

Post-merger IT integration strategies: An IT alignment perspective

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Abstract

When a company decides to merge with or to acquire another company, a major question is to what extent to integrate the information technologies and the organization. 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. The current literature in this field is meager and has not yet resulted in a theory. For this purpose, we developed a variant of the IT alignment model. In this model, we identify three ambition levels of mergers and IT integration from the literature. Additionally, we describe four integration methods that fit with these ambitions. The relations between these objectives and methods are moderated by contextual factors. Three hospital cases, with different merger and IT integration ambitions, describe the practice of this model. The case studies also add several new variables and relations to it. This result facilitates further research in post-merger IT integration by delivering an empirical research model.

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1. Introduction and research problem

A merger is initiated when more than one organisation agrees to combine into a single organisation. A merger can be achieved by full or partial absorption of a target company (Giacomazzi et al., 1997; Haspeslagh and Jemison, 1991). Some authors distinguish a merger and an acquisition by the level of equality between the merging partners,

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i.e. whether it involves equal (merger) or non-equal (acquisition) parties in terms of their size and power (Brown and Renwick, 1996). This is a rather confusing terminology, because the term acquisition is often used for “...an act of exchange by which a company, called a bidder company, uses money, stocks or their combination, to acquire some assets of the target company” (Giacomazzi et al., 1997, p. 290). Although the term acquisition may include the full acquisition of another company, it also includes exchanges of much smaller assets that are not the topic of this article.

Merger agreements can take place between parties that operate and compete within the same industry or business sector (so-called horizontal mergers), and between parties that offer access to distinct levels in the value chain (so-called vertical mergers). A number of combinations of horizontal and vertical mergers are possible, referred to as conglomerate mergers (Brown and Renwick, 1996; Gaughan, 1996; Giga Information Group, 1999; Haspeslagh and Jemison, 1991; Kitching, 1967; Weston et al., 1990). This article is restricted to mergers between two parties, which is the most common merger case.

Growing competition in the business environment drives many companies into mergers (Bibler, 1989; Haspeslagh and Jemison, 1991; Nadler et al., 1992; Nawas, 1995). Through mergers, a number of objectives are aimed at like rapid growth, increased market share, market/product diversification, economies of scale and scope, and new businesses operations and technologies (Haspeslagh and Jemison, 1991). Unfortunately, managers have substantial problems of making a merger work (Giga Information Group, 1999; Pritchett, 1987).

IT integration is mentioned as one of the crucial factors for successful mergers (Batelaan and Veltman, 2002; Giga Information Group, 1999). After a merger contract formation, the IT departments are often expected to consolidate the systems as quickly as possible with minimal disruptions to the business. This is a complex task in itself, as McKiernan & Merali note (1995: 55): “One of the main reasons for poor post-merger performance is the failure of organizations to fully consider the IT implications of mergers. Causes for the performance failures do often relate to the definition and development of the new IS and IT infrastructure requirements.” IT integration, though, is often given insufficient priority in merger discussions, with the management seemingly focussing more on the strategic and organisational compatibility of the two firms and leaving the IT issue to a later stage (Buck-Lew et al., 1992; Stylianou et al., 1996).

Deciding on how to integrate the IT in merger contexts requires a view that includes strategic, organizational and IT characteristics. Currently, scientific guidelines do not exist for the process of selecting a proper IT integration strategy. 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). The purpose of this research is to develop theory that may help merger and IT managers to select a proper post-merger IT integration strategy. We do not have the ambition to find the one best strategy, which probably does not exist, but we do aim at a theory that helps to find an IT integration strategy that is aligned with the business objectives of the merger and that fits with the organisational and IT context of the merging organisations. Thus, we approach the post-merger IT integration strategy selection problem as an IT alignment problem.

This research ambition gives the current fragmented and pioneering research on post-merger IT integration a relevant framework, and thus a foundation for systematic progress. This research also gives the IT alignment literature a new application domain to further explore its nature and opportunities.

Following the IT alignment approach (Earl, 1996; Henderson and Venkatraman, 1992), the actual business goals—or in our context merger objectives—and nature of the organisational processes and infrastructure should feed the choices with regard to the IT strategy and the IT processes and infrastructure. The IT strategy and IT processes and infrastructure, in return, both enable and constrain certain merger objectives, and organisational designs. Fig. 1 gives Henderson and Venkatraman's alignment model and the additions needed to make this model relevant for post-merger IT integration (for other applications of the IT alignment perspective see e.g. Ba et al., 2001; Chan et al., 1997; Reich and Benbasat, 2000; Sabherwal and Chan, 2001 and Zee and De Jong, 1999). Fig. 1 also serves as a capstone for the research questions of this study.

Fig. 1 gives the four fields of Henderson and Venkatraman's (1992) alignment model (business strategy, I/T strategy, organisational infrastructure and processes, and I/T infrastructure and processes). All these four fields have direct relations with each other. The technology leverage variant of this model, also named the business-led information systems strategy approach (Earl, 1993), focuses on how the business strategy influences the IