task will prevail for at least some time. IS managers express that for 2010 they expect that the role of IS will not only include mobilizing business strategies, but also collaborate in formulating the strategy and move towards flexible information infrastructures that enable new business (March & Smith, 1995). The three challenges, more profoundly described and motivated later, were:

I. As M&As have established themselves as corporate tools that are likely to influence contemporary business for a long time, organizations that are using M&A as a part of their growth strategy have to learn something from their efforts. This is the first challenge approached (See 11.1).
II. One of the main questions that always recur when discussing IS integration with IS and business professionals is the importance of IS for the M&A process. By using the research findings from Chapter 9, a few general principles can be added to this debate (See 11.2).
III. Whether appropriate or not, all cases show processes where strategic decision of synergetic potential is decisive for the closure of the deal, and IS professionals are faced with the task of making appropriate IS integration. It would be fairly uncontroversial to say that this is the normal situation in M&As and that it is likely to remain the condition for some time. A highly relevant question to ask is thus how to integrate, given a specific synergetic objective. The last challenge is addressed by the development of a model specifically focusing on the integration architecture (See 11.3).

10.2.2 Developing prescriptive guidelines

The second phase of the IS design research cycle is the creation of prescriptive guidelines which is followed by a testing-phase in which the tentative guidelines are evaluated. As said before, in this study the prescriptive guidelines were developed in the form of design propositions. The propositions were created by comparing the

problems at hand and the available theoretical understanding. The three managerial challenges all map against different parts of the DySIIM-model included at the end of Chapter 9. The model strives to be neutral when it comes to desired outcomes, and only depicts the relationships from an economic perspective. By introducing the objectives related to each managerial challenge to the model, some parameters can be fixed, and by using the model influencing variables that lead to desirable outcome are identified. This gave a foundation for creating design propositions in the form of "in situation A (the managerial challenge) to achieve B (the objective of the challenge) do something like C (influencing variables according to the DySIIM model)." As recommended, the propositions were formulated with "thick descriptions" that could help the reader interpret propositions in a real world context.

10.2.3 Testing prescription

The lack of methodological support for IS design research for IS use and management is clear when it comes to the third research activity of Carlsson's design research cycle. Design science, with the ambition of developing IT artifacts (c.f. Hevner et al., 2004; Walls et al., 2004), may rely on techniques and methods for product development, including the well established techniques for prototyping in the field of human-computer interaction. For IS design research on IS use and management, we can identify three ways of doing evaluation of the design propositions. We can call these alpha, beta, and gamma-testing. Alpha testing means testing and refinement by the creator(s) of the design theory. Beta testing concerns further development by other researchers. Gamma testing concerns testing the design theory in practice, and includes testing whether practitioners can use it and if the use of the theory leads to the desired outcome(s).

First tentative suggestions were created, based on the initial empirical findings and tested retrospectively on the case-studies at hand in what can be called an alpha-test. Tests were made with the use of empirical data collected to address the study's first purpose evaluations according to a "what if the design propositions had been used"-scenario. Summaries of the results can be found in sections 6.2 to 6.4. Modifications were made to the propositions as new issues and relations were identified in the case studies. By reviewing the M&A process, the

effectiveness of the design propositions to support management in the specific cases were identified. This would be the fourth phase of the cycle. As a cycle, the process then restarts with modification of problem, theory and later prescriptive guidelines.

After exposing the principles to existing case data and adjusting the received input accordingly, a more profound evaluation of the prescriptive elements were undertaken by exposing the design proposition to fellow IS researchers with experience of research on corporate M&As (beta-test) and to the IS professionals that were the intended users (gamma-test). Gamma testing implies real use of the design proposition in the setting it was intended for, by the people for whom the design proposition is developed (Carlsson, 2008). This type of testing would be extremely difficult to undertake for design propositions on management of IS integration in M&A. First, M&A initiatives are at the very core of a company's business strategy, sometimes even challenging the existence of the company. In that setting, intervention with untested design proposition is logically problematic. Second, the effects of an M&A may prevail for up to 20 years, meaning that in order to capture the complete impact of a design proposition would imply a 20 year study. Third, an M&A and related integration work is tightly intertwined with several other processes going on in the companies. It would thus be extremely difficult to isolate effects from the design proposition from all other actions taken during a 20 year timeframe. Thus, pure gamma-testing was not an option for evaluating the design proposition. Instead, the cumulative experience from professionals that had been concerned with IS integration in M&A was used. The professionals were introduced to the created design propositions and interviewed on their potential to support them in their work. Based on their input, the proposals were continuously refined and improved. Carlsson (2006) describes this as the design proposition moving towards saturation. Saturation, which is also used to describe the development of descriptive and explanatory theory, means that the proposition has reached a state where further testing and input only lead to marginal adjustments. Gregor & Jones state that complete saturation may be difficult to achieve and that design research most often searches for "satisfactory design rather than an optimum design" (Gregor & Jones, 2007, p. 317).

For the gamma test, two types of test persons were sought (see Appendix H for a complete list of evaluators). One group consisted of

well experienced senior IS professionals with substantial experience from IS integration in practice. This group, called the "group of senior IS professionals," was thought to be able to provide input foremost on the accuracy of propositions. A second group of gamma-evaluators consisted of younger and less experienced IS professionals. This researcher felt that the typical user of the propositions would be someone not having 30 years of experience of IS integration in M&A, but someone that not to the same extent could rely on personal experience when faced with the problem. This group, called "group of junior IS professionals" could contribute with an evaluation foremost focusing on helpfulness and clearness of the propositions.

The testing was influenced by Rosemann and Vessey's (2008) method for applicability checks within IS design science. They suggest that testing theory should include 7 activities starting with the plannification of the applicability check and ending with analyzing the collected data (Table 10.1).

Table 10.1 Applicability check method by Rosemann and Vessey (2008)

Step	*Activity*	*Description*
1.	Planning the applicability check	The research object under consideration, objectives of the applicability check, and information needed are clearly specified. Further, the research question clearly identifies the research objective, target population, and specific issues to be addressed.
2.	Selecting the applicability check moderator	The person conducting the check has in-depth knowledge of the research under investigation, as well as having significant social skills.
3.	Ensuring familiarity with the research under investigation	Participants in the check are provided with materials that introduce the research, the research object under investigation, and the implications of the object from the viewpoint of practice. Prior to the check proper, the person conducting the check ensures that each participant is sufficiently well informed to take part in the projected evaluation.
4.	Designing the applicability check interview guide	The applicability check method adheres to well established design criteria. The format of the pretested questions for the study, the sequence of their presentation, and an agenda that can fit into the time allotted are specified.
5.	Establishing the applicability check environment	The person conducting the check creates an environment for running the check that is conducive to a fruitful interaction.
6.	Conducting the applicability check	The person conducting the check presents the agenda, and the ground rules for conducting the check then ensures that the check is conducted in a professional manner resulting in unbiased input from all participants.
7.	Analyzing the applicability check data	Procedures for analyzing qualitative data are used to analyze the data derived from the check. Multiple sources of evidence are used, data is coded, and a trail of evidence is provided from the raw data to the final outcomes.

Rosemann and Vessey consider the use of focus groups to be the optimal test environment since analysis based on individuals is too time consuming. However, the use of focus groups requires gathering all involved persons in one place at the same time. In reality, gathering a dozen of high level IS managers turned out not to be feasible. The Focus group method also has a shortcoming in that it doesn't permit tests of variations to the presented design theory,, as all testing takes place at one occasion. It thus requires fairly stable and pre-tested propositions. In sequential testing, adjustments can be made from one test to another to check appropriateness of variation. for this reason, a sequential test method with individuals as unit of analysis was chosen. For the seven step method by Rosemann and Vessey, this affects primarily steps 6 and 7 as the conduction itself is different and the unit of analysis the individual. Other steps were also affected by pragmatic circumstances. For example, Rosemann and Vessey argue that the moderator should be a member of the research team, which consisted of this researcher, to ensure full understanding of the research discussed. They also argue that the moderator should posses "significant social skills" – the social skills of the moderator this researcher chose not to assess.

Regarding the other steps, planning included formalization of test objectives, and criteria for evaluation. A complete listing of IS professionals involved in the testing is found in Appendix H. The persons selected for the test (step 2), were chosen based on their comprehensive experience of IS integration in general and IS integration in M&A, in particular. Test persons were introduced to the activity (step 3) via phone and received the design propositions along with an explanatory letter by mail. Regarding the design materials for the check (step 4), as said before, the support was presented as design propositions. The exact forms for each of the propositions are presented in sections 11.1 - 11.3. A few days after the after the evaluators received the propositions an interview was made at the evaluator's office or by phone (step 5) that included three phases (step 6) (see evaluation guide in Appendix F. In the first phase the interviewees were asked the general use of the propositions, based on their experience. Second, they had to address one specific case in which they had experience and answer the question to "what if," that is, if the design propositions would have been available – what difference would that have made? Third, the test persons were confronted with an imaginary case and the

question whether they could be informed by the design propositions to make decisions that they probably would not have made otherwise. The propositions were evaluated based on the three criteria as suggested by Rosemann and Vessey (2008), elaborated upon criteria developed by Klein et al. (2006):

1. **Importance** - meets the needs of practice by addressing a realworld problem in a timely manner, and in such a way that it can act as the starting point for providing an eventual solution
2. **Accessibility** - whether the research is understandable, readable, and focuses on results rather than the research process
3. **Suitability** – whether it is suitable for meeting the needs of practice: complete, provides guidance and/or direction, and provides concrete recommendations

Using the three conditions means evaluating "the degree to which practitioners can readily comprehend research as promising a solution potentially applicable to a problem existing in their organization" (Rosemann & Vessey, 2008, p. 3), which goes in line with the purpose of the second phase of this study. The condition used for evaluating the framework would not be purposeful at this stage since the intentional use of the evaluated object is different. In the first phase it was the explanatory potential that was in focus for usefulness, in this phase the actionable characteristics. Klein et al. (2006) suggests the use of "applicability" rather than "suitability," but this researcher agrees with Rosemann and Vessey (2008) who contends that applicability is what we are trying to measure and that suitability consists one of the constructs deciding the applicability.

As mentioned earlier, the final design propositions should be seen as expressions and reflections of the understanding provided in the study. Their testing is limited to simulated use and it must be held probable that an extensive use in real situation would reveal additional shortcomings.

10.3 Contribution of Chapter 10

IS design science has been put forward as an alternative for developing practically useful knowledge that can be used by IS professionals facing real world problems. In this chapter, it has been explained how IS

design science can be used to make a contribution towards the second purpose of this thesis, to *support management of IS integration in M&A*. When describing the use of case study and qualitative data in Chapter 5, the approaches as such did not have to be explained or motivated, only the use and usefulness in this particular study. For this phase of the research, more effort had to be made to motivate why IS design science, and especially IS designs science with the objective to enhance IS use and management (rather than developing physical IT artifacts) was a valid research approach and how it was supposed to develop theoretical knowledge.

Chapter 10 has presented the research activities that were carried out in order to develop practical useful knowledge for IS professionals facing IS integration in M&A. The next chapter will give an account of this contribution, which problems were addressed, theoretical fundamentals for design propositions, and not at least the propositions made to support management of IS integration in M&A.

11. Three managerial challenges and their support

Chapter 11 takes the three managerial challenges of IS integration in M&A (identified in the last chapter) as its starting point. All three challenges are discussed according to the phases of the IS design science research cycle: problem definition, identification of kernel theory, development of prescription, testing and reflection that leads to a modification.

11.1 Challenge I: Improving the IS integration capability

As mentioned above, three specific management challenges were selected for further exploration. The first challenge is related to the development of contemporary companies' growth strategy to the state that the act of M&A is no longer of coming and going art.

11.1.1 Problem: Improving from one integration to another

M&A-related integration and disintegration has become a part of the everyday operations for companies with M&As as a part of their growth strategy. However, despite the popularity, surveys continue to report high failure rates when it comes to creating additional economic value (Accenture, 2006; KPMG, 2001); further, it has been noted that, although possible, it is complex and intricate to actually improve performance from M&A to M&A (Haleblian & Finkelstein, 1999). It is here argued that if, exactly as numerous contemporary business organizations currently do, one assumes an M&A-based growth strategy, it is essential that each M&A is accompanied with organizational learning processes that enable performance enhancements in future M&As. The managerial challenge thus is how

to improve from one M&A to the next. The question to pose is whether it is possible to improve the IS related issues, and if so, what can be improved?

The importance of this challenge lies in the fact that organizations must move away from being largely reactive to becoming active participants in shaping their future (Gregor & Jones, 2007). According to a survey of more than 1,400 CIO's worldwide made by Gartner (2006), "executives now expect IT to play a significant role in business growth and competitiveness, a shift that will accelerate in 2006. […] Growth is on the CIO agenda as IT budgets at companies planning to grow faster than the market are increasing by an average of 4.8 percent." Among the CIOs the building of skills to better meet the demands of the organizational strategy was one of the top ten challenges for both 2006 and 2007 (Gartner, 2006; Gartner, 2007). IT management is moving from an anticipatory towards an architectural focus. This means that instead of trying to anticipate the future business strategy which has proven close to impossible, management focuses on creating the appropriate enterprise processes and information frameworks that enable flexibility (Smith & McKeen, 2006). Both the focus on skill development and architectural focus, instead of being anticipatory, are other ways to stress an increased focus on IS capability. In combination with the still problematic M&As, a highly important question to pose is how the IS integration capability could be improved from one M&A to another.

11.1.2 Kernel theory: Organizational learning and IS integration

In Chapter 9 (section 9.2) an additional framework-dimension based on theories of organizational learning was introduced. In section 9.2.2, the theories were applied to four existing cases and revealed how organizational learning processes related to IS integration in M&A are hampered or enabled by organizational factors. The understanding of hampering and enabling factors is here used as kernel theory to make design propositions on the management of an IS integration capability. As repetition, the conclusions were:

L-[AF]1: Decentralization works as an inhibiting factor in that information awareness is limited. The decentralized

structure also manifests itself in the problems of assuming double loop learning on a corporate level. Individual units may undergo this second loop but the knowledge in our study was not communicated to the mother organization. Further, the decentralization of the organization and the tightly coupled structures within the integrating organizations did not allow for exploring new knowledge. Rather, they unintentionally fostered exploitive learning, being less willing to change. This, again, could not be solved only by means of restructuring, but rather through emphasizing information awareness characterized by autonomy and willingness.

L-[AF]2: Heterogeneous information architecture makes it harder to draw general conclusions from one M&A to another since the organizational parameters change and pose different requirements on the IS integration. In the case of Dynaflex the integration project was similar to several previously made integrations, and the management could therefore use its understanding of the systems and processes.

L-[AF]3: Trelleborg do not externalize their knowledge of IS integration in M&A, making it rather specific to certain individuals. Whether this is because of the nature of the knowledge involved in the process or because no initiatives have been perused is not covered by the study data. However, it is apparent that IS integration in M&A is a far too complex issue to ever deal with in "cook-book style," but this is not to say that IS professionals could not be supported by various tools in their work.

L-[AF]4: There is a need to relate to new norms and values, that is, understanding and realizing that IS integration challenges and changes the working environment. Relating to new norms and values by corporate communications and understanding the new strategy may threaten the members of the organization with an underlying risk of losing valuable tacit and explicit knowledge.

L-[AF]5: Exploring new knowledge involves a fostered reactive rather than proactive approach towards IS. This means that considering IS only as necessary support systems may lead to alternative ways of carrying out integration not being discovered. Understanding the process of IS integration requires not only a supportive organizational context, but also a recognition of the difficulties that rest within the framework of rationally structuring the IS integration process. Beholding this arduousness opens up for exploring new knowledge, as well as the possibility of double loop learning.

Noteworthy is that the above-mentioned general conclusions are limited to organizational characteristic of Trelleborg. For example, the consequences of decentralization are naturally limited to decentralized organizations. The decentralized and heterogeneous structure makes a significant footprint in the learning processes. The lessons to learn are logically and foremost applicable to Trelleborg. The summarized points above can be compared to the mechanisms described in Figure 10.2, with "beneficial outcome" in this case referring to fewer resources needed for IS integration. Figure 10.2 also depicts "design propositions" that are applied on the mechanism in order to achieve that beneficial outcome. These design propositions are presented as general principles below. The term "principle" is used since for organizations other than Trelleborg, the relevance of the mechanism should be examined. For example, a centralized organization (in contrast decentralized) may not have to consider mechanisms that are founded on the decentralized condition.

11.1.3 Prescription: Propositions for improving the IS integration capability over time

By combing the concepts of organizational learning and the explanation on the relationship between IS integration and M&A at Trelleborg, we have encountered a few concepts which may help us better integrate the learning from IS integration processes. In order to communicate them to the professional IS community the findings were summarized and explained in a document labeled "Propositions for improving the IS integration over time" (Appendix E). The six propositions are what

earlier was described as design proposition, the omitting of 'design' in the document presented to the IS professionals is a way of increasing the accessibility since design proposition is a term that one might expect most IS professionals have never heard of. The four (design) propositions are numbered PI-1 to PI-4, according to the number of the targeted managerial challenge to avoid confusion):

PI-1: If the organizational structure is decentralized, this can lead to unconsciousness of previous, similar experiences of IS integration and M&A and also limit the ability to learn on a corporate level from project to project. In other words, *to achieve improvements, from time to time, some special measures, such as cross organizational collaboration groups, standardization when possible, transfer of knowledgeable individuals, and mandatory evaluation and documentation that ensure information spread from unit to unit and from unit to corporate level need to be taken if the organization is decentralized*.

PI-2: As M&A-related integration of IS is the result of external triggers rather than autonomy and willingness, the processes are likely to provoke exploitive rather than explorative learning. *As the explorative learning normally is an important complement, it can be beneficial to engage in this learning of IS integration by itself*.

PI-3: Heterogeneous IS are hampering learning processes of IS integration. Therefore *advantages of specific IS for one unit should be compared to the hampering effects on organizational learning. If no reason exists for a heterogeneous IS base, standardization in systems and processes is desirable*.

PI-4: Since IS integration knowledge seems to be hard to externalize, companies needs to be careful how this knowledge is spread within the company. If consultants are used, the knowledge normally walks out the door. *If the company frequently engages in M&As and needs to develop a strong IS integration capability, using internal IS professionals can enhance that capability.*

11.1.4 Testing: Evaluation of propositions

The four propositions PI-1 to PI 4 were assed by alpha, beta, and gamma-testing against the criteria of importance, accessibility and suitability. For each of the propositions given, evaluators were asked to rate their subjective assessment of a) importance, b) accessibility and c) suitability on a 7-graded scale. The number of responses does not permit any statistical analysis, but can be used as indicators of how the evaluators perceived the propositions. Responses were given as a part of the verbal evaluation and always accompanied with motivation to give a richer assessment. The numerical responses are here presented as summarizing indicators, meaning that if all the evaluators gave 6 or 7, it indicates that they to a high extent agreed to the proposition being important, accessible or suitable. If the evaluators generally gave 1 or 2, this can be seen as something being wrong with the proposition and a reason to further discuss the issue and ask for suggestions for improvements.

A list of evaluators engaged in this step is provided as Appendix H. Evaluations were made with 5 senior IS professionals which were selected based on their experience of IS integration in M&A. These professionals were not considered to be the primarily group of users since they could rely on their comprehensive experience from previous M&As. Their input was foremost rated for conditions of importance and suitability.

A group of evaluators that could be seen as potential users were the four junior IS professionals included in the evaluation. If they were faced with an IS integration project, they could hardly be expected to tackle it appropriately, since they lacked prior experience of IS integration in M&A. Although lacking knowledge of IS integration in M&A, their primarily contribution would be to evaluate the accessibility of the propositions, i.e., if they would know how to interpret and use the propositions.

Two fellow researchers were involved in initial evaluation, doing reviews of everything from spelling to theory inclusion. Their most important contribution was assuring the link to existing theory.

The complete evaluations cannot be presented here, just as chapter 7 did not include complete interview transcripts to give an account of the four case studies. The evaluation is instead synthesized and presented as general themes, consensus and divergent opinions in the following. In the presentation most emphasis was given when a

proposition was rated low in any of the three evaluation criteria as this gave rise to considering changes or the evaluators suggested improvements themselves.

PI-1: Not much needs to be said about this proposition. All evaluators gave high values (6 or 7) for all three criteria and expressed that it was indeed an important contribution. The senior IS professionals with experience from several integration projects agreed that this proposal was not only true, but also the conditions for triggering it were widely present. "At least, almost all manufacturing companies in Scandinavia, and probably also throughout Europe are decentralized, and if they do not have any common unit specifically for integration, which they very seldom have, they will experience the same problem" (S2).

PI-2: As for the first proposition, this suggestion also seemed uncontroversial and was generally rated with 6 or 7 by the evaluators. However, one of the junior IS professionals which had experience from IS integration in M&A considered the proposition to be too simplistic: "It is more complex than so… you will never try anything new in relation to an M&A. Then you do what you already know because of the time pressure. The only way to learn completely new ways is to try things in an non-M&A related case first and when you know how to do you might use it to integrate an M&A" (J1). This is actually what was meant by the proposition, but since the propositions failed to communicate this idea, it had to be adjusted.

PI-3: All evaluators agreed that the effect of heterogeneous vs homogenous IS in the organization was an important issue (rates 5-7), however the suitability of the proposition was questioned by some evaluators: "There are still too few M&As in a normal Scandinavian company to learn how specific IS can be integrated. What can be learnt from time to time are methodological aspects, rather than systems skills" (S2). He was not the only one expressing this view: "You have to differ between knowledge of methods and

technical knowledge of the systems. While the latter is specific, method knowledge can be reused." (J1).

PI-4: If there was little consensus about PI-3, opinions differed even more for PI-4. Ratings were scattered evenly throughout the whole span from 1 to 7. While one senior evaluator stated "No further comments (7 all over). I totally agree" (S1), another senior IS professional rated 2 for both importance and suitability: "Most companies do not engage that frequently in M&As. For them it would be better to always use external consultant who do this frequently" (S2). No real trend can be spotted in the evaluations, thus, it simply seems to represent very diverging opinions. Some might be explained by the accompanying low values of accessibility, but also after extensive explanations and rechecking that the proposition was correctly understood, opinions substantially diverged.

Table 11.1 summarizes the evaluation of proposition PI-1 to PI-4. A rough estimation is made based on the answers: "high" means mostly 6 and 7, "moderate" mostly answers in the span of 3-5, and "low" means mostly ratings 1 and 2.

Table 11.1 Evaluation of design propositions for improving the IS integration capability over time

Proposition	*Importance*	*Accessibility*	*Suitability*
P1:	High	High	High
P2:	High	High	High
P3:	Moderate	High/Moderate	Moderate
P4:	Scattered	Moderate/Low	Scattered

11.1.5 Reflection: Modification of propositions

Regarding the evaluation as a whole, the propositions were mainly very well received by the evaluators. Perhaps a little surprisingly, most critical were fellow researchers and junior IS professionals, whereas the senior IS professionals were the most positive and frequently expressed situations in which the propositions could have made a difference. As propositions PI-1 and PI-2 were entirely positively met, there was no need to consider changes to the propositions. For PI-3 the relatively

moderate criticism can be summarized as follows. When not enough emphasis was put on a specific knowledge it related not only to the technical aspects of IS integration, but (according to some evaluators) to a more general awareness of which decisions were going to be made and the type of integration methodology. PI-4 modifications are more problematic since comments and rating seem to be scattered. Some divergence can be explained by the low rates in accessibility. An attempt is here made to reformulate the proposition to be more accessible, but the propositions need then to go through further evaluation.

After implementing the suggested changes, the modified propositions are as follows:

PI-3: Heterogeneous IS are hampering learning processes of technical aspects of IS integration. Therefore, *advantages of specific IS for one unit should be compared to the hampering effects on organizational learning. If no reason exists for a heterogeneous IS base, standardization in systems and processes is desirable*.

PI-4: Since IS integration knowledge seems to be hard to externalize, companies need to be careful how this knowledge is spread within the company. If consultants are used, the knowledge normally walks out the door. Consultants may have general knowledge of IS integration methods and processes from numerous M&As that the company who seldom engages in M&As could benefit from, but *if the company frequently engages in M&As and needs to develop a strong IS integration capability, using internal IS professionals can enhance that capability.*

11.2 Challenge II: Leveraging synergies with IS integration

Experiences from this and other studies (e.g. Mehta & Hirschheim, 2007; Epstein Marc, 2004; Epstein Marc, 2005; Gregor & Jones, 2007; Miller, 2007; Sherman & Rupert, 2006) show that the increase in M&A activity is a result of contemporary business to a higher extent using the act as a means of corporate strategy. M&A's are principally

driven by a desire to develop business and in the end increase the value for shareholders. The second managerial challenge approached in this thesis is the one of determining the IS integration needed to leverage synergies in an M&A.

11.2.1 Problem: Anticipating the importance of IS integration

A frequent topic of debate is the importance of IS integration for the M&A act. As depicted in chapter 1, numerous academics have argued that IS integration is not given the necessary attention. Still IS integration is reported being treated as a marginal issue in most M&As. One soon recognizes that the importance of IS integration is not equal in all M&As. For example, in merging banks of similar size and negotiation power, IS integration would definitively be crucial to leverage the anticipated synergies. On the other hand, M&As are reported driven by reasons such as acquiring a specific technical solution or patent. In these cases IS integration logically might not have a role to fulfill. In the four cases above IS integration work of very different magnitude was depicted. Representatives from Trelleborg Sealing Solution expressed their view: "We don't bother what IS they got. We're going to replace it anyway." In the Kléber case the related restructuration was tightly dependent on far reaching IS integration to fully leverage the potential synergies. On the other hand, integration needed in the CRP case was only marginal. As the importance of IS integration fluctuates heavily from case to case, there is a need of being able to roughly anticipate the importance that IS integration is going to have for the leveraging of synergies. If the importance is only of limited cognitive load, resources can be devoted to other aspects of the M&A. On the other hand, if some sort of IS integration-critical M&A can be defined, this would constitute support requirements for managers and IS professional.

Of the six dimensions in the framework for IS integration in M&A, one represents the starting point for this challenge: Dimension A, Synergistic potential. Regarding the M&A process as depicted in this study, a prevailing condition for all decisions is the synergistic benefits potentially achievable by the combination and also the synergistic benefits strived for. Therefore, it is here argued that there is a managerial need to link these synergistic effects to IS integration

aspects. The case studies presented a clear difference in the need for IS integration dependent on the synergetic effects strived for. The findings in this study may help inform professionals involved in the M&A with the issue of determining if IS integration is a critical aspect to consider in a specific M&A.

11.2.2 Kernel theory: Relations Synergetic potential - IS integration

Returning to Figure 9.1, which displays the dynamic system of IS integration in M&A, two direct relations between synergistic potential and the three IS integration dimensions were found. First, prior research had concluded that a proactive approach to IS integration (meaning inclusion in the due diligence phase) would enhance the possibility of the M&A initiative to participate in increased shareholder value. Considering the match of IS already during the due diligence phase would foresee cumbersome IS integration that destroyed the value of potential synergies. What then was seen in the four case studies was that IS integration issues tended to play a minor role during the due diligence phase, but it was not by ignorance, laziness or indolent management that this was taking place. Rather, it was a reflected and considered decision by informed managers. Instead, the proactive IS measures taken were taken well before the due diligence process. It was the creation of a IS integration capability and an information infrastructure, possibly to extend with inclusion of new units or by facing existing IS to additional IS.

Second, when combining the findings from the CRP and Kléber cases, it becomes clear how much the types of synergies sought for actually matters for the IS integration. From the CRP case, it was learnt that if synergies in marketing and sales only are sought, the need for anything above Infrastructural IS is limited. On the other hand, one has to consider the limitations posed by only integrating infrastructural IS. The synergies reached in the Kléber case could not have been reached by only integrating Infrastructural IS. Rather, leveraging synergies in production, scheduling, and logistics demanded integration in Transactional IS – an integration that demanded far more resources – was relatively complex, and in addition posed more changes for the employees and their way to do the job. When reconsidering the

framework, this was then referred to a relation between operational IS integration and synergetic potential.

In addition to these two direct (first order) relations, the dynamic system includes an additional set of second order relations between synergetic potential and IS integration. Figure 11.1 presents both first order and second order relations. The meaning of each relation can be found in Table 9.4.

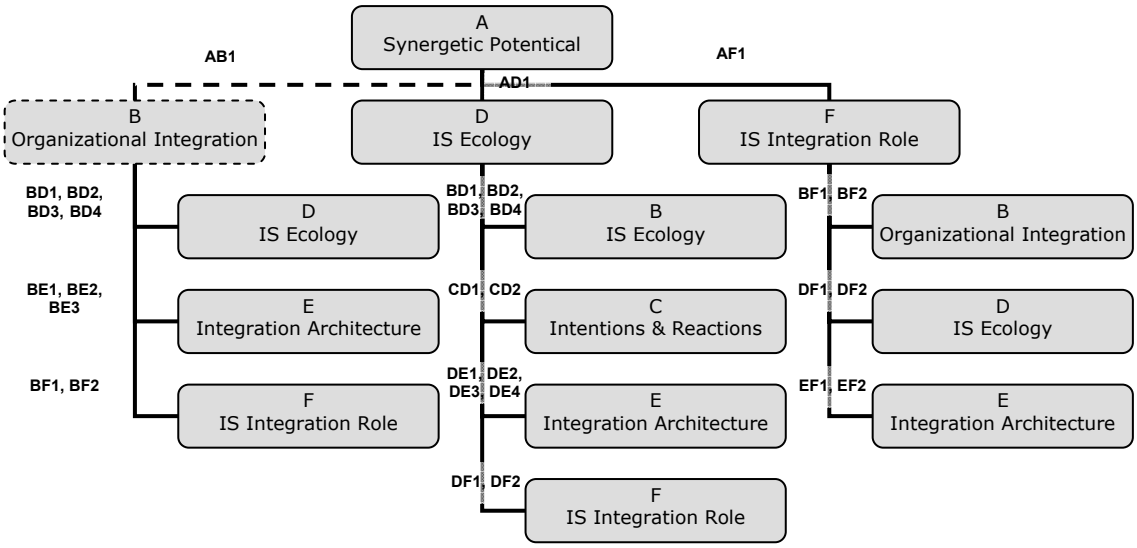


Figure 11.1. First and second order relations between synergetic potential and IS integration. Dimension B, Organizational Integration, is not a IS integration dimension in itself, but serves as proxy to other IS integration dimensions. For descriptions of the relations, see Table 9.4.

By relating to IS integration role and IS ecology as described above, these two dimensions act as proxies to other dimensions. The relation between synergistic potential and IS integration role, in turn, leads to effects on synergies and the three dimensions of Organizational Integration, IS Ecology and Integration Architecture. It is possible to discern a pattern where the required alternatives of organizational integration demand a proactive approach in terms of IS integration capability, whereas a reactive approach only was suitable for preservation strategy. This seems to be due to the fact that preservation only requires integration in Infrastructural IS, which is a matter that can be treated reactively. We also learnt in the Chase-Walton case that not all activities in a company are of equal importance, thus it makes sense to focus proactiveness on ensuring the integration of critical

activities. Lastly, there is a natural indication that a proactive approach to IS integration is more likely to end up in Enterprise-Wide integration, compared to the reactive approach which would be more likely to transform existing systems.

The second direct relation, that to IS type, actually has relations to all other dimensions in the framework. The relation between synergistic potential and IS type, in brief, meant that most technical synergies only could be leveraged by integration in Transactional IS. The extended IS integration has a mutual dependency on organizational integration; to achieve IS integration the organization needs to become integrated and vice versa. The difference in need of integrating different IS types for different synergies is also one of the explanations why in some M&As, where a limited set of integration demanding synergies are sought, IS integration can be approached reactively. Implications of selected types of IS for integration also have implications for the appropriate integration architecture. In general, the more importance of the IS system to the integrated activity, the more sense it makes to go for enterprise-wide architecture.

In addition to the two direct relations between synergetic potential and IS integration, there is also an additional relation between synergetic potential and degree of integration that triggers second order relations to all the three IS integration dimensions. The Organizational integration-dimension is not an IS integration dimension in itself, but by its relations to IS integration its relation with synergistic potential has implications for IS integration as well. In the Kléber case we learnt that extensive integration required by strived for synergistic benefits could be best implemented by enterprise-wide integration architecture. This lesson was also learnt in the Chase-Walton case. We can also see that as the leverage of synergies that demand far reaching organizational integration.

One could of course continue the quest for effects related to the synergistic potential in indefinite. All second order relations in turn triggers numerous third order relations, that in turn triggers fourth order, that in turn... and so on. The question is the usefulness when moving further away from the direct effects. As explained in the methodological discussion, the search for design proposition is most often a matter of searching for a sufficient good alternative, rather than the optimal. As a first preliminary suggestion of support on anticipation of IS integration importance, I will stop at the second order relations.

At this stage the information achieved is sufficient for the task. In the future, the effects of the synergistic potential can be traced further and used to refine the suggestions.

11.2.3 Prescription: Design propositions for determining the impact of IS integration on synergistic leverage

Based on the discussion above, a few general conclusions can be stated in the form of design propositions. As argued above, the propositions provide practical advices, but must be considered in a specific context. The proposition should be seen as rough pointers in what direction to go based on the desired synergistic effects.

PII-1: Some synergies generally requires more comprehensive IS integration than others for their leverage. Roughly speaking integration of a company's operational units is more complex and consumes more resources than integration of functional units, for example marketing, sales, management, and HR. *Consequently, if the company in the future would like to make M&As where synergistic effects are searched in production, logistics, or scheduling the company should assume a proactive strategy to IS integration in that the company develops the systems in an "extendable" way and makes sure their employees have the right training to do this extension smoothly.* Otherwise the risk of failing to leverage synergistic effects is high.

PII-2: The way modern companies are doing their business activities is to a large extent defined by their support of IS. Replacing an IS most often signifies that the way employees carry out their work is changed, which naturally can lead to reactions among the employees. The synergies sought in an M&A determine which types of IS need to be integrated which, in turn, affect the importance of considering employee reaction. This is because only integration in Operational IS is likely to transform the way the integrated unit is doing business. *Therefore, if the synergies strived for affect operational IS, employee reaction should be given close*

attention (explanation, motivation) by the management as to avoid resistance among employees.

PII-3: As mentioned above, leverage of synergies in production, logistics, and scheduling generally requires the most comprehensive IS integration. Of the architectural solutions available for IS integration (point-to-point, middleware, SOA, enterprise-wide, data warehouse), the enterprise-wide seems to be the one that requires complex integration. *Therefore, the higher the degree to which the companies in an M&A are expecting synergies in production, logistics and scheduling, the higher the chances for Enterprise-wide integration being the most appropriate option*.

PII-4: As noticed, synergies that only require integration of functional units do not require as complex bonds as operational integration. Therefore, this integration can more easily be dealt with; for example, middleware leaves the systems undisturbed and does not require organizational changes. *If synergies are sought that only will require integration of functional units, IS integration will become more of a technical rather than organizational change project. Since the effects of a technical project are easier to handle, less attention can be given when integration is directed only towards functional units.*

PII-5: The importance of the individual IS being targeted for integration to the organizations should be assessed. Some activities are critically dependent on their supporting IS. *If activities where IS is in the higher levels of importance are being integrated, IS integration should be a prioritized issue during the pre-M&A investigations since changes or disturbance in the IS will severely affect that activity. If only activities with low levels of IS dependency are being integrated IS, integration can be given less attention.*

11.2.4 Testing: Evaluation of propositions

If the evaluators were almost entirely positive when reviewing the first set of propositions, they were more dull when it came to the second challenge. Foremost, the evaluators had more trouble understanding what was meant. It was argued by both senior and junior evaluators that the propositions were not perceived as equally straightforward and did not equally well pinpoint critical issues with correct suggestions. Some evaluators said they had to read the propositions over and over to understand their implications. Even at the evaluation sessions they were more frequently misunderstood than the first set of principles.

The five propositions:

PII-1: "Operational" and "functional" was understood by about half of the evaluators. In addition, two senior evaluators argued that "sales" should be included in operational integration, which they argued as being more correct if regarding the information flows. They also contended that Porter's view of the value chain was of sales as a value-adding activity of the chain. Integration of the sales function was, according to the senior IS professionals, something very difficult for an integrator to do. In addition, the proposition was argued as "fuzzy", not really making a clear statement. The evaluators also wanted to know what was meant with "extendable". All in all, this gave fairly moderate ratings in all three evaluation criteria.

PII-2: Except from the above comment on "operational" vs "functional" integration, this proposition was well received. Evaluation also gave additional information that strengthened the proposition that if operational IS was affected, extra close attention should be given to human reaction: "The functional systems are more alike and thus easier to replace. An accounting system is about the same in every IS. It has to contain debit, credit, account, taxes etc." (S3). This is new knowledge, not incorporated in the proposition.

PII-3: Again, the argument was made that sales should be included in the units that required most resources for integration.

High ratings were given for importance and accessibility, but there was a strong disagreement whether an enterprise-wide approach could be recommended. “Enterprise wide solutions are very difficult to introduce in a short period of time,” said one of the senior IS professionals. (S2). “There simply are no good solutions to this problem. That is partly why companies are so keen on approach SOA. All existing alternative are painful, now they put their trust in the unknown, but they do not really know what they are embracing” (S4).

PII-4: “What you say is true, but yet, the situations where you use enterprise-wide solutions are most often used for functional use such as financial and HR since they are the easiest to transfer to enterprise wide solutions. This is kind of overshadowing that it could be made with middleware technology. Still, the conclusion that this type of integration becomes more of a technical project holds true” (S2). So, the conclusions were right, but for the wrong reasons. The junior IS professionals did agree with the proposition as presented, but this could be explained by the proposition apparently making a lot of sense conceptually and holding true on a theoretical level, but not being applicable in reality.

PII-5: Not much has to be said about this proposition. Everyone understood and agreed upon the proposition. Once again, the senior IS professionals gave almost entirely enthusiastic ratings to all three conditions, that is, as 7.

Table 11.2 summarizes the ratings given according to the same principles as were used for Table 11.2. A rough estimation is made based on the answers, were “high” means mostly 6 and 7, “moderate” mostly answers in the span 3-5, and “low” 1 and 2.

Table 11.2 Evaluation of design propositions for determining the impact of IS integration on synergistic leverage

Proposition	*Importance*	*Accessibility*	*Suitability*
P II-1:	Moderate	Low	Moderate
P II-2:	High	Moderate	Moderate
P II-3:	High	High	Scattered
P II-4:	High	High	Low/Moderate
P II-5:	High	High	High

11.2.5 Reflection: Modifications to the propositions

The only proposition that can be left completely without adjustment is PII-5, which achieved all over high rating. The use of "operational" vs "functional" units seems problematic. It was thought that IS professionals would be well aware of the terminology, but this was apparently a misconception. Thus, it is essential to explain what is meant by the terms. A suggested modification would be to include an explanation in the introduction to the design propositions. Explaining the difference in each proposition is simply not a feasible solution. Therefore, an extension and improvement of the introduction to the design propositions that includes an account and exemplification of the difference between operational and functional units is a suggested change.

For PII-1, "extendable" was also a problematic word. The desirable modification is a replacement of extendable with what the term actually refers to in practice. What makes an IS extendable?

PII-2 missed the logic that functional IS simply are more alike each other from a user perspective. The suggested change is not to extend the existing proposition, but instead to create a new one based on this logic. The new proposition could be stated as follows:

> IS supporting functional units, such as accounting and HR, are more alike each other than operational IS are, and a replacement is not forcing users to adopt new ways of working. *Therefore, if the synergies strive for only affect functional units, IS integration becomes more of a technical project and less an organizational change process.*

When comparing this to what is said to be the correct logic behind PII-4, it is basically the same. Therefore, this modification is reflected in the updated PII-4.

PII-3 may be considered for withdrawal since no consensus can be reached about the appropriateness. Since the propositions still are preliminary and need further testing, the proposition is maintained, keeping in mind the disagreement on suitability. Further evaluation may potentially explain the disagreement.

PII-4 should be updated according to the new logic. This means that the new propositions will be as follows:

PII-1: Some synergies generally require more comprehensive IS integration than others for their leverage. Roughly speaking, integration of a company's operational units is more complex and consumes more resources than integration of functional units, for example, marketing, sales, management, and HR. *Consequently, if the company in the future would like to make M&As where synergistic effects are sought in production, logistics, scheduling, or sales, the company should assume a proactive strategy to IS integration, that is, the company should prepare the IS so that new units can be added and their employees have the right training to do this extension smoothly.* Otherwise the risk of failing to leverage synergistic effects is high.

PII-4: IS supporting functional units, such as accounting and HR, are more alike each other than operational IS are, and an replacement is not forcing users to adopt new ways of working. *Therefore, if the synergies strive for only affect functional units, IS integration becomes more of a technical project and less an organizational change process.*

11.3 Challenge III: Choosing an integration architecture

Regardless of whether a company assumes a proactive or reactive approach to IS integration in M&A, and regardless of which synergies the act is supposed to enable, one managerial challenge that remains is to decide on *how* the information systems actually should be integrated to appropriately support the objectives of the consolidation.

"Overintegration" is not effective use of resources (Markus, 2000) and insufficient integration severely hampers synergy leverage.

The fundaments for approaching this managerial challenge was given by Dudas and Tobission during their master thesis work (2007).

11.3.1 Problem: Choosing an integration architecture

The third, and last, managerial challenge approached in this thesis is the matter of choosing the appropriate integration architecture for the information systems involved. The options can be found in the framework's Dimension D: IS integration Architecture. Point-to-point, Middleware, Service Orientation, Enterprise-wide and Data Warehouse – the approaches all have specific characteristics that lead to advantages and disadvantages in specific contexts. The alternatives are in depth accounted for in chapter 2 which deals with the theoretical underpinnings of IS integration.

The problem was highly present in the four cases studies described in chapter 7. For example, in the Kléber case it was first decided to preserve the existing systems and to integrate them by middleware and to a limited extent point-to-point architecture. Not until the plans were formalized and the necessary resources summarized in 1998, did it become clear that the cost could never be met by future savings or increased sales. The project became so complex that it was regarded as being more efficient to replace the existing systems with one enterprise wide system. This could be made fairly easily since the importance of a specific IS to the activities were limited. Therefore, a standard package system could be used with only limited modifications. Later, it was also depicted that the enterprise-wide architecture could be reused in the Dynaflex case. As the IS system was of limited significance to the business of Dynaflex, it was most cost efficient to just use the systems already in place.

Also, in the Chase-Walton case the integration architecture was a decision linked to the importance of IS and complexity of integration with different architectures. For the prioritized activities (marketing, sales, logistics), it was decided that common systems should be used to enable the required integration, and for activities in the outskirts of the business, such as production, functional system could be used. Required integration was made by point-to-point connections and, if necessary, with spreadsheet programs.

The problem of choosing appropriately is one of understanding and matching the requirements of the integration, that is, the setup and the characteristics of the alternatives. The strived for solution can be costly to implement as well as to maintain. None of the alternatives is technically trivial to implement and they may all have organizational impact (Markus, 2000, Linthicum, 2000). It is also possible to achieve technical success without achieving business success (Markus, 2000). As Markus claims:

> Consequently, organizations may acquire more systems integration than they need for business reasons or they may have the wrong kinds of systems integration than they need for business reasons. (Markus, 2000)

In conclusion, poorly grounded IS integration choices are likely to have business associated consequences for the outcome of an M&A. If appropriately made, the synergistic potential can be reached with a minimum of resources spent and with only the desired organizational impact to deal with.

11.3.2 Kernel theory: Foundation of decision influences

The current objective of this piece of prescriptive contribution is not to address *when* or *how* the architectural decision should be made. The sole focus is on *which* options out of the possible architectural designs are appropriate in which settings. The when-question was partly addressed in Chapter 9, and also indirectly in the discussion on IS integration capability. The distinction means that there currently is no interest in the two process dimensions of the framework as they are concerned with how the process takes place.

Returning to the aggregation of the framework and the relations found between the dimension that was presented at the end of the last chapter, we can see that of the three resuming dimensions that may influence the choice of integration architecture, only two of the dimensions' influences have been captured by the studies. The data from the studies has only limited suggestions on the relation to Dimension A: Synergetic Potential. In the account for the case studies this data was not considered sufficient to indicate any direct dependency, but rather influenced through the other dimensions. Based on the premise that the managerial support presented in this thesis is

said to build upon a solid theoretical kernel, that is what distinguishes it from other means already in use, the managerial support will be built upon the trinity of "integration architecture", "organizational integration" and "is ecology" (Figure 11.2) – those three dimensions which match this managerial challenge and on which there are theoretical understandings. The operational-functional distinction is not included here since the relation is rather obvious. Operational integration was more resource demanding and should lead to higher use of the more enabling technologies. Introducing this variable would also complicate the picture more than it would clarify. When it comes to the integration level, it would be an alternative to do a similar model for the integration level, but the theoretical material does not as clearly point out when the alternatives are appropriate as it does when it comes to structure.

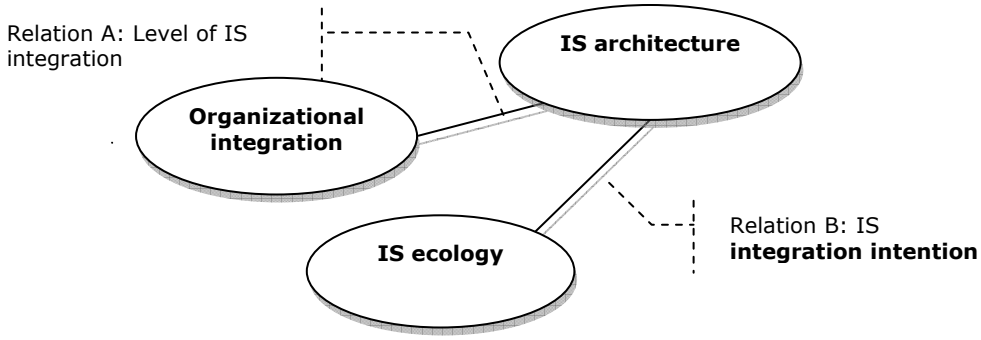


Figure 11.2 Theoretical kernel for the propositions on Challenge III.

The combination of Dimension B: Organizational integration and Dimension E: IS architecture is at the bottom line a question of how tightly one wants the two units functioning together. The theoretical walkthrough of architectural alternatives revealed that the approaches have distinct characters when it comes to resources needed for implementation, effectiveness in small and large scale implementation, and potential for future integration and disintegration projects. From the case studies three identified relations can be extracted that help explain the appropriateness of an architecture in relation to the overall organizational integration:

Relation BE1 suggests that middleware integration becomes too complex when the strived for integration level is total. Not that it is impossible to achieve, but the complete integration is most effectively achieved by an enterprise-wide architecture.

Relation BE2 presents a different view. Here it is put forward that any desired integration could be seen as a lowest possible level, and it could actually be profitable to 'overintegrate' by cost saving argumentation.

Relation BE3 provides further information on the relation of the integration level and appropriate architecture as it is based on the Chase-Walton case which contained elements of several integration approaches and integration levels. It manifests a high level of critical integration which should be implemented by Enterprise-Wide architecture and also shows a potential for ad hoc point-to-point integration.

Any organization's information infrastructure consists of several very different information systems that serve different organizational needs. The fundament for incorporating Dimension C: IS type into the framework was a suggestion that it could be expected that different systems should require different approaches to integration. This initial hypothesis was found true and on the relation IS type – Integration Architecture the following relations were found:

Relation DE1 suggest that if the IS is of high strategic value to the unit, middleware or point-to-point integration could be favored so as not to destroy key capabilities within the unit.

Relation DE2 and DE3 express how the importance of the IS integration decision diminishes as the strategic importance of the IS decreases. If strategic importance is low, factors other than integration need could decide the appropriate information infrastructure.

Relation DE4 restates the need to consider the importance of the specific systems at hand. Enterprise-wide integration was only needed for strategic business tasks.

11.3.3 Prescription: A relational model

We have two dimensions that should influence the decision of integration architecture. On the one hand, we have the organizational integration, and on the other, the IS type in case. These two dimensions may be expressed as axis on a two dimensional matrix. Note that none of the dimensions are continuous, but rather values representing discrete states, although some include a form of progression. Absorption clearly signifies more integration than

Preservation, just as Strategic IS represent higher importance of the IS than Infrastructural.

Before presenting what is what in the model in detail, a word on what is not in the model. The Holding alternative does not imply any integration. Not in terms of organization, nor in IS. Therefore this alternative demands no choice of integration architecture and, hence, these quadrants are left blank. The model only addresses three of the five possible integration architectures. The SOA-alternative is omitted for two reasons. First, there is hardly any theoretical work done on this principle for organizing IS, and nor did any of the four cases touch upon this alternative; consequently, any inclusion of this architectural principle would be based on nothing but pure guesses and speculation. Second, SOA is by nature more of a paradigm shift that is a careful long term strategic issue, and not related to one specific M&A. For more information on which implications SOA may have on M&A-related integration, Henningsson et al. (2007) is recommended. The meta level (data warehouse) approach is, as explained in chapter 2, an alternative to integration, rather than an integration architecture in itself. It is, like SOA, here regarded as an alternative to existing integration architectures that can be considered in specific cases. The case for data warehouses should logically be a preservation case, where IS are regarded as Informational. A data warehouse would enable transparency of activities, but no real integration or the benefits that come out of it.

In the four case stories above, the most preferred integration solution was Enterprise-Wide architecture. Especially complex integration was argued best implemented in this manner. Both theory and investigated practice suggest that the integration strived for within an absorption is most appropriately perused by an Enterprise-wide architecture. The exception is when the IS are of strategic importance to the unit in quest of absorption. In this case caution must be taken before switching systems. However, if this situation becomes topical, it is a sign that something is problematic with the logic behind the deal. Complete absorption signifies the transformation of business processes, information flows, organization structure, learning mechanism and many other organizational aspects that, at the bottom line, logically signify that any strategic processes within the units will be altered. For the rest of the absorption quadrants, the enterprise-wide approach is natural. Further, the case stories also showed that if the IS were of moderate or lower strategic importance in the symbiosis approach,

enterprise-wide integration could render cost savings and provide integration with minimum complexity.

Middelware technologies were not that widely used in the case studies, but have a clear role for integration projects according to the existing theory. It is primarily aimed at situations that were keeping the existing IS in place that would be of strategic importance to the units. The alternatives are thus middleware or point-to-point where very few arguments in general are raised in favor of point-to-point architecture. The middleware alternative can also come in question for preservation cases where transaction IS are of integration interest. Transaction integration is however normally a technically demanding task and transaction integration without an enterprise-wide approach is a decision one might reconsider later. In the Kléber case this was searched for at the start, but found too resource demanding. On the other hand, an enterprise-wide approach will automatically be a step towards absorption as the units will have to change, and naturally differentiate from the desired preservation.

In the theoretical review, point-to-point architecture is generally not recommended. However, there are cases where the characteristics might be appropriate. Where the integration need is Preservation and the IS supporting is of limited strategic importance, there can be arguments made that a point-to-point solution will enable the target company to preserve their business processes, while at the same time a sharing of the same resources such as a data base. This is considered dependant on the scope of this integration. If the necessary numbers of interfaces are few, and it is carried out over a limited amount of time, this can be a quick-and-dirty solution that meets the need. It is the relative speed of implementing a small number of interfaces that theoretically justifies this. Otherwise, there are no justifications for the use of the point-to-point integration approach.

Figure 11.3 graphically presents the discussion above on how the different integration architectures are appropriate for different M&A settings. The graphical representations should be interpreted in the light of the explanatory text above and not as absolute statements of appropriateness. The use is, as mentioned earlier, dependent on certain conditions. The span of the different architectures may also exceed the marked areas under certain conditions, but the recommendation should then be to reconsider the decision extra carefully since the strategic match then likely contains inconsistencies. For example, whether an

absorption without an enterprise-wide strategy would be more of a preservation. And vice versa, preservation and enterprise-wide integration is logically not compatible.

11.3.4 Testing: Evaluation of the relational model

If comparing the response to the three sets of propositions, the evaluators were most positive to the suggestion on how to address the third managerial challenge.

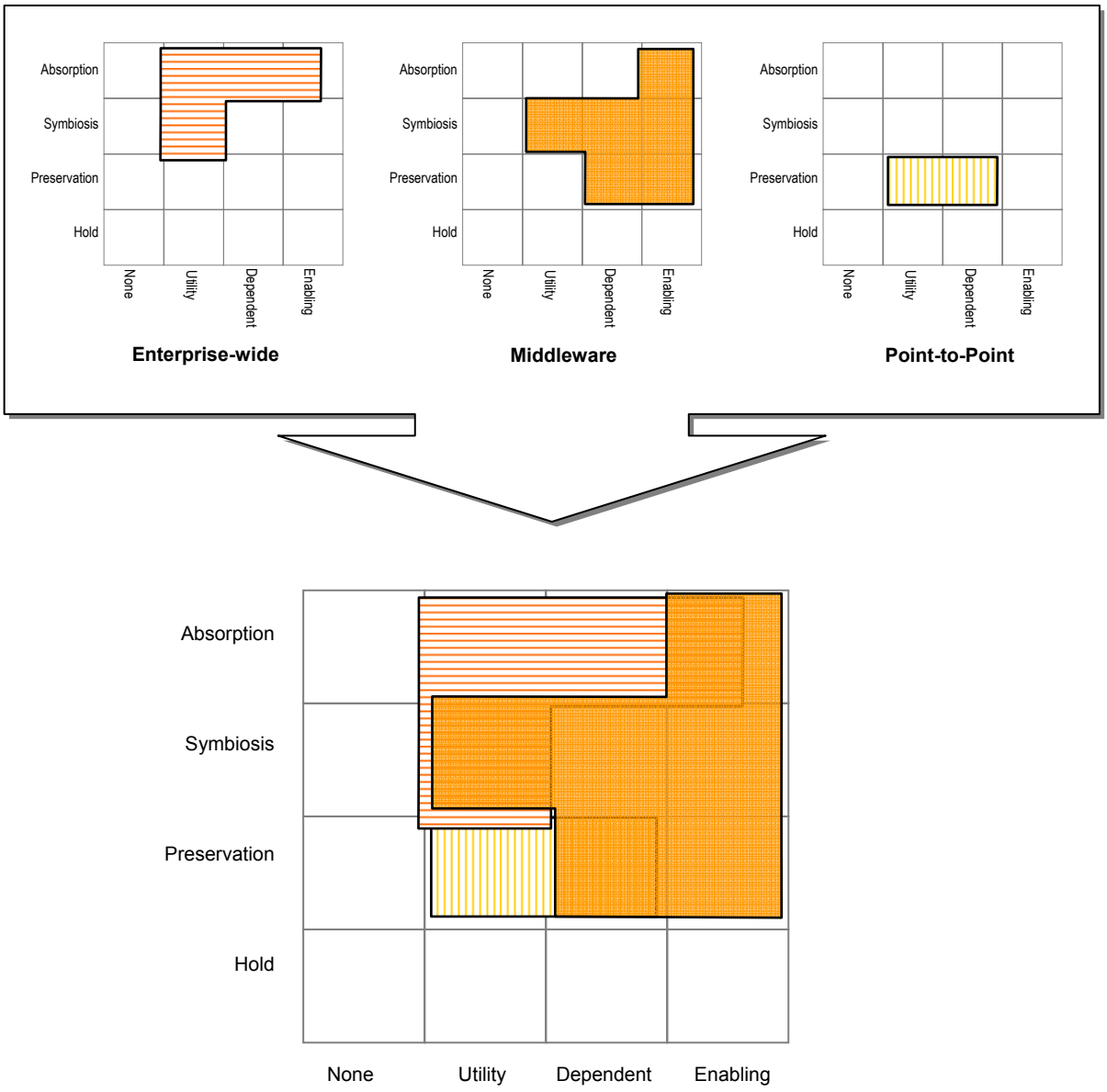


Figure 11.3 A model to guide selection of integration architecture in M&A

- Importance: All evaluators agreed that choosing the integration architecture was one of the most critical challenges for management of IS integration in M&A, and also put forward as one of the most critical choices of the entire M&A, not only among the IS-related decisions. However, the general opinion was that the choice was not a matter of right or wrong, but of better or worse (or as someone expressed it: "of bad or terrible"). Evaluators appreciated both the challenge and the way the challenge was addressed: "A model of this kind is clearly of very high relevance, and the particular model you have developed seems to be suitable for guiding such decisions. It is clear, easy to comprehend, and provides concrete instruction." (R1). One opinion was that the model was too comprehensive in its strived for application: "Don't boil the ocean! Creating a model like this for the manufacturing industry would be extremely useful. For other industries, other conditions and another scale will apply for determining 'importance' of IS. Limiting the scope for a first version will improve the model. Then it can be extended to other industries" (S2)
- Somewhat lower ratings were given for accessibility: "I would not be sure how to define whether an IS was 'utility' or 'dependent', by intuition. I would not some help in determining the role of my IS," one senior evaluator (S2) said and continued: "If you can create a set of question that leads me to one of the squares in the matrix the model would be extremely usefully." About half of the evaluators expressed that they would have found it hard to place a specific IS into one of the squares without additional help.
- There was a general consensus among the evaluators that they would never let a model like this decide which architecture to use, but that the proposition could be helpful in assisting them to make that decision. "I would not let the model decide, but I would certainly give it another thought if our suggestion was completely different from the one of the model. I could certainly use this model as a basis for discussion the next time we do an M&A" (S3). The decision to leave out SOA was met in two ways, about half of the evaluators thought themselves not knowing enough about SOA to comment, while the other half agree to SOA not fitting into the model: "SOA is indeed

something completely different that would not fit in the model. SOA is not primarily a managerial decision for one integration, but a fundamental strategic decision" (S2).

11.3.5 Reflection: Modifications to the relational model

The opinions of the evaluators that they would not rely on the model for making a decision of integration architecture, but would use the model as a foundation for discussion is entirely in line with the intended use. The model is not, as explained, a recipe-like instruction, but a supporting tool for the IS professionals in making better decisions.

It was suggested that as an initial model, the scope should only be set to the manufacturing industry at this stage. The relevance of this suggestion becomes apparent when trying to follow one of the other suggestions to create questions that would help the user determine in which square of the matrix the IS at hand would fall. For example, for the manufacturing and finance industry, different questions would need to be asked. IS in the manufacturing industry will seldom (if ever) be as important for the business as IS are for the finance industry where "about every IS is strategic." Therefore, from now on the model is said to foremost concentrate on the manufacturing industry with potential future extension to other industries.

The model is thus enhanced with a set of conditions for determining the importance of a specific IS (Broadbent & Weill, 1997):

- If the IS acts as the means to achieving future strategic change, it is enabling.
- If current strategic needs rely heavily on IS integration, then the role of IS is dependant.
- If there is focus on the sharing of resources, and economies of scale, then IS is utility.
- If the IS is of mere infrastructural nature – it is only IT, and then the strategic importance of that specific IS is none.

There are other more sophisticated ways of directing the importance of IS into one field of the matrix, such as decision threes or balanced

scorecards, but one reason why the model was so well received by the IS professionals was said to be because of its simplicity. Acting as an enabler for discussion and not as a formal decisions calculator, it is here argued that the model is easily comprehended and fast to use. Hence, simplicity is essential. Further evaluation would clarify if these four simple conditions are enough or whether more sophisticated ways of determining strategic importance of a specific IS are required.

11.4 Contribution of Chapter 11

Chapter 11 has developed prescriptive knowledge to be used by IS professionals when facing the task of IS integration in the context of corporate M&A. The chapter started with an account for IS design science and its contribution to IS research. The role of IS design science is for IS use and management as a complement to IS design science with the ambition to develop IT artifacts. Three managerial challenges related to IS integration in M&A were identified for which there in sufficient theoretical support to create prescriptive statements in the form of heuristic design propositions. The statements were evaluated through tests with fellow researchers and IS professionals.

11.4.1 Challenge I: Improving the integration capability

The first challenge addressed in this chapter was the issue of improving the ability to do integration from one time to another. Table 11.3 summarizes the response to this challenge.

Table 11.3 A design theory for improvement of the IS integration capability related to M&A (table structure adapted from Gregor, 2006)

Overview	
Support for IS professionals trying to improve their M&A related IS integration capability from one M&A to the next.	
Component	**Instantiation**
Means of represent.	Words
Primary constructs	IS integration capability, learning, M&A
Statement of relationships	Providing IS professionals with guidance for improving the IS integration capability related to M&As over time
Scope	Management of IS integration in M&A
Causal explanations	The underlying kernel theory is drawn from the DySIIM model in chapter 9 which builds on theories for IS integration, M&A, and organizational learning
Testable propositions	The four propositions may be continuously improved by use and evaluation

Prescriptive statements (Design propositions)	PI-1: If improvements should be made from time to time, some special measures, such as cross organizational collaboration groups, standardization when possible, transfer of knowledgeable individuals, and mandatory evaluation and documentation, that ensure information spread from unit to unit and from unit to corporate level needs to be taken if the organization is decentralized. PI-2: If the company should improve radically, it can be beneficial to by itself engage in explorative learning of IS integration as the M&A context is likely to foster a exploitative approach. PI-3: If no reason exists for a heterogeneous IS base, standardization in systems and processes are desirable. PI-4: If the company frequently engages in M&As and needs to develop a strong IS integration capability, using internal IS professionals and not consultants can enhance that capability.

It was argued that from an IS management perspective, it was impossible to anticipate exactly which integration work was going to be required in the future, but if having M&As as a part of the corporate growth strategy, it was important to improve the integration ability from one M&A to the next. After evaluation, the design propositions were set as can be found in Table 11.3, which also summarize the contribution in the shape of a design theory for support to IS professionals trying to improve their M&A related IS integration capability from one M&A to the next.

11.4.2 Challenge II: Determining the impact of IS integration on synergy leverage

After trying to support IS managers with the task of improving the IS integration capability the focus was set to synergy leverage in one specific M&A, and how IS integration related to different synergies. The design theory that was developed is summarized in Table 11.4.

Table 11.4 A design theory for determining the impact of IS integration on synergy leverage in M&A (structure adapted from Gregor, 2006)

Overview	
Design propositions to guide IS professionals in assessing the impact of IS integration for the leverage of synergies in an M&A	
Component	**Instantiation**
Means of representation	Words
Primary constructs	IS integration, Organizational integration, Synergy
Statement of relationships	Providing IS professionals with guidance for assessing the impact of IS integration on synergy leverage
Scope	Management of IS integration in M&A
Causal explanations	The underlying kernel theory is drawn from the DySIIM model in chapter 9 which builds on theories for IS integration, M&A, and organizational learning
Testable propositions	The five propositions may be continuously improved by use and evaluation

Prescriptive statements (Design propositions)	PII-1: If the company in the future would like to make M&As where synergistic effects are searched in production, logistics, or scheduling the company should assume a proactive strategy to IS integration in that the company develops the systems in an "extendable" way and make sure their employees have the right training to do this extension smoothly. Otherwise the risk of failing to leverage synergistic effects is high PII-2: If the synergies strived for affects operational IS, employee reaction should be given close attention (explanation, motivation) by the management as to avoid resistance among employees. PII-3: To the higher degree the companies in an M&A are expecting synergies in production, logistics and scheduling the higher chances for Enterprise-wide integration being the most appropriate option PII-4: if the synergies strived for only affect functional units, IS integration becomes more of a technical project and less an organizational change process. PII-5: If activities where IS is in the higher levels of importance are being integrated, IS integration should be a prioritized issue during the pre-M&A investigations since changes or disturbance in the IS will severely affect that activity. If only activities with low levels of IS dependency are being integrated IS integration can be given less attention

11.4.3 Challenge III: Choosing an integration architecture

The third managerial challenge approached in this thesis was the topical question of which integration architecture to choose when actually implementing an integration solution. It was also on these propositions that the opinion among IS professionals were the strongest. The propositions are perhaps best viewed in Figure 11.3 but the model in the form of prescriptive theory is summarized in Table 11.5.

Table 11.5 A design theory for choosing an integration architecture for IS integration in M&A (structure adapted from Gregor, 2006)

Overview	
A model for choosing integration architecture for IS integration in M&A	
Component	**Instantiation**
Means of representation	Words, figure
Primary constructs	IS integration, Organizational integration, Synergy
Statement of relationships	Providing IS professionals with guidance for selecting an architecture for IS integration in an M&A
Scope	Management of IS integration in M&A
Causal explanations	The underlying kernel theory is drawn from the DySIIM model in chapter 9 which builds on theories for IS integration, M&A, and organizational learning
Testable propositions	The borders of each architecture may be evaluated and tested by further use
Prescriptive statements (Design propositions)	See Figure 6.7

Part IV:

Epilogue

12. Research contributions and conclusions

This final chapter summarizes contributions made in this research and draws general conclusions based on the contribution. It discusses research quality attributes, as well as trends within the field of IS integration in M&A, and future research needs.

12.1 Knowledge contribution

The starting point of this thesis was two identified gaps related to IS integration in M&A. The first gap is the lack of theory that appropriately explains the relationship between IS integration and the general M&A process. The importance of the relationship has been emphasized, but the fragmented and tentative research domain has not been able to explain the connection. The second identified gap was the lack of theoretically grounded knowledge that could assist in the management of IS integration in M&A. With a twofold purpose, this thesis has searched to fill these two breaches. First, the task was set *to develop theory that explains the relationship between IS integration and the M&A context*. Second, the ambition was also *to support management of IS integration in M&A*.

Existing research on IS integration and M&A was amalgated into a preliminary theoretical framework for describing and explaining IS integration in the M&A context. The theoretical framework was applied on four M&A made by the industrial group Trelleborg AB. Using the framework to describe the M&A and related IS integration work revealed a number of relations that altogether gives a comprehensive account for the relationship between IS integration and the M&A context. Based on the explanatory theory, supportive guidelines in the form of design propositions were developed to help IS professionals faced with the task of IS integration in M&A. In order to fill the two gaps identified in the existing literature, theory for description, explanation, and prescription has been developed.

12.1.1 Theory for describing and explaining IS integration in M&A

Both IS and M&A are fuzzy concepts with indistinct boundaries that both cover several distinct objects. Therefore, a substantial part of the thesis has been devoted to straightening out the tangled vocabulary in order to set the ground for a precise discourse. The sorting out, comparing, contrasting, dissection, synthesizing, application of terms related to IS integration can be seen as an important contribution in itself. The more distinct vocabulary is a key feature for theory for analyzing, a type of descriptive theory (Gregor, 2006). The developed vocabulary is a part of the thesis' major descriptive contribution, the framework for describing and explaining IS integration in M&A. Using the framework, it should be possible to describe managerial decisions of IS integration in M&A and explain the consequences of the decisions taken. The framework is, in the terminology of Gregor (2006), theory for analyzing - analyzing IS integration in M&A and the relationship between the two.

The framework is based on the IS managers' tasks when a company decides to engage in M&A. It was argued in Chapter 1 that in order to achieve the highest possible degree of relevance to the community of IS practitioners, the framework had to aspire for comprehensiveness, rather than selecting a limited piece of theory and make a fragmented contribution, in line with suggestions on how to contribute to the solution of a real world problem (Pawson & Tilley, 1997; Tranfield et al., 2003). Drawing on theories of IS management, IS governance, and IS alignment, it was contended that the work of an IS manager included: a) selecting among the basic structural options for IS integration, and b) understanding the options related to the M&A context. Three dimensions of the framework integrated existing research on M&A into: A) synergetic potential, B) organizational integration, C) intention and reaction. Dimensions A and B are content based, while dimension C has a process focus. The basic structural options of IS integration were summarized into D) IS ecology, E) integration architecture, and F) IS integration role. Once again, the focus of the first two dimensions is on content, and the latter on the process.

Initially, a framework of six dimensions was developed, but after using the dimensions to the four cases at Trelleborg, it was argued that

apart from minor adjustments to the individual dimension, a substantial part of the explanation of IS integration in the four M&As was missed unless the M&As were seen in a wider timeframe and on a group level. Therefore, the framework was enhanced with a longitudinal dimension based on theories for organizational learning. The final version of the framework can be found in Table 9.3.

Recognizing the individual value of each dimension and additionally the combined potential to illuminate dynamics and relations between different aspects of IS integration in M&A it is suggested that the framework may be used for several purposes including:

- Describing managerial decisions of IS integration in M&A and explaining the consequences of decisions taken.
- Describing how different key aspects of M&As and IS integration are related and how they mutually affect each other leading to a final outcome.
- Describing and understanding how initial conditions and the integration process management jointly create the integration solution.
- Understanding both how a specific integration-related work task fits into a greater context as well as the nature and complexity of a comprehensive integration project.
- Conducting comparable case-studies that take into account the same aspects of several cases and enables accumulation of knowledge on M&As.
- Focusing attention of researchers and companies involved in M&A on the process' key aspects.
- Facilitating for companies to realize IS integration issues, decisions, and actions that a company has to consider in M&A processes.

One of the above proposed utilizations of the framework for IS integration was to use it to base comparative studies on the relationship between IS integration and M&A. As such basis, the framework was used in four case studies. By analyzing the cases from the dimensions of the framework, a substantial number of relations between aspects of IS

integration and M&A was discerned. Taken together, the 28 relations gives a comprehensive account for the relationship between IS integration and the general M&A process. All relations were explained in detail in Chapter 9, and aggregated into Table 9.4. The relations may be regarded individually as representing different mechanisms in themselves. However, the combined view presents a system of elements that are tightly interdependent. The dimensions and relations are depicted as a dynamic system. "Dynamic" in this case refers to the meaning of an active and changing system. With time, decisions and actions likely alter the properties of each dimension. Presenting it as a system embodies the idea of a set of elements connected together which form one entity, thus showing properties which are properties of the whole, rather than properties of its component parts (Checkland & Scholes, 1990). A system might be defined as a coherent set of interdependent components that exists for some purpose, has some stability, and can be usefully viewed as a whole (Checkland & Scholes, 1990). The interdependent components in this chase are the individual dimensions. Its purpose is to efficiently support the general M&A objectives, expressed by dimension A. Effects from M&As are long lasting, swells sometimes have impacts even after 10 or 20 years, and as long as these effects prevail, so does the relation between IS integration and M&A.

Systems have properties as a whole. The dynamic system of IS integration in M&A (DySIIM-model) has properties as a whole, such as resource use, lifetime, and impact on business. It also has, or at least could have, impact on other dynamic systems of IS integration in M&A. For example, which architectural principles that are used to realize integration, will have impact on future integration initiatives in accordance with the path dependency of emerging information infrastructures (c.f. Hanseth, 2000).

In Chapter 1 two research questions were posed which when answered should contribute to the study's first purpose to *develop theory that explains the relationship between IS integration and the general M&A process*:

> R1: Which aspects of IS integration and M&A are important to understand IS integration in the context of M&A?

R2: How do the different aspects of IS integration and M&A relate to each other?

The modified framework that eventually consisted of seven dimensions is useful to describe IS integration in M&A in order to explain the consequences of managerial decisions taken (Table 9.3) to provide the answer to the first research question. The DySIIM model (Figure 9.1, Table 9.4) is an attempt to provide an answer to the second research question. The model partly fulfills the first purpose of the study. Partly, because it is an initial model that needs further testing and refinement.

12.1.2 Theory for supporting management of IS integration in M&A

Describing and explaining an IS-related phenomenon that frequently has been depicted as "topical" or "urgent" by contemporary researchers and IS professionals should be a fairly uncontested part in the very core of IS research. The latter part of this thesis was concerned with IS research that contains a few innovative elements and that, rather than staying at the IS research core, approached the research frontline that seeks to address the relevance and utilization problem of traditional IS research. With so called IS design research, inspired by disciplines such as engineering and medicine, abstract knowledge that can be used by IS professional to solve classes of real world problems is developed. This developed knowledge can be seen as contribution of prescriptive theory (Gregor, 2006). Most IS design research has a focus on the IT artifact per se (Carlsson, 2006), but this thesis joins the group of IS researchers (Baskerville et al., 2007; Gregor & Jones, 2007; Hrastinski et al., 2007; Iivari, 2007; March & Smith, 1995; Venable, 2006; Carlsson, 2006), claiming that it is also fruitful for increasing the relevance of IS research to include design of IS integration use and management.

Following a discussion on the main challenges of IS managers for the future and the perceived managerial problems of IS integration in M&A, three specific managerial challenges were selected to go forward with. The first challenge addressed in Chapter 11 was the issue of improving the ability to pursue integration from one time to another. It was argued that from an IS management perspective, it was impossible to anticipate exactly which integration work was going to be required in the future, but if having M&As as a part of the corporate growth strategy, it was important to improve the integration ability from one

M&A to the next. After evaluation of the design propositions, the suggestions were set as can be found in Table 11.3, summarizing the contribution in the shape of a design theory for support to IS professionals trying to improve their M&A related IS integration capability from one M&A to the next.

After trying to support IS managers with the task of improving the IS integration capability, the focus was set to synergy leverage in one specific M&A, and how IS integration related to different synergies. The design theory that was developed is summarized in Table 11.4.

The third managerial challenge approached in this thesis was the very topical question of which integration architecture to choose when actually implementing an integration solution. It was also on these propositions that the opinions among IS professionals were the strongest. The propositions are perhaps best viewed in Figure 11.3 but the model in the form of prescriptive theory is summarized in Table 11.5.

The third research question posed in Chapter 1 was:

> R3: Given the output from research questions R1 and R2, how can this understanding be expressed as knowledge that support IS professionals concerned with IS integration in M&A?

The answer to that question comes in the form of the three initial design theories presented in Section 11.4. The propositions made in the theories were generally well received. After maing modifications, appreciation should be even higher.

12.2 Major conclusions and impact of research findings

Regarding the research findings and the knowledge contribution from a distance, a few major conclusions have been identified within the research with potential impact on research and management of IS integration in M&A.

12.2.1 Dynamic and systemic properties

The first major conclusion is the noticeable clear dynamic and systemic properties that can be found within the relationship between IS

integration and M&A. If changing any one property of either dimension, this leads to changes in most other dimensions immediately. In the cases one can discern some trend patterns, some kind of configuration of properties that match. One can talk of this as "profiles." For example, in the Kléber case the change to a more collaborative approach highly influenced both IS related and non-related integration work. It led to a symbiosis rather than absorption, to an altered IS integration focus with regard to IS functionality, and subsequently to a different view of integration architecture. The conclusion is that the one who is setting the agenda for the integration work highly affects which decisions are made, which integration aspects are favored, and which priorities are made.

In the CRP case the choice of only striving for integration in Infrastructural IS turned out to be decisive for many other aspects. This kind of integration turned out to be mainly technological. The infological or organizational level was not affected. Considering that the M&A processes are taking place on a mainly organizational level, it should only be when IS integration touches this level that the M&A context has significant implications for the IS integration work.

12.2.2 Understanding the link to business

The need to understand IS integrations' link to the business of the organization is one major conclusion that can be drawn from this study. This finding can be traced from several different sources. Already in the review of IS management tasks in chapter 2, it was put forward that one of the most prominent managerial tasks was to relate IS to business. By scrutinizing IS integration, it was argued that a parallel could be drawn stating the objective of IS integration to organizational integration. To understand organizational integration, it was necessary to return to the business of the organization and how organizational integration could contribute to enhancing it. For IS integration in M&A, it is essential to understand why the organizations engage in the consolidation and what they expect to get out of their engagement.

The most obvious statement of what the companies' want from the deal are those synergies that are communicated to the stock exchange market through press releases. These benefits seem to be more or less obsessions, since failing to leverage would render severe punishment from the stock market (Mehta & Hirschheim, 2007).

12.2.3 Developing an IS integration capability

The third major conclusion came from the insight that there was a clear mismatch between the way academics suggest that IS integration should be addressed proactively in the sense of inclusion into the due diligence and even deciding on M&As based on similarities in IS. Proactive use of IS integration means a focus on which measures companies can take prior to closing an M&A deal to ensure that a minimum of resources and time is used to achieve the desired IS integration. The concept has gained importance since several studies have pinpointed the significant problems frequently followed by ignorance until after the deal is closed. However, currently the theoretical suggestions have very little conformity with reality. Companies actively refute the suggestions produced by the research community in that IS integration matching should be a vital part of the due diligence. In this study we have added a long term perspective on IS integration in M&A that until now has been lacking.

The current view of the concept includes a positioning towards the reactive use of IS integration in most M&A processes. The proposition that IS integration has to be given more attention is enforced by surveys finding IS integration often becoming a costly and problematic part of the M&A. Against the advice of including IS match in the due diligence phase (Giacomazzi et al., 1997; McKiernan & Merali, 1995; Weber & Pliskin, 1996), companies still to a large extent actively refute the task. To overcome this mismatch of theory and practice, we suggest an extension and somewhat redefinition of the concept of proactive use of IS integration in M&A. Leaving the IS integration issues completely to post-M&A apparently causes problems. To tackle this issue, companies can include IS integration aspects prior to the deal, trying to estimate resources and time needed for IS integration in the due diligence phase. Based on theories from closely related research topics and our findings in the four case studies, we argue that the most important proactive measures that can be taken are taken well before the M&A starts in the improvement of preconditions for IS integration. In our empirical data, the complexity of IS integration was primarily decided by a) the installed base and its extensibility and b) the knowledge and skills among employees primarily gained in previous M&As. Together we call these two determinators the IS integration capability. We also argue that proactive use of IS integration in M&A should include not only the activity of estimating matching in the due

diligence preceding an M&A, but also actions taken to improve the IS integration capability with a long term perspective. In our cases, which are also in conformity with theories of Information Infrastructures and the general conception of how modern companies handle these issues, we find the latter activity being significantly more important to the resources and time needed to achieve the desired IS integration in M&A.

12.2.4 Synergies will set the agenda

The four cases-studies presented fairly different stories of IS integration in M&A. Ambition and demand ranging from complete integration into one single system (the Kléber and Chase-Walton cases) to loosely coupled bonding between existing systems (the CRP case). The four cases depicted IS integration that could have taken up to 10 years and IS but was completed in a couple of months. The cases also showed differences in management styles, integration techniques, involved parts, desired level of integration, and so on. In one aspect, however, the four cases were very similar. They all presented processes that from the top to bottom were permeated by the synergies that originally motivated the deal. Whether few or comprehensive, all major decisions that followed during the course could in some way be related back to the fundamental drivers behind the M&A and the desired outcome. When discussing this finding to some extent formally in relation to the evaluation of design propositions, but foremost informally before and after meetings, a general consensus could be reached upon the importance of never losing sight of the general objectives of the initiative. Integration success could be reached in a technical sense, without reaching success in a business sense. The strived for synergies will, and shall, set the agenda for IS integration in M&A, it was generally agreed upon. However, some senior IS professionals put up a warning flag for letting the synergies become an obsession. As explained by, for example, Lubatkin already in 1983, and to some degree even by the National Industry Conference Board in the 1920's (NICB, 1929), it is difficult to estimate synergies in advance. Some synergies might be illusionary, and the estimation process could be influenced by normal human constraints such as cognitive limitations, wishful thinking, and personal agendas.

12.2.5 Extending or Integrating

If scrutinizing the alternatives of how to actually implement IS integration closely, once again it is possible to make a distinction between two principal approaches. One is extending the existing system, encasing one unit within the realm of the other. In this way full integration is reached without actually creating any new bonds in a formal sense. On the other hand, there is the option of keeping the existing IS in place, trying to relate them to each other via point-to-point, middleware, or SOA technology. Upsides and downsides of the different alternatives have been addressed throughout the whole thesis and there is no way of giving a complete account for them in this space, but regarding the alternatives in this way, the two categories depict something that can almost be seen as two distinct paradigms of IS integration in the context of M&A. One relates to standardized process, centralized IS, and a homogenous IS structure. The core task related to M&A is keeping this machine effective and well-oiled. It demands a proactive approach to IS integration in M&A in that the existing system should be extendable. Core competence naturally includes change management since integrating another units means replacing their IS, thus their old way of working, handling of human reaction and good awareness of the existing system and its limitations. You cannot buy a company if your system cannot cover its processes and activities. Trelleborg Sealing Solution employs this strategy, an example outside Trelleborg sphere is Mexican Cemex, the world's third largest cement maker. Cemex has gained a reputation as a skilled acquirer that uses its custom made enterprise-wide IS to enforce its standardized procedures to integrate the acquired unit (Miller, 2002).

The alternative to expanding a core system like TSS and Cemex is the alternative of preserving the two IS units and relate them via some kind of interface. It assumes a decentralized structure with non-standard processes and integration almost in an ad-hoc manner. In the cases indicators could be found which related the interface approach to reactive use of IS integration. The decency goes both ways round: not considering IS integration before the M&A limited the possibility for using one enterprise-wide system for integration; on the other hand, if a heterogeneous "best of breed" architecture actually is the desired outcome or the changes required when assuming an extension-approach was regarded too cumbersome, then the reactive approach would be natural. The positive effects of the interface alternative is the limited

need for changes; the negative is the limited savings due to scale advantages and experience.

12.2.6 Some developments partly reset improvement and learning

What was found when applying the organizational learning perspective on the four cases and discussed in 9.2 was that some conditions act as barriers for the learning processes related to IS integration in M&A. First, there was the problem of knowledge walking out of the building since many of the skills and much of the knowledge necessary for IS integration in M&A was hard to externalize. Second, there was the opinion that no M&A is alike any other, as discussed in Chapter 3. The four cases indeed present different stories, but there were also some similarities and likely generality in, for example, that target activities could be divided into functional and operational, different degrees of dependencies, and different types of synergies striven for. However, the changing context for IS integration when M&A is the context should decelerate improvement from time to time. Third, not only the context of the IS integration is changing. For IS development projects in general, it has been found that a substantial part of the poor performance of these projects can be explained by the fact that technological innovation means that further development always starts from a new condition. In short, this means that once new technology is installed, organizational learning is reset (Bannermann, 2004). A similar position can be taken for IS integration in M&A. If engaging in an M&A every five years, for example, technological innovation would imply that it is never the same system that is integrated twice. When suggested that technological innovation resets learning, as a part of the design theory developed in the third part of the thesis, the IS professionals generally disagreed, arguing it was only part of the skills and knowledge that were related to one specific technology. Much more important was knowledge of processes, understanding the organization, being able to foresee which decisions would have to be taken (not necessarily the outcome of the decision), and having similar experiences related to the IS integration but not directly to the technology.

12.2.7 IS design science can be used to develop support for IS professionals facing IS integration in M&A.

IS design science is a new and not entirely uncontroversial direction of IS research. The down-side of writing a thesis based on a new and at least not entirely accepted research approach is, as explained, not only the need for comprehensive argumentation in favor of the approach, but also the limited methodological support available for the researcher. The upside is that the thesis methodologically can be found in the frontline of IS research, trying to develop the IS field in a prosperous direction. As explained in Chapter 11, the IS professionals had different opinions regarding the usefulness of the suggested propositions. However, on the question whether they could see themselves using some parts of the propositions in their professional life, all evaluators agreed in the positive. Some even immediately explained how they were planning to use the knowledge in the very near future.

The conclusion is thus that it is possible to develop practical useful knowledge on IS use and management by IS design science. More precisely, it is possible to develop such knowledge by the use of the method for IS design science applied in this thesis. This should be a valuable conclusion for the researcher who wants to do IS design research since very little methodological support currently exists.

12.3 Quality attributes of this research

"Relevance, rigor and results are the trifecta of academic research" (March, 2006). Thus far, the chapter has addressed the results of the research as contributions and conclusions. Relevance and rigor of the research has been touched upon several times during the thesis, for example, in the problem definition and in the construction of research designs for providing contribution towards the dual purpose of the thesis. As a part of the argument why to take notice of the contributions just presented above, this section summarizes measures taken to ensure rigor in the process leading up to the contribution and measures taken to ensure that contributions are relevant for both academic and practice. Rigor is represented by the five evaluation criteria for qualitative research developing explanatory theory (Gregor, 2006; Guba & Lincoln, 1994), presented in Section 5.6.

12.3.1 Research rigor

In Chapter 5 it was concluded that the rigor of research presented in this thesis should be evaluated by five five criteria: *Credibility, Transferability, Dependability, Confirmability,* and *Novelty* (see Section 5.6).

Credibility is built up through prolonged engagement in the field, as well as the persistent observation and triangulation of data. It has been instantiated by combining multiple sources of data to triangulate findings. The iterative research process with preliminary analysis throughout the process has been an effective way of isolating key issues that could be further researched using multiple data sources, including having the view from additional interview persons but also additional types of sources, such as documentation or observation. Especially in the Kléber case which took place some time ago, it was regarded essential to have multiple sources as the methodological literature with respect to the design of the research suggested that retrospective data could be biased and views somewhat fabricated after the fact.

Transferability was sought by trying to provide the readers with enough information for them to judge the applicability of the findings to other settings. The common context of Trelleborg was presented as to understand in which setting the cases were taking place. Efforts were also made to explain the general characteristics of the companies involved in the M&A.

To sustain a high level of dependability, the study's purpose and desired research contributions have been stated as clear as possible, basic paradigms and analytical constructs have been defined and explained, and the methods used that should preserve the contextual links of data. That colleagues, supervisors, Trelleborg representatives and students have been involved in various parts of the research should limit the risk of the researchers own biases shadowing potential research findings.

The strategy of continuously evaluating contributions throughout the research process has been a way of increasing the confirmability of the research. Initial literature studies were compared with the ones of fellow researchers which their Master's students were using, evaluating the preliminary theoretical framework for which the framework was evaluated based on predefined quality criteria, developed propositions in the design research process were evaluated by practice, and finally, quality attributes of the whole research process are evaluated here. It has

thus been a continuous ongoing auditing process to deem and improve the confirmability of the research made.

The literature review in Chapters 2-4 are the foundation for the research to contribute with novel understanding. By investigating and later elaborating upon the previous research made in the field. it should be possible to introduce novelty. Two additional arguments can be made in favor of this research presenting novel and interesting insight. First, parts of this thesis have been published in conference proceedings, book chapters, and scientific journals. The research has been peer reviewed and deemed novel and interesting by fellow researchers. Second, several of the evaluators of the design propositions explained that they were keen on using the propositions in practice. It is thus a novel contribution not only to the research community but also to IS professionals with comprehensive experience from IS integration in M&A.

A few final words need to be said about the generalizability of the findings beyond the specific cases. To say that Trelleborg which is an industrial group with manufacturing still being its core activity (perhaps with exception for the TSS division) and not having influenced the contributions presented above would be untrue. As discussed when evaluating the design propositions in the last chapter, some of the propositions were argued by the evaluators to be primarily suited for the manufacturing industry in the shape in which they were presented. "Don't boil the ocean," a senior integration specialist expressed it. With this he meant that the last model was suitable for the manufacturing industry, but in the example of a bank utility, dependent and enabling would be determined by different factors than for the manufacturing industry. The DySIIM model and its relations, as well as the design proposition, are argued depicting general mechanisms that should be valid even outside of the manufacturing industry. However, the mechanisms are, as described, dependent on specific conditions, for example, some synergies sought or some organizational structure being the context. If as in the banking industry no synergies in production, logistics, etc., can be achieved, the mechanisms related to these synergies are naturally not applicable to the banking industry. The mechanisms as such have been generalized towards theoretical patterns that are unevenly frequently recurring in different industries. Presenting reflections of the gained understanding to informed practitioners also addresses the issue of the validity of the findings beyond the

investigated cases, as the evaluation rendered access to a collective experience of numerous cases of IS integration in M&A.

12.3.2 Research relevance

The whole research process has been permeated by the idea of delivering contribution with significant relevance for both academia and practice. Being a "serious relevance and utilization problem" or not, IS research can be argued as having focused research rigor at the expense of research relevance (Hevner et al., 2004; Iivari, 2007; Venable, 2006). The ambition in this research has been to maintain research rigor, as explained above, while taking research relevance seriously. The research setup already from the beginning included close cooperation with Trelleborg AB which was a move to assure relevance in the study. The research was funded by Trelleborg whose willingness to provide sufficient funding for the research should guarantee research relevance for at least one company. Trelleborg has through its representatives been involved throughout the research process and contributed towards problem definition, research design, selection of case companies, and evaluation of the findings during the course.

Both the relations between dimensions and the design propositions are some kind of generic mechanisms that are dependent on specific variables for their effectuation. For example, it was stated that synergies in production were hard to leverage unless adopting an enterprise-wide system. The relevance of that mechanism is thus dependent on that the consolidating organizations have production at all, not all organizations do. In some sense, relations and design propositions reflects the universe of Trelleborg and although the relations and propositions has been developed to assume a generic character their relevance lies in the existence of the problems they address. These problems were initially problems perceived by Trelleborg.

The problem of Trelleborg can be argued in many ways to be valid for other companies. By assessing the importance of M&A on a global scene and by investigations of how IS integration in M&A was perceived by consultants and IS professionals, it was secured that it was a real world problem with significance for business that was addressed in the study. With the introduction of the design science methodology and the objective of creating prescriptive knowledge that could be used by IS professionals in their work, the relevance for business is taken

seriously. The contribution in the form of design propositions was also evaluated by IS professionals based on the relevance for them and their job.

From an academic point of view, it should be acknowledged that IS integration in M&A is an important empirical phenomenon of which little is known as yet. A profound investigation of existing research on the topic, summarized in Figure 4.1, made sure that this research could be built upon in order to extend the existing contributions. To the extent possible, existing vocabulary and notions have been used not to increase the already cumbersome terminological confusion within the field. Academic relevance has also been addressed by participation in several international conferences where the acceptance of peer researchers assures that the research is a relevant contribution to the research society. Exposing the research by publishing parts of the study at conferences has also helped to direct subsequent research activities into the most relevant directions.

12.3.3 Reflection on applied methods and the theoretical frame

With the results in hand, the question remains how appropriate the chosen methods and theoretical perspectives actually were. The easy and pragmatic answer to this question responds that a number of major and minor conclusions and contributions that arguably are relevant for both academia and practice have been produced in this research. From this point of view the research approach has been effective in its outset. The more gradated answer is that the approach has been better in targeting some parts of IS integration in M&A than others.

First, as noticed already in Chapter 9 when evaluating the individual dimensions of the framework, there was only limited data available to assess Dimension C: Intentions & Reactions. The research approach seems to have been more suitable for generating empirical data for example Dimension A: Synergetic potential. This data was more easily accessible, a few key managers who could easily be identified on organizational charts knew the expected synergies by heart, and additionally, synergies were recurring in due diligence reports, meeting protocols and other documentation. If five managers were to be asked, they would most likely repeat exactly the same synergies (although potentially disagree on the possibility of leveraging

the synergies in reality). This knowledge can thus be seen as some kind of holographic knowledge. A large amount of consensus existed on which synergies the company sought, even though not everyone agreed that they should search for these synergies.

On the other hand, the reaction of employees cannot be summarized into the reaction of one employee. You get somewhere by trying to see the employees as a group, with attributes such as turnover and protest meeting as indications as the groups reaction, but intentions and reactions are by nature far more subjective than synergies. To actually reach profoundly into these areas, it would probably have taken an ethnographically inspired study with the researcher being a part of the organization (actually, a part of both organizations) during the M&A process. Such an effort would have fallen outside the scope of the research, but it would certainly be an interesting path to follow in the future.

As explained in Chapter 5, the theoretical framework has evolved from an existing base through recurrent empirical and theoretical input. In accordance with the evaluation criteria of simplicity, inclusion of theoretical contributions into the framework has been restricted. One aspect that has been included and excluded a number of times is the cultural aspect. Organizational culture was put forward as an important part of organizational integration (see Chapter 3). It has been suggested that dissimilarities in organizational culture could be an important barrier for organizational integration. Culture has thus been an issue of study in all case studies, but was finally omitted from the framework for two reasons. As a subcategory to Dimension B: Organizational Integration, it was theoretically limited. The cultural aspect had to be limited to similar vs dissimilar, or something comparable. It was perceived that such a simplification was far beyond what was reasonable, using the theories in such a diluted way did not lead to useful conclusions. The aspect became too imprecise and became everything and nothing during the analysis. It can be seen as a weakness of the study that the cultural aspects could not be included into the theoretical framework, but it can also been seen as a strength of the evaluation of the research findings that this limitation was discovered and the cultural aspect omitted in the end.

Apart from culture, there are, of course, several other theoretical viewpoints and aspects of IS integration that have come into question for inclusion into the theoretical framework. The individual cognitive

dimension of both managers and employees is one example, but the decision was made to stay on an organizational level just to have a limit to the framework. Somewhere the study had to end, and the cognitive processes of individuals would have required a completely different research approach. Overall, the study had a somewhat simplistic view of the rationality of organizational processes. As explained, issues such as human reaction, culture, politics, and power have not been ignored, but neither have they been the main focus of the study. It is, of course, desirable that IS research continues to study these aspects of IS integration in M&A, and it is believed that the research contributions in this thesis consist of a good starting point to contrast future studies, as well as provide a guide for where to search for interesting data for these topics.

12.4 The future of IS integration in M&A

That IS integration in M&A is a subject for a doctorial thesis work is the result of a number of contributing trends in contemporary business life. The development in IT and software has led to a significant computerization of business life. Today, it is hard to imagine most business processes being carried out without any technological support. The technological inventions are the foundation of the IT based IS that imbue contemporary, and most certainly also future, business life. In addition, the global trend of increased M&A activity with a supplementary divestment trend forces companies to rethink their IS strategies and adapt to a rapidly evolving context for information infrastructure. As technological developments in enterprise systems affected the integration approaches during the 90's, it is more than likely that future development will have significant impact on how companies are fulfilling their needs of integrated information flows.

12.4.1 Technological development

A number of trends related to IS integration in M&A are worth noting. First is the development of different types of process standards. Process standards are developed in different industries. One example is the work of the Supply-Chain Council, developing the Supply-Chain Operations Reference (SCOR) model. SCOR "lays out a top-level

supply chain process in five key steps: plan, source, make, deliver, and return." (Davenport, 2005, p. 104). The ERP-company SAP has begun to include SCOR flows and metrics in its supply chain software packages. Another approach is The MIT Process Handbook Project (Malone et al., 2003) which involved collecting examples of how organizations perform similar processes. The processes' on-line repository includes knowledge of over 5000 business processes and activities, as well as tools, to edit and view this knowledge repository (http://ccs.mit.edu/ph/). The Handbook has been used by, for example, Dow Corning Corporation in a major SAP implementation and project supply chain management project (Phios, 1999). Yet another approach is the enterprise engineering/integration and the framework Generalized Enterprise Reference Architecture and Methodology (GERAM), which is a generalized framework for describing the components needed in all types of enterprise engineering and enterprise integration processes (Bernus et al., 2003; see, also, http://www.cit.gu.edu.au/~bernus/taskforce/geram/versions/). These three examples and similar approaches of development of process knowledge and standards are likely to make IS integration easier.

Another trend that will affect IS integration in M&A, as well as IS integration in general, is the development and increased use of Web services and SOA. SOA has the potential of drastically altering the condition for constructing corporate information infrastructures, but the use of the technology is still limited which makes it hard to see any long term consequences of SOA use (Henningsson et al., 2007). Other trends with potentially far reaching implications are EAI and ESB.

The above developments, as well as other developments, will from a technical view, make integration and de-integration easier to accomplish and also make new integrations possible. Still, the managerial issues in the presented framework will be the same.

12.4.2 Future development on findings and conclusions

As discussed above, it is an indisputable fact that the founding empirical data for the DySIIM model and consequently also for the design propositions, originates from the manufacturing industry. Two apparent extensions of the research thus are a) investigation of the recurrence of the findings produced in this research in other industries, and b) probing whether the generalized mechanisms that constitute the

DySIIM model and the design propositions are equally valid for other types of businesses. The approach towards previous research in constructing the theoretical framework was inclusive, rather than exclusive, which meant that some simplifications were made in the evaluation since some theory was found to give only limited help in describing and explaining the cases. Despite the inclusive approach, the iterativeness between empirical and theoretical input that was essential to identify theory able to construct the DySIIM model could have directed the theory search in a way that it overlooked theory to explain other types of cases.

In the DySIIM model the relations among the entities are yet ungraded in terms of occurrence and impact. As for future research, the statistical generalization of the relations would need to be investigated. Some relations could turn out to be stronger than others, and some relations could recur more often than others. Statistical analyses could also reveal if there were any combinations between attributes that were "better" than others. As a system, changes in one attribute trigger changes in other attributes which, in turn, trigger new changes, and so on. These cascading effects and the equilibrium that are (potentially) finally reached are further developments that would improve our understanding of IS integration management in M&A. It is possible to discern certain themes in the current material, such as, a "replace it all"-strategy in the CRP case and "preserve flexibility" in the Dynaflex case. There is a potential in developing these themes to some kind of IS integration profile, that is, a type of archetype of IS integration in M&A, that shares a great deal of characteristics and could be used by IS professionals as tools on a strategic level.

When evaluating the framework after using it in the four case studies, it was concluded that the harvested empirical data did say very little about one dimension, Dimension C: Intentions and Reactions. The research method was found unsuitable for investigating how people reacted to the M&A, related to IS integration and how it affected the IS integration. More appropriately, the kind of data required to fully explore this dimension could probably only be collected through ethnographically inspired field studies with a close relationship to the investigated object.

In the design science-phase of the study, three managerial challenges were chosen which were argued to be important, and for which there was sufficient theory to constitute a theoretical core.

Regarding IS integration in M&A, several other challenges remain for which scientifically grounded support needs to be developed and tested. In addition to the new challenges that have to be addressed, the existing design theories developed in this thesis can only be labeled "initial," meaning that they too need further testing and refinement before being taken into full scale use.

The support is currently expressed as design theories with a set of guiding principles. In an extension it is possible to imagine some kind of handbook for IS integration in the context of M&A. Such a book is lacking in the plethora of writings on IS development. Actually, any book on management of IS integration is lacking as far as it is known. This researcher's experience is that the existing literature on IS development, and thus in prolongation also the education carried out on universities and other higher institutions, is almost uniquely focused on development and implementation of entire IS from scratch. This is often the case for organizations that are assumed to not have used any IT based IS before. The work during this thesis project has revealed a severe mismatch between such education and what IS professionals actually are doing in their professional lives. The daily life of the IS professionals this reseacher has met in the course of developing this thesis is centered around maintenance, modifications, upgrades, extensions and integration of already existing systems. Building systems from scratch is something many of them never have, and never will, experience. In order to increase the relevance of this discipline and develop knowledge that can also be used by IS professionals in their professional life, it is argued that we should take the existing tasks and duties of the IS professionals as starting point for future research. In such research it is possible to provide them with scientifically grounded, trustworthy support for doing their job.

At the time of writing this document, I am together with some of the IS professionals that participated in the evaluation planning of some actual use in real world cases. The eagerness of some of the most experienced IS integration professionals to take the contribution of this thesis into almost instant use is, on a personal note, the best evidence that the work has resulted in contributions that in a trustworthy manner address a timely and complex problem for which no solutions previously existed.

Appendix A – Publications on IS in M&A

1. (Buck-Lew et al., 1992)
Title: "Accounting for Information Technology in Corporate Acquisitions"
Publication: Information & Management
Comment: The proposal is made that IT fit should be explicitly considered in analysis of corporate acquisitions. An assessment of IT fit will refer to the IT environments of the 2 joining firms, the IT contribution each firm can bring to the combined firm, and the role that IT should play both in negotiating the acquisition price and in integrating the joining firms.

2. (Merali & McKiernan, 1993)
Title: "The strategic positioning of information systems in post-acquisition management."
Publication: Journal of Strategic Information Systems
Comment: Puts forward the importance of IS issues in post-acquisition management.

3. (McKiernan & Merali, 1995)
Title: "Integrating information systems after a merger"
Publication: Journal/Long Range Planning
Comment: Argues that one can use IS proactively or reactively. Although most companies recognizes the importance of IS they seldom involves them in the planning process.

4. (Stylianou et al., 1996)
Title: "Corporate mergers and the problem of IS integration"
Publication: Journal/Information & Management
Comment: Suggest a variance model explaining what leads to IS integration success and test the model with a questionnaire.

5. (Weber & Pliskin, 1996)
Title: "Effects of information systems integration and organizational culture on a firm's effectiveness"
Publication: Journal/Information and Management
Comment: Studies the relationship between IS integration in mergers and a company's effectiveness.

6. (Giacomazzi et al., 1997)

Title: "Information systems integration in mergers and acquisitions: A normative model"
Publication: Journal/Information & Management
Comment: Construct a decision support model for IS integration in relation to mergers. Focus on IS integration strategies; what is and what should be deciding what should be integrated and to which extent.

7. (Robbins & Stylianou, 1999)

Title: "Post-merger systems integration: the impact on IS capabilities"
Publication: Journal/Information & Management
Comment: Revise the model of Stylianou et al (1996). Suggest new dimensions and new variables. Test the refined model.

8. (Chandra & Kumar, 2001)

Title: "IS integration success in mergers & acquisitions: measures, influencing factors, and models"
Publication: Conference/ASAC 2002
Comment: Builds on Stylianou & Robbins and applies a process perspective to further refine the variables

9. (Gurjar et al., 2002)

Title: “Impact of Information Systems Implementations on Vertical Mergers and Acquisitions: A Framework”
Publication: Proceedings from the inSITE conference, 2002.
Comment: Attempts to develop a conceptual framework for evaluating the impact of Information systems implementations on Mergers and Acquisitions

10. (Alaranta & Parvinen, 2004)

Title: "Contribution of Governance Theories of the Firm to the Analysis of M&A and Post-Merger Integration of the Information Systems"
Publication: Conference paper from IRIS’27
Comment: Relates Governance Theories of the Firm to integration.

11. (Hwang 2004)

Title: “Integrating Enterprise systems in mergers and acquisitions”
Publication: Proceeding of the Tenth Americas Conference on Information Systems
Comment: Research review

12. (Mehta & Hirschheim, 2004)

Title: "A Framework for Assessing IT Integration Decision-Making in Mergers and Acquisitions"
Publication: 37th Hawaii International Conference on System Sciences

Comment: Study which IS-related decisions that are made after a merger and what provoke them. Use three lenses: the Wall Street effect, organizational power differentials, and business-it strategic alignment.

13. (Alaranta, 2005a)
Title: "Evaluating Success in Post-Merger IS Integration: A Case Study."
Publication: Electronic Journal of Information Systems Evaluation (EJISE)/12th European Conference on Information Technology Evaluation, Turku, Finland.
Comment: Extends a framework for IS Success to IS in M&A.

14. (Alaranta, 2005c)
Title: "Integrating the Enterprise Systems after a Merger: Managing the Change in a Manufacturing Company"
Publication: Thirteenth European Conference on Information Systems, Regensburg, Germany.
Comment: Extends theories for ERP-implementations

15. (Henningsson, 2006a)
Title: "Managing Enterprise Systems Integration in Corporate Mergers and Acquisitions - A Tentative Framework and the Case of TIH"
Publication: IBIMA'05, Cairo, Egypt.
Comment: Addresses managerial aspects of ES integration in M&A and integrates prior research to a framework for studying the phenomenon.

16. (Henningsson, 2006b)
Title: "The Role of IS in corporate M&A - An Examination of IS Research Based on an Integrative Model for M&A Research."
Publication: ICFAI Journal of Mergers & Acquisitions (March 2006).
Comment: Theoretically addressing the contextual impact on IS integration in M&A.

17. (Brunetto, 2006)
Title: "Integrating Information Systems during mergers: Integration modes typology, prescribed vs constructed implementation process"
Publication: ECIS'06, Göteborg, Sweden.
Comment: Compares different approaches to IS integration strategy

18. (Henningsson & Carlsson, 2006b)
Title: "Governing and Managing Enterprise Systems Integration in Corporate M&A"
Publication: European Conference on Information Systems 2006, Gothemburg, Sweden.

Comment: Presents a framework for studying managerial aspects of ES integration in M&A and depects the frameworks utility with a case study.

19. (Wijnhoven et al., 2006)
Title: "Post-merger IT integration strategies: An IT alignment perspective."
Publication: The Journal of Strategic Information Systems 15(1): 5-28.
Comment: Address the question of IT integration from an alignment perspective

20. (Alaranta & Henningsson, 2007)
Title: "Shaping the Post-Merger Information Systems Integration Strategy"
Publication: 40th Hawaii International Conference on System Science, Waikoloa, Hawaii, US.
Comment: Focus on differences in the process of shaping post merger integration.

21. (Henningsson, 2007)
Title: "The Relation Between Is Integration And M&A As A Tool For Corporate Strategy"
Publication: 40th Hawaii International Conference on System Science, Waikoloa, Hawaii, US
Comment: Aims at assessing the fundamental mecansims to why and thus when IS integration becomes an critical issue in M&As.

22. (Mehta & Hirschheim, 2007)
Title: "Strategic Alignment in Mergers & Acquisitions: Theorizing IS Integration Decision Making"
Publication: Journal of the Association for Information Systems
Comment: Based on their previous article, studying strategic alignment through three different lenses

Appendix B - Acquisitions and Divestments by Trelleborg AB

Acquisitions 1991-2006 :

2006 Acquisition of Mehren Rubber A/S (oil/gas extraction equipment), acquisition of Kawneer Rubber and Plastics (polymer sealing products), acquisition of UAB Trella (protective suits), acquisition of Mar-Con Group (elastomer applications for the electronics and telecom sectors), acquisition of Harbour & Marine Engineering Pty Ltd (marine fender systems), acquisition of EPG Inc. (extruded profiles and pipe seals), acquisition of CRP Group (polymer systems and solutions for offshore oil and gas projects), acquisition of remaining 70 percent of Elastomer Compounding s.r.o. of the Czech Republic.

2005 Acquisition of the operations of Dunlop GRG Holdings Ltd. (products for protection and transport in demanding environments), acquisition of the operations of Andre Structural Bearings (bearings for infrastructure projects), acquisition of remaining 45 percent of Chinese subsidiary Wuxi Trelleborg Vibration Isolator Co Ltd, acquisition of the operations of Chase-Walton Elastomers Inc (precision aerospace seals), acquisition of Cimap Roues Industrielles SAS (industrial tire distribution), acquisition of the operations of Armwest Pty Ltd, Australia (rubber sheeting), acquisition of the sealing operations of Rollon Hydraulics Pvt. Ltd., India (special seals distribution), joint-venture agreement with Al Dobowi Ltd (distribution of tires, the Middle East), acquisition of operations within tunnel seals, acquisition of machine equipment and other assets within marine fenders.

2004 Acquisition of Metzeler Automotive Hose Systems (hose systems), acquisition of Dynaflex (speciality hose), acquisition of remaining 49 percent of Eika Corporation (distribution), acquisition of Batek (pipe seals), acquisition of the operations of Ecoboard (marine fender systems).

2003 Acquisition of Smiths Polymer Sealing Solutions (precision seals), acquisition of the operations of DJ Profiles (industrial profiles), acquisition of German industrial profiles company ETU GmbH, acquisition of AK Plast (automotive components), acquisition of Unifluid Technologies (speciality hose), acquisition of 51 percent of South Korean Kunhwa Co Ltd. (automotive components).

2002 Acquisition of Seaward International Inc (USA) (marine fender systems).

2001 Acquisition of Hercules Rubber & Chemicals (Singapore), Queensland Rubber (Australia) and Fentek Marine Systems (Germany) (marine fender systems). Acquisition of Danish company Phønix Tag (sealing systems for roofs).

2000 Integration of Invensys AVS with operations, making Trelleborg the world's leading manufacturer of antivibration components for vehicles. Acquisition of Laird Automotive Components.

1999 Acquisition of German company DiPro (sealing profiles). Trelleborg places bid for UK company Invensys' antivibration operations.

1998 Signing of joint venture agreement with Pirelli regarding radial tires for agricultural machinery, acquisition of SRG Bevco in the US (distribution of industrial supplies). German company ETM (sealing systems), Swedish company Trebolit (sealing systems for roofs), German DBV and Finnish Joule (distribution of rubber membranes).

1997 Acquisition of Yale-South Haven in the US/Mexico, PAV in Brazil (automotive components), Ibercaucho in Spain (woven products), Vorwerk in Germany and Sri Lanka (industrial tires), Wheelbond in South Africa (tire distribution) and Park Rubber in the UK (sealing systems).

1996 Acquisition of French company CMPP (industrial hose), Swedish company Horda (sealing profiles, automotive components and cable composites), Prelasti in Belgium (sealings and rubber membranes), and Snowden-Anderson in the US/Canada (distribution of industrial supplies)

1995 Collaboration agreement signed with Yale-South Haven in the US (automotive components). Sales offices opened in Japan, Brazil, Poland the Czech Republic and Hungary.

1994 Expansion of international sales organization. Sales offices opened in Singapore, Malaysia, the Philippines and Hong Kong.

1993 Acquisition of Hadsten Wheels in Denmark (production of wheel rims)

1992 Acquisition of Rubore in Sweden (development and manufacture of sound-absorbing inserts for the automotive industry)

1991 Acquisition of Monarch Tires in the US

Divestments since 1999

2006 Divestment of Goodall Rubber Company

2004 Divestment of the remaining holding (49 percent) in the Trenor Group (Ahlsell, Bröderna Edstrand, Reynolds).

2002 Divestment of metal-recovery company Metech; divestment of molded goods operations in Trelleborg Industries UK.

2001 Sale of operations in roll-coverings area.

2000 Trenor divested Starkki; divestment of manufacturing units in Horda and Ohs.

1999 The remaining holding of ordinary shares in Boliden Ltd was distributed to shareholders; divestment of operations in Skoogs Elektrogrosshandel GmbH; divestment of operations in Chapman; sale of holding in BPA; stock-exchange listing of Sorb Industrier; divestment of Starckjohann Auto and Trelleborg NV.

Divestment of 51 percent of the Distribution Sector (Ahlsell, Bröderna Edstrand, Reynolds and Starckjohann). The jointly owned Trenor company was formed with the buyer Nordic Capital.

Source: Trelleborg AB website (www.trelleborg.com)

Appendix C – Interviews

Interview	*Medium*	*Date*
General interviews		
Peter Andersson	Live	041125
Peter Andersson	Live	050118
Peter Andersson	Phone	050420
Dan Eisengarthen	Phone	050426
Dan Eisengarthen	Live	050510
Case Kléber		
Alain Guillon	Phone	050608
Alain Guillon	Live	050714
Alain Guillon	Live	050714
Alain Guillon	Live	050715
Jacques Riviere	Live	050714
Jean-Cyril Mourier	Live	050714
Patric Pieret	Live	051019
Benjamin Mottaz	Live	061120
Case CRP		
Jan T. Pettersson	Tele	060320
Jan T. Pettersson	Live	060411
Jan T. Pettersson	Live	061107
Jan T. Pettersson	Live	071210
Lars E. Olsson	Tele	080404
Case Dynaflex		
Benjamin Mottaz	Tele	061113
Benjamin Mottaz	Live	061120
Allain Guillon	Live	050714
Allain Guillon	Live	061213
Jean-Cyril Mourrier	Live	050714
Jean-Cyril Mourrier	Tele	061215
Case Chase-Walton		
David Brown	Phone	061117
David Brown	Live	061207
Matthieu Dubreuq	Phone	061201
Matthieu Dubreuq	Live	061207
Alexander Jarosh	Phone	061110
Alexander Jarosh	Live	061207

Appendix D – General interview guide

Document information: This document contains a refinement of the conceptual research model into seven investigation themes. Together, the themes should cover all aspects of the conceptual model.

Developed: 2005-05-25

Investigation outline:

THEME GROUP A: M&A INTEGRATION

- THEME A1: ACQUISITION RATIONAL AND DESIRED INTEGRATION
- THEME A2: TARGET PERCEPTION OF ACQUISITION OF INITIATIVE.
- THEME A3: M&A INTEGRATION MANAGEMENT
- THEME A4: THE ACQUISITION AND INTEGRATION PROJECT.

THEME GROUP B: IS INTEGRATION

- THEME B1: EXISTING IS BEFORE ACQUISITION.
- THEME B2: IMPLEMENTED IS INTEGRATION AND PLANED IS INTEGRATION
- THEME B3: IS INTEGRATION MANAGEMENT

Theme Group A: M&A Integration

Theme A1: Acquisition rational and desired situation after the acquisition
Objective: Establish the integration objective behind the acquisition. This theme will try to capture the rational reasons behind the acquisition and what was the anticipated final outcome. What was the relation between the two units prior to the merger? Direct competitors, complementary? Which were the expected synergies that motivated the merger? How autonomic should the new unit become? Also, what might be even more important – how is the actual situation today? Has plans been accomplished as expected? Does employees feel like a part of the Trelleborg group?
What was the integration objective? *Who was deciding the objective? How was it decided? When? Settled at one point or evolved decision?*

Relation: (Horizontal, Market extension, Vertical Backward, Vertical Forward, Product Extension, Conglomerate)
What was the market relation before the acquisition?(Same, Long Linked, Unrelated)
What was the product relation before the acquisition?

Synergies:
Technical? (Marketing, Production, Experience, Scheduling, Banking, Compensation)
Pecuniary? (Monopoly, Monopsony)
Diversification? (Portfolio management, Risk reduction)

Desired level of integration: (absorption, preservation, symbiosis, and holding)
Strategic interdependence?
Organizational autonomy?

Theme A2: Target perception of acquisition initiative.

Objective: Map how the acquisition was perceived.

The second theme is directed towards the perception of acquired/merging parts. Were both the organizations positive to the merger? The employees? The syndicates? Was there any protests? Did people leave the organizations? How was the financial situation of the plants before? Were there any options to the merger?

What was the financial situation before the acquisition at CF? How was business going?

How was the relation to the Michelin group?

Future of CF "if not"?

How was the takeover perceived at CF?

Did the view change over time, for how long lasted initial perception?

Did people leave the company? Who? Levels?

Was anyone transferred to Trelleborg?

Was anyone transferred from Trelleborg to CF?

How much of THIS heritage CF resp T today? Was this the plan?

Was there any conflicts? Were the employees worried before the take over?

Was there other potential buyers? Which option was preferred?

Theme A3: M&A Integration Management
Objective: Describe who was managing and how Who was managing? During the acquisition and in near time? From where came project managers, first CEO? Who has been managing later projects? People from Trelleborg or Clermont-Ferrand? Has IS/IT been an general management issue? Which formal management means have been and are being used? (Project plans, checklists, evaluation forms etc) What are management praxis like? Culture, tradition? Also touching general change projects, such as business reengineering projects.
Who was managing? From Trelleborg? From Michelin? *By which means?* *Formal?* *Project plans?* *Checklists?* *Evaluation forms?* *Etc* *Nonformal?* *Cultural* *Praxis* *Tradition* *Top level or bottom up?* *Was IS a general management issue?*

Theme A4: The acquisition and integration project.
Objective: Describe the M&A integration context Which were the major events and activities during the integration? How did the project unfold? When did the integration start and when was it finished?
Timeline: When started the process? When was the organization integration terminated? *Who was in the project?* *Project plan? Milestones? Major events?* *Timeframe to completed integration?* *Do employees feel like a part of the Trelleborg Group?*

Theme Group B: IS integration

Theme B1: Existing IS before acquisition.
Objective: Depict the starting condition What did the IS/IT park look like before the acquisition? Which types of systems? How old? Did they work?
IS park: *Security?* *Information?* *Transaction?* *Infrastructure?* *Own taxomony?* *Production?* *Financial?* *HR?* *IT based vs manual?* *Age? Good systems?*

Theme B2: Implemented IS integration and planed IS integration
Objective: Describe how IS integration was implemented in practice *Which IS have been integrated? Why? How? Which technical solutions have been made? What have triggered these integration efforts? Can they be related to the acquisition or is it a too distant connection? Which information flows between the unit and the rest of the Trelleborg group? Economic figures? Strategy, visions, etc? Are there any future integration plans?*
Which IS have been integrated? Why? How? *Which solutions have been implemented? Technology?* *Point-to-pint* *Middleware* *Enterprise wide* *Which technical links are there to other Trelleborg department?* *Which information flows? Economic figures etc? Does T want more info?* *Future integration plans?*

Theme B3: IS Integration Management
Objective: Describe who was managing and how *Those IS/IT integration projects that has been carried out, how has they been managed and by who? This theme is somewhat similar to theme A3, but addresses specifically information integration projects.*
How has been deciding upon integration? *How has implemented plans? Been responsible? Unit, role, individual.* *Formal?* *Project plans?* *Checklists?* *Evaluation forms?* *Etc* *Nonformal?* *Cultural* *Praxis* *Tradition* *Top level or bottom up?* *Was/Is IS an general management issue?* *Is IS handled proactively or reactively? How was it handled in the project?*

Appendix E – Supporting management of IS integration in M&A

Proposals based upon a Ph.D. thesis at Department of Informatics, Lund University.
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Introduction

In 2004 Trelleborg AB and Lund University entered into a partnership with the ambition to conduct research on topics relevant to both the university and the business of Trelleborg AB. One of the topics agreed upon was information systems (IS) integration in the context of corporate Mergers and Acquisitions (M&A). At the end of 2007 four acquisitions made by Trelleborg during the last decade have been investigated with the ambition to describe and explain the relationship between IS integration and M&As. That is, how the specific context of M&A affects IS integration and vice versa, how and to which extent the M&A is dependent on IS integration to leverage its potential benefits.

The phenomena of M&A is continuously becoming more and more popular all over the world and the importance to understand the role of IS integration is not limited to Trelleborg AB. In the academic literature there is a distinct argument that IS integration issues are not given sufficient recognition in the M&A process. For example, only 16 % of companies have been found to address the potential costs and problems related to the IS integration before sealing and acquisition deal[3]. Consequently only some 40 % of 400 companies claimed that their last IS integration project in relation to an M&A was successful[4]. One of the major reasons why companies don't address IS integration prior to the deal is closed is simply because it lacks appropriate means to address these issues. The academic society has not been able to produce tools, guidelines, principles, models or frameworks that can be used to address IS integration in M&A. This text describes an attempt to provide support for management of IS integration in M&A based on the discoveries I have made in my research. It addresses three specific managerial challenges each related to a specific managerial problem.

The task

If you receive this document it is because you have agreed to, or potentially considering, participating in evaluating the below described propositions on how the addressed managerial challenges can be dealt with. The intended user of the propositions are IS professionals or managers that through their positions are given authority to make decisions regarding IS integration in M&A. They can thus be expected to have achieved related education and have experience from the field of IS management. Your role is to evaluate the proposition according to three conditions:

[3] Accenture (2002) "Getting information technology right is key to M&A successes", http://accenture.tekgroup.com/article_display.cfm?article_id=3871

[4] Accenture (2006) "Executives report that mergers and acquisitions fail to create adequate value", http://accenture.tekgroup.com/article_display.cfm?article_id=4364

a) **Importance**: do the prepositions address realworld problems in a timely manner, and in such a way that it can act as a starting point for providing an eventual solution? Put differently, is the problem an existing and significant problem four your (if any) organization and, to your knowledge, companies in general?
b) **Accessibility**: Are the propositions understandable, readable, and are their desired effects clear?
c) **Suitability**: Given the importance of the problem and the understanding of the propositions, does the proposition give suitable support, guidance, recommendations? Can you agree or disagree with the proposition based on your experience?

As you read this text we have most probably agreed upon a time for discussing your comments regarding the propositions. Before the meeting, I would be pleased if you can read through the challenges and the propositions on how they can be addressed. At the meeting I would like to direct the discussion into three parts. Firstly you will be asked about any general comments. Secondly we will discuss your comments regarding the three evaluation criteria mentioned above. Please give them a thought beforehand. If you don't exactly understand their meaning I will explain when we talk. Thirdly you will be asked of one specific case, real or imaginable, and how you would have used the proposals in that case (if you would, that is). Please try to think of such a case before we meet. The three managerial challenges and their related proposals can be found below.

Challenge 1: Improving the IS integration capability

M&A-related integration and disintegration has become a part of the everyday operations for companies with M&As as a part of their growth strategy. It is here argued that if, exactly as numerous contemporary business organizations currently does, one assumes an M&A-based growth strategy it is essential that each M&A is accompanied with organizational learning processes that enables performance enhancements in future M&As. The managerial challenge used as problem is thus how to improve from one M&A to the next. The questions to pose is whether it is possible to improve in the IS related issues, and if so, what can be improved?

The "IS integration capability' consist of two parts: how easy to integrate or extend the existing IT infrastructure it is and which knowledge and skills the staff has that can be used in IS integration. Improving this capability is thus essentially to a) improve the IT infrastructure and b) improve the knowledge and skills of the staff. There are of course several ways of doing this. Based on the study I can conclude four general propositions that suggest facilitating and hampering conditions for learning from one acquisition to another:

- **PI-1**: If the organizational structure is decentralized, this can lead to unconsciousness of previous, similar experiences of IS integration and M&A and also limit the ability to learn on a corporate level from project to project. In other words, *to achieve improvements from time to time, some special measures, such as cross organizational collaboration groups, standardization when possible, transfer of knowledgeable individuals, and mandatory evaluation and documentation, that ensure information spread from unit to unit and from unit to corporate level needs to be taken if the organization is decentralized*.

- **PI-2**: As M&A-related integration of IS is a result of external triggers rather than autonomy and willingness the processes are likely to provoke exploitive (to use existing solutions to deal with a problem) rather than explorative (to explore completely new knowledge) learning. *As the explorative learning normally is an important complement, it can be beneficial to by oneself engage in explorative learning of IS integration*.

- **PI-3**: Heterogeneous IS are hampering learning processes of IS integration as the knowledge gained after one acquisition on how to extend the system cannot be used in

the next if the system is different. Therefore *advantages of specific IS for one unit should be compared against the hampering effects on organizational learning. If no reason exist for a heterogeneous IS base, standardization in systems and processes are desirable*.

- **PI-4**: Since IS integration knowledge seems to be a hard to externalize, companies needs to be careful how this knowledge is spread within the company. If consultants are used, the knowledge normally walks out the door. *If the company frequently engage in M&As and needs to develop a strong IS integration capability, using internal IS professionals can enhance that capability.*

Challenge 2: Realizing potential synergies with IS integration

A frequent topic of debate is the importance of IS integration for the M&A act. Numerous academics have argued that IS integration not is given the necessary attention[5]. Still IS integration is reported being treated as a marginal issue in most M&As[6]. It is easy to imagine that the importance of IS integration is not equal in all M&As. For example, in merging banks of similar size and negotiation power IS integration would definitively be crucial to leverage the anticipated synergies. On the other hand, M&As are reported driven by reasons such as acquiring a specific technical solution or patent. In these cases IS integration logically might not have a role to fulfil. As the importance of IS integration fluctuates this heavily from case to case, there is a need of being able to roughly anticipate the importance IS integration is going to have for the leveraging of synergies. If the importance only is limited cognitive load and resources can be devoted to other aspects of the M&A. On the other hand, if some sort of IS integration-critical M&A can be defined this would constitute a support for managers and IS professional. The challenged addressed here is the task of determining the impact of IS integration for leveraging an M&A's expected synergies. Five general propositions can be made:

- **PII-1**: Some synergies generally requires more comprehensive IS integration than others for their leverage. Roughly speaking integration of a company's operational units is more complex and consumes more resources than integration of functional units, for example marketing, sales, management, and HR. *Consequently, if the company in the future would like to make M&As where synergetic effects are searched in production, logistics, or scheduling the company should assume a proactive strategy to IS integration in that the company develops the systems in an "extendable" way and make sure their employees have the right training to do this extension smoothly.* Otherwise the risk of failing to leverage synergetic effects is high.

- **PII-2**: The way modern companies are doing their business activities a to a large extent defined by how their supporting IS. Replacing an IS most often signify that the way employees carry out their work is changed, which naturally can lead to reactions among the employees. The synergies sought for in an M&A are determining which types of IS that need to be integrated, which in turns has effects on the importance of considering employee reaction. This is because only integration in Operational IS is likely to transform the way the integrated unit is doing business. *Therefore, if the synergies strived for affects operational IS, employee reaction should be given close attention (explanation, motivation) by the management as to avoid resistance among employees*.

- **PII-3**: As said above leverage of synergies in production, logistics, and scheduling are the ones who generally requires the most comprehensive IS integration. Of the

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

[6] Accenture (2002) "Getting information technology right is key to M&A successes", http://accenture.tekgroup.com/article_display.cfm?article_id=3871

architectural solutions available for IS integration (point-to-point, middleware, SOA, enterprise-wide, data warehouse) the enterprise-wide seems to be the one that complex integration. *Therefore, to the higher degree the companies in an M&A are expecting synergies in production, logistics and scheduling the higher chances for Enterprise-wide integration being the most appropriate option*.

- **PII-4**: As noticed synergies that only require integration of functional units do not require as complex bonds as operational integration. Therefore this integration can more easily be dealt with for example middleware that leaves the systems undisturbed and do not require organizational changes. *If synergies that only will require integration of functional units are sought, IS integration will become more of a technical rather than organizational change project. Since the effects of a technical project are easier to handle, less attention can be given when integration only is directed towards functional units.*

- **PII-5**: The importance of the individual IS being target for integration to the organizations should be assessed. Some activities are critically dependent on their supporting IS. *If activities where IS is in the higher levels of importance are being integrated, IS integration should be a prioritized issue during the pre-M&A investigations since changes or disturbance in the IS will severely affect that activity. If only activities with low levels of IS dependency are being integrated IS integration can be given less attention.*

Challenge 3: Choosing the IS integration architecture

Regardless whether a company assumes a proactive or reactive approach to IS integration in M&A and regardless of which synergies the act is supposed to enable, one managerial challenge that remain is to decide how the information systems actually should be integrated to appropriately support the objectives of the consolidation. The third, and last, managerial challenge approached is the matter of choosing the appropriate integration architecture for the information systems involved. The options are Point-to-point, Middleware, Service Oriented, Enterprise-wide and Data Warehouse – the approaches all have specific characteristics that lead to advantages and disadvantages in specific contexts.

The propositions on how to deal with the challenge of choosing an integration architecture will be presented as a matrix. One dimension consists of the desired integration after the M&A. Four alternatives exists: Holding (just own for future use, no integration), Preservation (preserve the unit but integrate marketing profile and provide transparency), Symbiosis (both participating units jointly and in agreement transforms into the merged organization), Absorption (an acquired unit is absorbed into the acquiring organization). On the other axis is the significance of IS to the unit being integrated, this ranges from None, through Utility, Dependent, and lastly Enabling. The suggestions on when to use the different architectural solutions are presented in the figure below.

- **Point-to-point:** Is seldom recommended. Potentially for temporary solutions or when the acquiring company wants to preserve the acquired unit without affecting its business. However, point-to-point integration rapidly becomes complex and most often a middleware is better lasting solution.

- **Middleware:** When the acquired units IS is of enabling (being critical to the units activities) it becomes difficult to change that IS. Therefore middleware integration is recommended. There is an obvious clash with the enterprise-wide architecture if the desired outcome is an absorption, since a complete absorption by definition cannot be conceived without using the same enterprise-wide IS. However, this only depicts a real world problem if one wants a complete absorption without disturbing the internal process of the acquired unit.

- **SOA:** Not included since no empirical studies exist of M&As were SOA was used. SOA can be seen more like a paradigm shift that replaces the other options, a paradigm shift that would be a longtime strategic concern and not an ad hoc integration decision.
- **Enterprise wide:** The enterprise-wide solution is the default solution when absorption is strived for. It can also be recommended for symbiosis when the importance of IS only is utility.
- **Data warehouse:** Not considered as a real integration solution, enables transparency but not the benefits of IS integration. Could thus be in question for holding and preservation M&As.

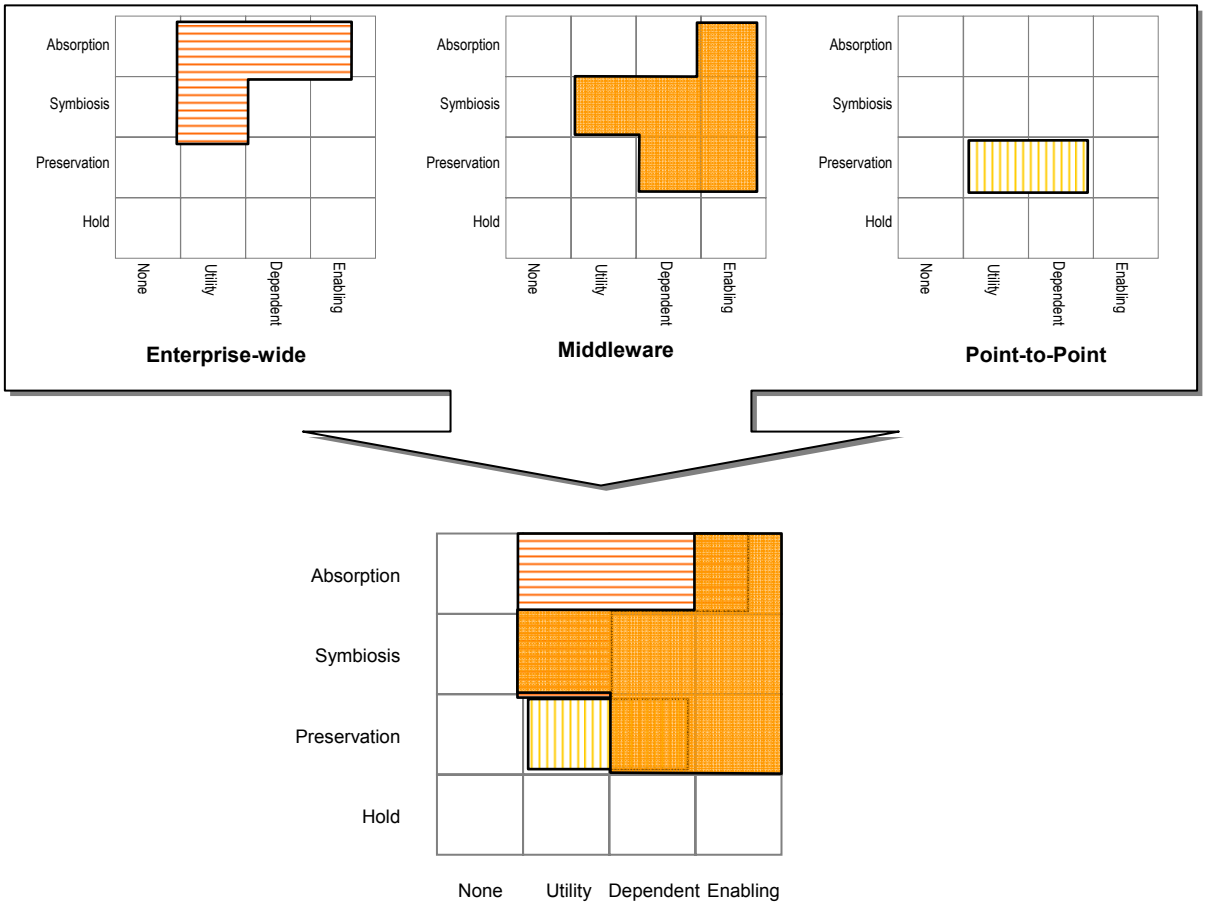

Figure: A model to guide selection of integration architecture in M&A

Appendix F – Guide for evaluation of management support

This document contains instructions for evaluating the design propositions suggested in document "Supporting management of information systems integration in corporate mergers and acquisitions". It includes the setup and specified evaluation tasks.

Setup

Contact:	Interview persons contacted via email or phone ahead.
Preparation:	Document "Supporting management of information systems integration in corporate mergers and acquisitions" sent to interview person a few days ahead of scheduled meeting. Document includes a) Introduction b) Task description with instructions for preparation c) Evaluation criteria d) Design propositions
Location:	Visit to interview persons, department of informatics or telephone (avoid if possible)
Documentation:	Recording, transcript of key sections
Output:	Completed evaluation form, "Evaluation form for design propositions"

Evaluation criteria

The evaluation criteria are derived from (Rosemann & Vessey, 2008)[7]:

[7] Rosemann, M. and Vessey, I. (2008) Toward improving the relevance of information systems research to practice: The role of applicability checks. *MIS Quarterly* 32 (1),

Importance	- controlled within the organization - focuses on a key management issue - addresses a real-world problem - timely
Accessibility	- understandable - readable - focuses on results rather than the research process
Suitability	- complete - provides guidance and/or direction - provides concrete recommendations

Evaluation procedure

The evaluation will be semistructured. I will go through three phases that all have pre-defined checkpoints, but nor formalized questions. Respondents will be encouraged to speak freely and make suggestions on improvements also on criteria not covered by the three evaluation criteria. The three phases:

Phase 1:	Open discussion and general comments. Any clarifications on the design propositions regarding purpose, interpretation, and understanding of the purpose of the evaluation.
Phase 2:	One by one the propositions (including the model) is addressed by the three evaluation criteria. The evaluation form is complemented. Just as importance as the mark-up is the motivations. These could possibly be completed afterwards since the evaluation is recorded.
Phase 3:	Respondents are asked to think of one real (if possible) case and describe how they would have used (if they would) in that specific case and if they should had made any difference.

Appendix G – Evaluation form

Date: _____

Place: _____

Moderator: _____

Evaluator: _____

Evaluator position: _____

Evaluator experience: _____

Phase 1

General comments: _____

_____

_____

_____

_____

_____

_____

Phase 2

For each of the propositions below estimate its *importance* (controlled within the organization, focuses on a key management issue, addresses a real-world problem, timely), *accessibility* (understandable, readable, focuses on results rather than the research process), and *suitability* (complete, provides guidance and/or direction, provides concrete recommendations).

Scale: 1-7, 1=Strongly disagree, 7=Completely agree

Challenge 1 _____

PI-1	1	2	3	4	5	6	7
Importance_____	☐	☐	☐	☐	☐	☐	☐
Accessibility _____	☐	☐	☐	☐	☐	☐	☐

Suitability _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Motivations: _____

_____

_____

_____

_____

_____

PI-2 1 2 3 4 5 6 7

Importance_____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Accessibility _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Suitability _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Motivations: _____

_____

_____

_____

_____

_____

PI-3 1 2 3 4 5 6 7

Importance_____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Accessibility _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Suitability _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Motivations: _____

_____

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_____

_____

_____

PI-4 1 2 3 4 5 6 7

Importance_____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Accessibility _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Suitability _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Motivations: _____

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Challenge 2 _____

PII-1 1 2 3 4 5 6 7

Importance_____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Accessibility _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Suitability _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Motivations: _____

_____

_____

_____

_____

_____

PII-2 1 2 3 4 5 6 7

Importance_____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Accessibility _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Suitability _____ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Motivations: _____

_____

_____

_____

_____

_____

PII-3	1	2	3	4	5	6	7
Importance_____	☐	☐	☐	☐	☐	☐	☐
Accessibility _____	☐	☐	☐	☐	☐	☐	☐
Suitability _____	☐	☐	☐	☐	☐	☐	☐

Motivations: _____

_____

_____

_____

_____

_____

PII-4	1	2	3	4	5	6	7
Importance_____	☐	☐	☐	☐	☐	☐	☐
Accessibility _____	☐	☐	☐	☐	☐	☐	☐
Suitability _____	☐	☐	☐	☐	☐	☐	☐

Motivations: _____

_____

_____

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PII-5	1	2	3	4	5	6	7
Importance_____	☐	☐	☐	☐	☐	☐	☐
Accessibility _____	☐	☐	☐	☐	☐	☐	☐
Suitability _____	☐	☐	☐	☐	☐	☐	☐

Motivations: _____

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Challenge 3 _____

Model	1	2	3	4	5	6	7
Importance_____	☐	☐	☐	☐	☐	☐	☐
Accessibility _____	☐	☐	☐	☐	☐	☐	☐
Suitability _____	☐	☐	☐	☐	☐	☐	☐

Motivations: _____

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Phase 3

Fill out the hypothetical use below

Propositions I1-I4: _____

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Propositions II1-II5: _____

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Propositions III: _____

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Additional comments: _____

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Appendix H – List of Evaluators

Senior IS Professionals

S1.
CIO at a diary companies with +20 years of integration experience. Regards his work to be "99% about various forms of integration", since governmental regulation has put pressure on traceability and security for the food industry. Expiriences from IS integration in several major and minor M&As.

S2.
Formerly chief architect and co-founder of a now multinational systems integrator, integrating systems worldwide with their internally developed applications and methodology for middleware-integration. Still associated and advisor to his prior employeer, but also private consultant and advisor in IS integration to several multinational companies.

S3.
CIO at one of Sweden's largest manufacturing companies, which yearly acquires a number of smaller and larger companies as part of their growth strategy. +30 years of experience from IT management.

S4.
Senior systems integrator at one of Sweden's largest manufacturing companies. Responsible for the management of more than 10 IS integration projects related to M&As.

Junior IS professionals

J1.
ERP consultant for Accenture. Graduated in 2007, with an awarded thesis on IS integration. Some experience of IS integration in M&A.

J2.
System developer at one of Sweden's largest manufacturing companies. A few years professional experience of system development, including some project management.

J3.
Education consultant at an EPR developer. Graduated with a thesis in IS integration. Profound knowledge on ERP systems and their life cycles, but limited experiences of IS integration in M&A.

Researchers

R1.
Gained in 2008 a Ph D in Information Systems for her thesis on IS integration in M&A. One of the three most published researchers on IS integration in M&A.

R2.
Swedish Ph D who gained his degree in 2007 with a thesis on M&As in the Swedish IT-industry. Has published extensively in the field of IS in M&A.

References

Accenture (2002) Getting information technology right is key to m&a successes. Accenture Reports.

Accenture (2006) Executives report that mergers and acquisitions fail to create adequate value. Accenture Reports. Retrieved 2006-11-11 from http://accenture.tekgroup.com/article_display.cfm?article_id=4364.

Adelberg, A. H. (1975) Management information systems and thier implications. *Management Accounting* 53 (9), 328-328.

Agarwal, R. and Lucas Jr, H. C. (2005) The information systems identity crisis: Focusing on highvisability and high-impact research. *MIS Quarterly* 29 (3), 381-398.

Aiello, R. and Watkins, M. (2000) The fine art of friendly acquisition. *Harvard Business Review*, 100-107.

Al-Mashari, M., Al-Mudimigh, A. and Zairi, M. (2003) Enterprise resource planning: A taxonomy of critical factors. *European Journal of Operational Research* 146 (2), 352-364.

Al Mosawi, A., Zhao, L. and Macaulay, L. (2006) A model driven architecture of enterprise application integration. In proceedings of *HICSS'39*.

Alaranta, M. (2005a) Evaluating success in post-merger is integration: A case study. *Electronic Journal of Information Systems Evaluation (EJISE)* 8 (3), 143-150.

Alaranta, M. (2005b) Evaluating success in post-merger is integration: A case study. In proceedings of *12th European Conference on Information Technology Evaluation*, Turku, Finland.

Alaranta, M. (2005c) Integrating the enterprise systems after a merger: Managing the change in a manufacturing company. In proceedings of *Thirteenth European Conference on Information Systems* (Bartmann, D. and Rajola, F. and Kallinikos, J. and Avison, D. and Winter, R. and Ein-Dor, P. and Becker, J. and Bodendorf, F. and Weinhardt, C., Eds), Regensburg, Germany.

Alaranta, M. (2006) Managing the change process of the post-merger enterprise systems integration: A case study. *The International Journal of Information Systems and Change Management* 1 (1), 62-81.

Alaranta, M. and Henningsson, S. (2007) Shaping the post-merger information systems integration strategy. In proceedings of *40th Hawaii International Conference on System Science* Waikoloa, Hawaii, US.

Alaranta, M. and Parvinen, P. (2004) Contribution of governance theories of the firm to the analysis of m&a and post-merger integration of the information systems. In proceedings of *IRIS27*, Falkenberg, Sweden.

Alsene, E. (1999) The computer integration of the enterprise. *IEEE Transactions on Engineering Management* 46 (1), 26-35.

Alter, S. (1999) A general, yet useful theory of information systems. *Communications of the AIS* 1 (13),

Alter, S. (2003a) Sidestepping the it artifact, scrapping the is silo, and laying claim to systems in organizations. *Communications of the AIS* 12 (30),

Alter, S. (2003b) Sorting out issues about the core, scope, and identity of the is field. *Communications of the AIS* 12 (41),

Alvesson, M. and Sköldberg, K. (1994) *Tolkning och reflektion.* Studentlitteratur, Lund.

Amit, R. and Schoemaker, P. J. H. (1993) Strategic assets and organisational rent. *Strategic Management Journal* 14 (1), 33-46.

Analyzer', I. S. (1989) Dealing with mergers and acquisitions. *I/S Analyzer* 27 (3), 1-12.

Andreu, R. and Ciborra, C. (1996) Organisational learning and core capabilities development: The role of it. *The Journal of Strategic Information Systems* 5 (11), 111-127.

Argyris, C. (1974) Singel-loop and double-loop models in research on decision making. *Administrative Science Quarterly* 21 (3), 363-375.

Argyris, C. and Schön, D. (1978) *Organizational learning: A theory of action perspective.* Addisson-Wesley Publishing Company, Reading, MA.

Ashkanasky, N. M. and Holmes, S. (1995) Perceptions of organizational ideology following a merger: A longitudinal study of merging accounting firms. *Accounting,Organization and Society* 20 (1), 19-34.

Avison, D. E. and Fitzgerald, G. (1995) *Information systems development: Methodologies, techniques and tools.* Paul \& Company Publishers Consortium, Inc.\.

Bannermann, P. L. (2004) *The liability of newness: Toward a capability-based theory of information systems performance. For Doctor of Philosophy in Mangement degree.* Australian Graduate School of Management.

Barki, H. and Pinsonneault, A. (2005) A model of organizational integration, implementation effort, and performance. *Organization Science* 16 (2), 165-179.

Barney, J. S. (1991) Firm resources and sustained competitive advantage. *Journal of Management*, 99-120.

Baro, G. A. (2004) Mergers and acquisitions: An is/t perspective. Retrieved 2006-10-10 from http://web.njit.edu/~gab0650/SOTA-Baro.pdf.

Baskerville, R. L., Pries-Heje, J. and Venable, J. (2007) Soft design science research: Extending the boundaries of evaluation in design science research. In proceedings of *Second International Conference on Design Science Research in Information Systems and Technology*, Pasadena, CA.

Batelaan, M. and Veltman, J. (2002) Viljf mythes over postfusie ict-integratie. *Tijdschrift Management & Informatie* 10 (5), 50-58.

Bekier, M. M., Bogardus, A. J. and Oldham, T. (2001) Why mergers fail. *McKinsey Quarterly* (4),

Benbasat, I. and Zmud, R. (2003) The identity crisis within the is discipline: Defining and communicating the discipline's core properties. *MIS Quarterly* 27 (2), 183-194.

Bernus, P., Nemes, L. and Schmidt, G. (Eds.) (2003) *Handbook on enterprise architecture.* Springer-Verlag, Berlin.

Beynon-Davies, P. (2002) *Information systems: An introduction to informatics in organizations.* Palgrave, New York.

Bharadwaj, A. S. (2000) A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly* 24 (1), 169-196.

Biernerstein, N., Bose, S., Fiammante, M., Jones, K. and Shah, R. (2006) *Service-oriented architecture (soa) compass: Business value, planning, and enterprise roadmap.* IBM Press, New Jersey.

Boynton, A. C., Jacobs, G. C. and Zmud, R. (1992) Information technology planning in the 1990's: Directions for practice and research. *MIS Quarterly* 11 (1), 58-72.

Breindenbach, S. (2000) Managing mergers. *Network World* 17 (23), 68-74.

Broadbent, M. and Weill, P. (1997) Management by maxim: How business and it managers can create it infrastructures. *Sloan Management Review* 38 (3), 77-92.

Brown, A. E. and Grant, G. G. (2005) Framing the frameworks: A review of it governance research. *Communication of the AIS* 15, 696-712.

Brown, A. E. and Magill, S. L. (1994) Alignment of the is functions with the enterprise: Toward a model of antecedents. *MIS Quarterly* 18 (4), 371-404.

Brown, C. V. (1997) Examining the emergence of hybrid is governance solutions: Evidence from a single case site. *Information Systems Research* 8 (1), 69-95.

Brown, C. V., Clancy, G. and Scholer, R. (2003) A post-merger it integration success story: Sallie mae. *MIS Quarterly Executive* 2 (1), 15 – 27.

Brunetto, G. (2002) *Etude du processus d'integration des systèmes d'information lors de fusion de entreprises. RP? For degree.* Université Montpellier II, Montpellier.

Brunetto, G. (2006) Integrating information systems during mergers: Integration modes typology, prescribed vs constructed implementation process. In proceedings of *ECIS'06*, Göteborg, Sweden.

Bruton, G., Oviatt, B. M. and White, M. A. (1994) Performance of acquisitions of distressed firms. *Academy of Management Journal* 37, 972-989.

Bryman, A. (2001) *Social research methods.* Oxford University Press, Bath.

Buck-Lew, M., Wardle, C. E. and Pliskin, N. (1992) Accounting for information technology in corporate acquisitions. *Information & Management* 22 (6), 363-370.

Bunge, M. (1967) *Scientific research ii: The search for truth.* Springer Verlag, Berlin.

Buono, A. and Bowditch, J. L. (1989) *The human side of merges and acquisitions: Managing collisions between people, cultures and organizations.* Jossey Bass, San Francisco, Ca.

Burgelman, R. A. (1983) Corporate entrepreneurship and strategic management: Insights from a process study. *Management Science* 29 (12), 1349-1365.

Burgelman, R. A. (1988) Strategy making as a social learning process: The case of internal corporate venturing. *Interfaces* 18 (3), 74-86.

Capron, L. (1999) The long-term performance of horizontal acquisitions. *Strategic Management Journal* 20 (11), 987-1018.

Carlsson, S. and Henningsson, S. (2007) Managing information systems integration in corporate mergers and acquisitions. In *Adaptive technologies and business integration: Social, managerial and organizational dimension* (Cunha, M. M. and Putnik, G. D. and Cortes, B. C., Eds), Idea Group Inc Hershey, PA.

Carlsson, S. A. (2006) Towards an information systems design research framework: A critical realist perspective. In proceedings of *DESRIST 2006*, CGU, Claremont, CA.

Carlsson, S. A. (2008) Developing knowledge through is design science research: For whom, what type of knowledge, and how. *Scandinavian Journal of Information Systems* Forthcoming,

Carlsson, S. A., Henningsson, S., Hrastinski, S. and Keller, C. (2008) On how to develop design theories for is use and management. In proceedings of *ECIS 2008*, Galway, Ireland.

Carr, N. G. (2003) It doesn't matter. *Harvard Business Review* 81 (5), 41-49.

Cartwright, S. and Cooper, C. L. (1992) *Mergers & acquisitions: The human factor.* Butterworth-Heinemann, Oxford.

Cartwright, S. and Cooper, C. L. (1993a) The psychological impact of merger and acquisition on the individual; a study of building society managers. *Human Relations* 46, 327-347.

Cartwright, S. and Cooper, C. L. (1993b) The role of culture compatibility in successful organizational marriage. *Academy of Management Executive* 7 (2), 57-70.

Chakravarthy, B. S. and Lorange, P. (1984) Managing strategic adaptation: Options in administrative systems design. *Interfaces* 14 (1), 34-47.

Chan Yolande, E., Sabherwal, R. and Thatcher Jason, B. (2006) Antecedents and outcomes of strategic is alignment: An empirical investigation. *IEEE Transactions on Engineering Management* 53 (1), 27-47.

Chandra, C. and Kumar, S. (2001) Enterprise architectural framework for supply-chain integration. *Industrial Management + Data Systems* 101 (5-6), 290-304.

Checkland, P. and Holwell, S. (1988) *Information, systems and information systems: Making sense of the field.* Wiley, Chichester.

Checkland, P. and Scholes, J. (1990) *Soft systems methodology in action.* Wiley, Chichester.

Chiang, R. H. L., Lim, E.-P. and Storey Veda, C. (2000) A framework for acquiring domain semantics and knowledge for database integration. *Database for Advances in Information Systems* 31 (2), 46-64.

Cio-Magazine (2006) The state of the cio 2006: Your agenda. *CIO Magazine*, Retrieved 2006-10-08 from

http://www.cio.com/archive/010106/JAN1SOC.pdf

Classon, P. (2004) The business value of implementing a service oriented architecture. Liquidhub.

Clemons, E. K. and Row, M. C. (1991) Sustaining it advantage: The role of structural differences. *MIS Quarterly* 15 (3), 275-293.

Cohen, F. (2006) *Fastsoa: The way to use native xml technology to achieve service oriented architecture governance, scalability, and performance.* Elsevier Books, Oxford.

Computersweden (2006) *Computer Sweden*, Stockholm.

Consulting, C. (2000) Information technology management, in a merger and acquisition strategy. Compass Consulting.

Corbitt, G., Themistocleous, M. and Irani, Z. (2006) Erp/eai system issues and answers: A research journey. In proceedings of *39th Hawaii International Conference on System Sciences*.

Cording, M., Christmann, P. and Bourgeois Iii, L. (2002) A focus on resources in m&a success: A literature review and research agenda to resolve two paradoxes. In proceedings of *Academy of Management*.

Cox James, F. and Clark Steven, J. (1978) Material requirement planning systems development. *Computers & Industrial Engineering* 2 (3), 123-123.

Cross, R., Parker, A., Prusak, L. and Borgatti Stephen, P. (2001) Knowing what we know: Supporting knowledge creation and sharing in social networks. *Organizational Dynamics* 30 (2), 100-120.

Dahlbom, B. (1996) The new informatics. *Scandinavian Journal of Information Systems* 8 (2), 29-48.

Datta, D. K. (1991) Organizational fit and acquisition performance: Effects of post-acquisition integration. *Strategic Management Journal* 12 (4), 281-297.

Datz, T. (2004) Tjänstebaserad arkitektur lovar snabbare utveckling, effektivare arbete och enklare integration – om den installeras rätt. . IDG.

Davenport, T. H. (2005) The coming commoditization of processes. *Harvard Business Review* 83 (June), 100–108.

Dooley, K. J. and Van De Ven, A. H. (1999) Explaining complex organizational dynamics. *Organization Science* 10 (3), 358-372.

Dubé, L. and Paré, G. (2003) Rigor in information systems positivist case research: Current practices, trends, and recommendations. *MIS Quarterly* 27 (4), 597-636.

Dudas, M. and Tobisson, P. (2007) *Information systems integration in mergers and acquisitions. For Masters degree.* Lund University, Lund.

Duff, R. J. and Jain, M. (1998) Cfo's guide to edi: How can you controle the paperless environment? *The Journal of Corporate Accounting and Financing* 10 (1), 107-127.

Duke, A., Davies, J. and Richardson, M. (2005) Enabling a scalable service-oriented architecture with semantic web services. *BT Technology Journal* 23 (3), 191-201.

Eisenhardt, K. M. and Graebner, M. E. (2007) Theory building from cases: Opportunities and challenges. *Academy of Management Journal* 50 (1), 25-32.

Epstein Marc, J. (2004) The drivers of succcess in post-merger integration. *Organizational Dynamics* 33 (2), 174-189.

Epstein Marc, J. (2005) The determinants and evaluation of merger success. *Business Horizons* 48 (1), 37-46.

Erl, T. (2005) *Service-oriented architecture - concepts, technology, and design.* Prentice Hall.

Ettlie, J. E. and Reza, E. M. (1992) Organizational integration and process innovation. *Academy of Management Journal* 35 (4), 795-827.

Evgeniou, T. (2002) Information integration and information strategies for adaptive enterprises. *European Management Journal* 20 (5), 486-494.

Federal Trade Commission, F. T. C. (1975) F. T. C statistical report on mergers and acquisitions. U.S. Government Printing Office, Washington, D.C.

Feng, C., Shaoyun, L., Y., H., Ching-Huey, W. and William, C. C. (2005) Feature analysis for service-oriented reengineering. In proceedings of *the12th Asia-Pacific Software Engineering Conference*, Taipei, Taiwan.

Fiol, C. M. and Lyles, M. A. (1985) Organizational learning. *Academy of Management. The Academy of Management Review* 10 (4), 803-814.

Fowler, K. L. and Schmidt, D. (1989) Determinants of tender offer post-acquisition financial performance. *Strategic Management Journal* 10, 339-350.

Franck, G. (1990) Mergers and acquisitions: Competitive advantage and cultural fit. *European Management Journal* 8 (1), 40-43.

Gartner (2006) Gartner survey of 1,400 cios shows transformation of it organisation is accelerating *Gartner Press Release*, Retrieved 2007-11-10 from http://www.gartner.com/press_releases/asset_143678_11.html.

Gartner (2007) Gartner exp survey of more than 1,400 cios shows cios must create leverage to remain relevant to the business *Gartner Press Release*, Retrieved 2007-11-10 from http://www.gartner.com/it/page.jsp?id=501189.

Gefen, D. and Ragowsky, A. (2005) A multi-level approach to measuring the benefits of an erp system in manufacturing firms. *Information Systems Management* 22 (1), 18-25.

George, A. L. and Bennett, A. (2004) *Case studies and theory development in the social sciences.* MIT Press, London.

Gerring, J. (2007) *Case study research - principles and practices.* Cambridge University Press, Cambridge.

Giacomazzi, F., Panella, C., Pernici, B. and Sansoni, M. (1997) Information systems integration in mergers and acquisitions: A normative model. *Information & Management* 32, 289-302.

Gilman, R. (1977) Introduction to management information systems. *Academy of Management Review* 2 (2), 323-325.

Glouberman, S. and Mintzberg, H. (2001) Managing the care of health and the cure of disease—part ii: Integration. *Health Care Management Review* 26 (1), 70–84.

Goodman, B. (2000) It savings drive bank mergers. Retrieved 2007-10-10 from http://www.computerweekly.com/Articles/2000/01/27/175943/IT+savings+drive+bank+mergers.htm

Gottschalk, P. (2000) Studies of key issues in is management around the world. *International Journal of Information Management* 20 (3), 169-180.

Granebring, A. (2007) *Service oriented architecture. For Ph. D. in Industrial Economy degree.* Mälardaren University, Sweden, Västerås.

Grant, R., M. (1991) The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review* 33 (3), 114-136.

Grant, R. M. (1996a) Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science* 7 (4), 375-387.

Grant, R. M. (1996b) Toward a knowledge-based theory of the firm. *Strategic Management Journal* 17, 109-122.

Graves, D. (1981) Individual reactions to a merger of two small firms of brokers in the re-insurance industry: A total population survey. *Journal of Management Studies* 18 (1), 89-113.

Gregor, S. (2006) The nature of theory in information systems. *MIS Quarterly* 30 (3), 611-642.

Gregor, S. and Jones, D. (2007) The anatomy of a design theory. *Journal of the Association for Information Systems* 8 (5), 312-323,325-335.

Group, G. I. (1999) The business and it summit: Successfull it integration strategies for mergers and beyond 1999. Giga Information Group, pp 18-19.

Guba, G. G. and Lincoln, Y. S. (1994) Competing paradigms in qualitative research. In *Handbook of qualitative research* (Lincoln, N. K. D. A. Y., Ed), Sage, Thousand Oaks, CA.

Gulledge, T. (2006) What is integration? *Industrial Management & Data Systems* 106 (1), 5-20.

Gupta, A. (2000) Enterprise resource planning: The emerging organizational value systems. *Industrial management and data systems* 100 (3), 114-118.

Gurjar, N. S., Jha, M. K., Jog, S. D. and Amanullah, S. (2002) Impact of information systems implementations on vertical mergers and acquisitions: A framework. In proceedings of *inSITE 2002*

Gustafsson, M. R., Karlsson, T. and Bubenko, J. A. (1982) A declarative approach to conceptual information modeling. In *Ifip wg8.1 working conference on information systems design methodologies: A comparative review* (Olle, T. W. and Sol, H. G. and Verryn-Stuart, A. A., Eds), North-Holland.

Haleblian, J. and Finkelstein, S. (1999) The influence of organizational acquisition experience on acquisition performance: A behavioral perspective. *Administrative Science Quarterly* 44, 29-56.

Hanseth, O. (2000) The economics of standards. In *From control to drift. The dynamics of corporate information infrastructures* (Ciborra, C., Ed), Oxford University Press, Oxford.

Hanseth, O. and Braa, K. (2001) Hunting for the treasure at the end of the rainbow. Standardizing corporate it infrastructure. *Journal of Collaborative Computing* 10 (3-4), 261-292.

Haspeslagh, C. and Jemison, B. (1991) *Managing acquisitions. Creating value through corporate renewal.* The Free Press, New York, Ny.

Hedman, J. and Kalling, T. (2003) The business model concept: Theoretical underpinnings and empirical illustrations. *European Journal of Information Systems* (12), 49-59.

Henderson, J. and Venkatraman, N. (1992) Strategic alignment: A model for organizational transformation through information technology. In *Transforming organizations* (Kochan, T. A. and Useem, M., Eds), pp 97-117, Oxford University Press, New York, N.Y.

Henningsson, S. (2005a) The role of is in corporate m&a In proceedings of *IRIS'28 (Information Systems Research in Scandinavia)*, Lillesand, Norway.

Henningsson, S. (2005b) Managing enterprise systems integration in corporate mergers and acquisitions - a tentative framework and the case of tih. In proceedings of *IBIMA'05*, Cairo, Egypt.

Henningsson, S. (2005c) Is integration in corporate m&a: Applicability of related theory and future advancements of the research field. In proceedings of *IBIMA'05*, Cairo, Egypt.

Henningsson, S. (2006a) The importance of is integration in m&a - fact or folklore? In proceedings of *Unpublished draft*.

Henningsson, S. (2006b) The role of is in corporate m&a - an examination of is research based on an integrative model for m&a research. *ICFAI Journal of Mergers & Acquisitions* (March 2006),

Henningsson, S. (2007) The relation between is integration and m&a as a tool for corporate strategy. In proceedings of *40th Hawaii International Conference on System Science* Waikoloa, Hawaii, US.

Henningsson, S. and Carlsson, S. (2006a) Governing and managing enterprise systems integration in corporate m&a In proceedings of *European Conference on Information Systems 2006*, Gothemburg, Sweden.

Henningsson, S. and Carlsson, S. (2006b) Governing and managing enterprise systems integration in corporate m&a In proceedings of *ECIS 2006*, Gothemburg, Sweden.

Henningsson, S. and Carlsson, S. (2007) The dynamic relation between is integration and the acquisition process. In proceedings of *APMC2007* Melbourne, Australia.

Henningsson, S. and Selander, L. (2007) Dancing to the post-acquisition integration blues: An organizational learning perspective on post-acquisition is integration in multinational companies. In proceedings of *23rd EGOS Colloquium*, Vienna, Austria.

Henningsson, S., Svensson, C. and Wallén, L. (2007) Mastering the integration chaos following frequent m&as: Is integration with soa technology. In proceedings of *40th Hawaii International Conference on System Science* Waikoloa, Hawaii, US.

Henry, D. (2002) There's no magic in mergers. *Business Week*, 60.

Hevner, A. R., March, S. T., Park, J. and Ram, S. (2004) Design science in information systems research. *MIS Quarterly* 28 (1), 75-105.

Higgens, R. C. and Schall, L. D. (1975) Corporate bankcrupcy and conglomerate merger. *Journal of Finance* (30), 1003-1014.

Hilgers, L., Marcolin, B., Chiasson, M. and Javidan, M. (2004) Strategic is alignment: The necessity for a hybrid framework linking shared vision,leadership, change management and diffusion theory. *System Sciences, 2004. Proceedings of the 37th Annual Hawaii International Conference on*, 219-227.

Hirschheim, R. and Klein, H. K. (2003) Crisis in the is field? A critical reflection on the state of the dicipline. *Journal of the Association for Information Systems* 4 (5), 237-293.

Hirschheim, R. and Sabherwal, R. (2001) Detours in the path toward strategic information systems alignment. *California Management Review* 44 (1), 87-109.

Hitt, M. A., Harrison, J. S., Ireland, R. D. and Best, A. (1993) Lifting the veil of success in mergers and acquisitions. In proceedings of *Annual Meeting of the Strategic Management Society*, Cambridge University Press, Chicago.

Howell, R. A. (1970) Plan to integrate your acquisitions. *Harvard Business Review* 48 (6), 66-76.

Hrastinski, S., Keller, C. and Carlsson, S. A. (2007) An initial design theory for when to support synchronous communication in e-learning environments.

Hwang , M. I. (2004) Integrating enterprise systems in mergers and acquisitions. In proceedings of *the Tenth Americas Conference on Information Systems*.

I/S-Analyzer (1989) Dealing with mergers and acquisitions. *I/S Analyzer* 27 (3), 1-12.

Iivari, J. (2005) Information systems as a design science. In *Information systems development. Advances in theory, practice, and education* (Vasilecas, O. and Wojtkowski, W. and Zupančič, J. and Caplinskas, A. and Wojtkowski, G. and Wrycza, S., Eds), Springer New York.

Iivari, J. (2007) A paradigmatic analysis of information systems as a design science. *forthcoming in Scandinavian Journal of Information Systems*,

Jeminson, D. and Sitkin, S. (1986) Corporate acquisitions: A process perspective. *Academy of Management Review* 11 (1), 145-163.

Johnson, S. B. (2003) Systems integration and the social solution of technical problems in complex systems. In *The business of systems integration* (Principe, A., Davies, A., Hobday, M. , Ed), Oxford University Press, Oxford.

Kalling, T. (2003) Erp systems and the strategic management processes that lead to competitive advantage. *Information Resources Management Journal* 16 (4), 46-67.

Kallinikos, J. (2001) *The age of flexibility: Managing organizations and technology.* Academia-Adacta, Lund.

Kashyap, R. N. (1972) Management information systems for corporate planning and control. *Long Range Planning* 5 (2), 25-31.

Kayworth, T. and Sambamurthy, V. (2000) Managing the information technology infrastructure. *Baylor Business Review* 18 (1), 13-15.

Kitching, J. (1973) *Acquisition in europe: Causes of corporate successes and failures.* Business International, Geneva.

Klein, G., Jiang, J. J. and Saunders, C. (2006) Leading the horse to water. *Communications of the AIS* (18), 259-274.

Knorr, E. and Rist, O. (2005) 10 steps soa. *InfoWorld* 27 (45),

Kpmg (2001) World class transactions: Insights into creating shareholder value through mergers and acquisitions. KPMG.

Krekel, N., Van Der Woerd, T. and Wouterse, J. (1969) *Mergers: An european approach to technique.* Business Books, London.

Lager, M. (2005) What is soa? *Customer Relationship Management* 9 (11),

Lajoux, A. R. (1998) *The art of m&a integration.* McGraw-Hill, New York.

Langefors, B. (1978) *Theoretical analysis of information systems.* Studentlitteratur, Lund.

Langefors, B. (1993) *Essays on infology.* Göteborg University, Gothenburg.

Larsson, R. (1990) *Coordination of action in m&a. Interpretive and systems approaches towards synergy.* Lund University, Lund.

Larsson, R. and Lubatkin, M. (2001) Achieving acculturation in mergers and acquisitions: An international case survey. *Human Relations* 54 (12), 1573-1607.

Lawrence, P. R. and Lorsch, J. W. (1969) *Organization and environment.* Graduate School of Business Adminsitration, Harvard University, Boston, MA.

Lee, J., Siau, K. and Hong, S. (2003) Enterprise integration with erp and eai. *Association for Computing Machinery. Communications of the ACM* 46 (2), 54-60.

Legare, T., L. (2002) The role of organizational factors in realizing erp benefits. *Information Systems Management* 19 (4), 21-42.

Legare Thomas, L. (2002) The role of organizational factors in realizing erp benefits. *Information Systems Management* 19 (4), 21-42.

Lengnick-Hall Cynthia, A. and Lengnick-Hall Mark, L. (2006) Hr, erp, and knowledge for competitive advantage. *Human Resource Management* 45 (2), 179-194.

Lewellen, W. G. (1971) A pure financial rationale for the conglomerate merger. *Journal of Finance* 26, 521-542.

Levinson, H. (1970) A psychologist diagnoses merger failures. *Harvard Business Review* 48 (March-April), 139-147.

Lidd, S. J. (1979) The pressing need for management information systems. *Management Focus* 26 (5), 44-44.

Linthicum, D. (2001) *B2b application integration.* Addison Wesley, Reading, Ma.

Lohrum, C. (1992) Integration av människor och kulturer efter ett företagsköp - en fallstudie. *Research Reports* Swedish School of Economics and Business Administration, Helsinki, Finland.

Lubatkin, M. (1983) Mergers and the performence of the acquiring firm. *The Academy of Management Review* 8 (2), 218-225.

Lubatkin, M. and Lane, P. J. (1996) Psst...The merger mavens still have it wrong! *The Academy of Management Executive* (February 1996),

Lubatkin, M. H. (1988) Value-creating mergers: Fact or folklore? *Academy of Management Executive* 2 (4), 295-303.

Luftman, J., Kempaiah, R. and Nash, E. (2006) Key issues for it executives 2005. *MIS Quarterly Executive* 5 (2),

Lusa, J. M., Isaacs, G. U. and E., O. R. (1979) Computers in manufacturing: Top management involvement needed/successful systems are designed by users. *Infosystems* 26 (11), 41-41.

Malone, T. W., Crowston, K. and Herman, G. A. (2003) *Organizing business knowledge: The mit process handbook.* MIT Press.

March, J. G. (1991) Exploration and exploitation in organizational learning. *Organization Science* 2 (1), 71–87.

March, S. T. (2006) Designing design science. In *Information systems: The state of the field* (King, J. L. and Lyytinen, K., Eds), pp 338-344, Wiley, Chichester.

March, S. T. and Smith, G. (1995) Design and natural science research on information technology. *Decision Support Systems* 15 (4), 251-266.

Marchetti, C., Virgillito, A., Mecella, M. and Baldoni, R. (2001) Integrating autonomous enterprise systems through dependable corba objects. *Autonomous Decentralized Systems, 2001. Proceedings. 5th International Symposium on*, 204-211.

Marks, M. L. (1982) Merging human resources: A review of current research. *Mergers and Acquisitions* 17, 38-44.

Markus, M. L. (2000) Paradigm shifts - e-business and business/systems integration. *Communication of the AIS* 4 (10), 1-45.

Markus, M. L., Majchrzak, A. and Gasser, L. (2002) A design theory for systems that support emergent knowledge processes. *MIS Quarterly* 26 (3), 179-212.

Markus, M. L. and Robey, D. (1988) Information technology and organizational change: Causal structure in theory and research. *Management Science* 34 (5), 583-598.

Marshall, C. and Rossman, G. (1991) *Designing qualitative research* Sage, Thousand Oaks.

Mata, F. J., Fuerst, W. L. and Barney, J. B. (1995) Information technology and sustained competitive advantage: A resource-based analysis. *MIS Quarterly* 19 (4), 487-506.

Mathiassen, L. (2002) Collaborative practice research. *Information Technology & People* 15 (4), 321-345.

Mays, N. and Pope, C. (1995) Rigour and qualitative research. *BMJ* 311, 109-112.

Mckiernan, P. and Merali, Y. (1995) Integrating information systems after a merger. *Long Range Planning* 28 (4), 54-62.

Mehta, M. and Hirschheim, R. (2004) A framework for assessing it integration decision-making in mergers and acquisitions. In proceedings of *37th Hawaii International Conference on System Sciences*.

Mehta, M. and Hirschheim, R. (2007) Strategic alignment in mergers & acquisitions: Theorizing is integration decision making. *Journal of the Association for Information Systems* 8 (3), 143-174.

Mendoza Luis, E., Pã©Rez, M. A. and Grimã¡N, A. (2006) Critical success factors for managing systems integration. *Information Systems Management* 23 (2), 56-75.

Merali, Y. and Mckiernan, P. (1993) The strategic positioning of information systems in post-acquisition management. *Journal of Strategic Information Systems* 2 (2), 105 – 124.

Miles, M. B. and Huberman, A. M. (1994) *Qualitative data analysis.* Sage Publications, Thousand Oaks.

Miller, J. (2007) Merger and acquisition drivers remain in place for 2007. *Pharmaceutical Technology* 31 (2), 84,86-84,86.

Miller, S. (2002) Emerging titans. *Foreign Direct Investments* (2 dec),

Mingers, J. (2003) The paucity of multi-method research: A review of the information systems literature. *Information Systems Journal* (13), 233-249.

Mintzberg, H. (1994) The fall and rise of strategic planning. *Harvard Business Review* 72 (1), 107-115.

Mohr, L. B. (1982) *Explaining organizational behavior.* Jossey-Bass Publishers, San Francisco, CA.

Myers, M. D. (2003) Defining the core properties of the is disciplines: Net yet, not now. *Communications of the AIS* 12 (38), 582-587.

Nahavandi, A. and Malekzadeh, A. R. (1988) Acculturation in mergers and acquisitions. *Academy of Management Review* 13 (1), 79-80.

Nair, S. and Mazouch, A. (2007) *Proactive information system integration: A concept of is integration in mergers and acquisitions. For Masters degree.* Lund University, Lund.

Napier, N. K. (1989) Mergers and acquisitions, human resource issues and outcomes: A review and suggested typology. *Journal of Management Studies* 29 (3), 271-289.

Nicb, N. I. C. B. (1929) *Mergers in industry: A study of certain economic aspects of industrial consolidation.* National Industrial Conference Board, New York.

Nonaka, I. (1994) A dynamic theory of organizational knowledge creation. *Organization Science* 5 (1), 14-37.

Nonaka, I. and Takeuchi, H. (1995) *The knowledge-creating company.* Oxford University Press, New York.

Norton, L. (1998) Merger mayhem. Barron's.

Olson, M. H. and Chervany, N. L. (1980) The relationship between organizational characteristics and the structure of the information services function. *MIS Quarterly* 4 (2), 57-69.

Orlikowski, W. and Iacono, S. (2001) Research commentary: Desperately seeking the ₹it₹ in it research • a call to theorizing the it artifact. *Information Systems Research* 12 (2), 121-134.

Orton, J. D. and Weick, K., E. (1990) Loosely coupled systems: A reconceptualization. *Academy of Management. The Academy of Management Review* 15 (2), 203-224.

Pablo, A. L. (1994) Determinants of acquisition integration level: A decision-making perspective. *Academy of Management Journal* 37, 803-836.

Parenteau, R. and Weston, F. (2003) It's never too early to think integration. *Mergers and Acquisitions* 38 (11), 17-23.

Parvinen, P. M. T. (2003) *Towards a governance perspective to mergers and acquisition. For Doctorial degree.* Helsinki University, Helsinki.

Pawson, R. and Tilley, N. (1997) *Realistic evaluation.* Sage, London.

Peppard, J. and Ward, J. (2004) Beyond strategic information systems: Towards an is capability. *The Journal of Strategic Information Systems* 13 (2), 167-194.

Perry, J. S. and Herd, T. J. (2004) Mergers and acquisitions: Reducing m&a risk through improved due dilligence. *Strategy & Leadership* 32 (2), 12-19.

Petrie, C. (1992) Preface. In proceedings of *Enterprise Integration Modeling: Proceedings of the First International Conference*, pp xi–xii, Cambridge, MA: MIT Press.

Phios (1999) New tools for managing business processes. Phios Corporation, Cambridge, MA.

Porter, M. (1987) From competitive advantage to competitive strategy. *Harvard Business Review* 65 (3), 43-59.

Porter, M. (1996) What is strategy? *Harvard Business Review* (Nov-Dec), 61-78.

Porter, M. E. (1980) *Competitive strategy.* Free Press, New York.

Porter, M. E. (1985) *Competitive advantage.* Free Press, New York.

Powell, T. C. (1992) Organizational alignment as competitive advantage. *Strategic Management Journal* 13 (2), 119-135.

Powell, T. C. and Dent-Micallef, A. (1997) Information technology as competitive advantage: The role of human, business, and technology resources. *Strategic Management Journal* 18 (5), 375-405.

Prahalad, C. K. and Hamel, G. (1990) The core competence of the corporation. *Harvard Business Review* 68 (3), 79-92.

Pritchett, P. (1985) *After the merger: Managing the shockwaves.* Dow Jones-Irwin, Homewood, Ill.

Pushman, T. and Alt, R. (2001) Enterprise application integration: The case of robert bosch group. In proceedings of *HICSS'34*, Hawaii, USA.

Pyburn, P. J. (1983) Linking the mis plan with corporate strategy: An exploratory study. *MIS Quarterly* 7 (2), 1-14.

Quinn, J. B. (1978) Strategic change: "Logical incrementalism". *Sloan Management Review* 20 (1), 7.

Ranft, A. and Lord, M. (2002) Acquiring new technologies and capabilities: A grounded model of acquisition implementation. *Organization Science* 13 (4), 420-441.

Risberg, A. (1999) *Ambiguities thereafter - an interpretive approach to acquisitions.* Lund University Press, Lund.

Risberg, A. (2003) The merger and acquisition process. JIBS literature review. Retrieved 2005-01-10 from

http://copenhagen.jibs.net/LitReview/2003/2003_1_34.pdf

Robbins, S. S. and Stylianou, A. C. (1999) Post-merger systems integration: The impact on is capabilities. *Information & Management* 36, 205-212.

Robson, C. (2002) *Real world research.* Blackwell Publishing, Cornwall.

Rodgers, M. (2005) Stay hungry. *CIO Magazine* (8 April 2005), Retrieved 2007-11-20 from http://www.cio.com.au/index.php/id;452911258;pp;5.

Romme, A. G. L. (2003) Making a difference: Organization as design. *Organization Science* 14 (5), 558-573.

Rosemann, M. and Vessey, I. (2008) Toward improving the relevance of information systems research to practice: The role of applicability checks. *MIS Quarterly* 32 (1),

Sambamurthy, V. and Zmud, R. (2000) Research commentary: The organizing logic for an enterprise's it activities in the digital era – a prognosis of practice and a call for research. *Information Systems Research* 11 (2), 105-115.

Samtani, G., Healy, M. and Samtani, S. (2002) *B2b integration: A practical guide to collaborative e-commerce.* Imperial College Press, London.

Sapolsky, H. M. (2003) Inventing systems integration. In *The business of systems integration* (Principe, A., Davies, A., Hobday, M. , Ed), Oxford University Press, Oxford.

Schweiger, D. (2002) *M&a integration : A framework for executives and managers.* McGraw-Hill.

Schweiger, D. M. and Goulet, P. M. (2000) Integrating mergers and acquisitions: An international research review. *Advances in Mergers and Acquisitions* 1, 61-92.

Schweiger, D. M., Ivancevich, J. M. and Power, F. R. (1987) Executive actions for managing human resources before and after acquisition. *Academy of Management Executive* 1 (2), 127-138.

Segars, A. H. and Grover, V. (1999) Profiles of strategic information systems planning. *Information Systems Research* 10 (3), 199-233.

Shearer, B., Stern, A. and Pittman, S. (2004) Avoiding the it integration blues. *Mergers & Acquisitions* 39 (11), 10-16.

Shepherd, W. G. (1979) *The economies of industrial organization.* Prentice-Hall, Englewood Cliffs, NJ.

Sherman, H. D. and Rupert, T. J. (2006) Do bank mergers have hidden or foregone value? Realized and unrealized operating synergies in one bank merger. *European Journal of Operational Research* 168 (1), 253-268.

Shrivastava, P. (1986) Post-merger integration. *Journal of Business Strategy* 7 (1), 65-76.

Silva, L., Figueroa B, E. and Gonzalez-Reinhart, J. (2007) Interpreting is alignment: A multiple case study in professional organizations. *Information and Organization* 17 (4), 232-265.

Simon, H. A. (1996) *The sciences of the artificial.* MIT Press, Boston.

Sirower, M. L. (2003) Investor communications; new rules for m&a success. *Financial Executive* 19 (1), 26-30.

Smith, H. A. and Mckeen, J. D. (2006) Development in practice xxii: Expertise location and management: Hope or hype? *Communication of the AIS* 18 (3), 44-54.

Stake, R. E. (1995) *The art of case study research.* Sage, CA.

Star, S. L. and Ruhleder, K. (1996) Steps toward an ecology of infrastructure: Design and access for large information space. *Information Systems Research* 7 (1), 111-134.

Stratman Jeff, K. (2007) Realizing benefits from enterprise resource planning: Does strategic focus matter? *Production and Operations Management* 16 (2), 203-216.

Stylianou, A. C., Jeffries, C. J. and Robbins, S. S. (1996) Corporate mergers and the problem of is integration. *Information & Management* 31, 203-213.

Teece, D. J., Pisano, G. and Shuen, A. (1997) Dynamic capabilities and strategic management. *Strategic Management Journal* 18 (7), 509-533.

Thompson, J. D. (2003) *Organizations in action: Social science bases of administrative theory.* Transaction Publishers, Edison, NJ.

Tranfield, D., Denyer, D. and Smart, P. (2003) Towards a methodolgy for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management* 14, 207-222.

Trautwein, F. (1990) Merger motives and merger prescriptions. *Strategic Management Journal* 11 (4), 283-295.

Trelleborg (2006) Annual report 2005. Trelleborg AB.

Trelleborg (2007) Annual report 2006. Trelleborg AB.

Truman, G. E. (2000) Integration in electronic exchange environments. *Journal of Management Information Systems* 17 (1), 209-244.

Vaishnavi, V. K. and Kuechler Jr, W. (2008) *Design science research methods and patterns.* Auerbach Publications, Boca Ranton, Fl.

Walls, J. G., Widemeyer, G. R. and El Sawy, O. A. (1992) Building an information systems design theory for vigilant eis. *Information Systems Research* 3 (1), 36-59.

Walls, J. G., Widemeyer, G. R. and El Sawy, O. A. (2004) Assessing information system design theory in perspective: How useful was our 1992 initial rendition? *Journal of Information Technology Theory and Application* 6 (2), 43-58.

Walter, G. (1985) Key acquisition integration processes for four strategic orientations. *the 45th annual meeting of the Academy of Management*, San Diego, Ca.

Van Aken, J. E. (2004) Management research based on the paradigm of the design sciences: The quest for field-tested and grounded technological rules. *Journal of Management Studies* 41 (2), 219-246.

Van Aken, J. E. (2005a) Management research as a design science: Articulating the research products of mode 2 knowledge production in management. *British Journal of Management* 16 (1), 19-36.

Van Aken, J. E. (2005b) Valid knowledge for the professional design of large and complex design processes. *Design Studies* 26 (4), 379-404.

Van Aken, J. E. (2006) The nature of organizing design: Both like and unlike material object design (working paper 06.13). Eindhoven Centre for Innovation Studies, Technische Universiteit Eindhoven, The Netherlands.

Van De Ven, A. H. (1992) Suggestions for studying strategy process: A research note. *Strategic Management Journal* 13, 169-191.

Van De Ven, A. H. and Poole, M. S. (1995) Explaining development and change in organizations. *Academy of Management Review* 20 (3), 510-541.

Van Grembergen, W. (2005) Introduction to the minitrack "It governance and its mechanisms". *System Sciences, 2005. HICSS '05. Proceedings of the 38th Annual Hawaii International Conference on*, 235-235.

Waring, T. and Wainwright, D. (2000) Interpreting integration with respect to information systems in organizations – image, theory and reality. *Journal of Information Technology* 15, 131-148.

Webb, P., Pollard, C. and Ridley, G. (2006) Attempting to define it governance: Wisdom or folly? *System Sciences, 2006. HICSS '06. Proceedings of the 39th Annual Hawaii International Conference on* 8, 194a-194a.

Weber, R. (2003) Still desperately seeking for the it artifact (editor's comments). *MIS Quarterly* 27 (2),

Weber, Y. and Pliskin, N. (1996) Effects of information systems integration and organizational culture on a firm's effectiveness. *Information and Management* 30 (2), 81-90.

Weber, Y. and Schweiger, D. M. (1992) Top management culture conflict in mergers and acquisitions: Lesson from anthropology. *The International Journal of Conflict Management* 3, 285-301.

Webster, J. and Watson, R. (2002) Analyzing the past to prepare for the future: Writing a litterature review. *MIS Quarterly* 26 (2), pp. xiii-xxiii.

Weill, P. (2004) Don't just lead govern: How top-performing firms govern it. *MIS Quarterly Executive* 3 (1), 1-17.

Weill, P. and Broadbent, M. (1998) *Leveraging the new infrastructure* Harvard Business School Press, Boston.

Weingard, M. (1979) The rockford files: A case for the computer. *Management Accounting* 60 (10), 36-36.

Venable, J. (2006) A framework for design science research activities. In proceedings of *2006 Information Resource Management Association Conference* Washington, DC, US.

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

Willcocks, L., Feeny, D. and Olson, N. (2006) Implementing core is capabilities: Feeny-willcocks it governance and management framework revisited. *European Management Journal* 24 (1), 28-37.

Von Simons, E. M. (1995) The recentralization of it. *Compterworld* 29 (51), 1-5.

Wong-Bushby, I., Egan, R. and Isaacson, C. (2006) A case study in soa and re-architecture at company abc. In proceedings of *39th Hawaii International Conference on System Sciences*.

Yefim, V. N. (2003) Service-oriented architecture scenario, av-19-6751. Gartner Research.

Yin, R. K. (1994) *Case study research.* Sage Publications, Thousand Oaks.

Zaheer, A. and Venkatraman, N. (1994) Determinants of electronic integration in the insurance industry: An empirical test. *Management Science* 40 (5), 549-566.

Zhu, H. (2005) Building reusable components with service-oriented architectures. In proceedings of *2005 IEEE International Conference on Information Reuse and Integration (IEEE IRI-2005)*, Las Vegas, Nevada, USA, .

Zollo, M. and Singh, H. (2004) Deliberate learning in corporate acquisitions: Post-acquisition strategies and integration capability in u.S. Bank mergers. *Strategic Management Journal* 25 (13), 1233-1257.

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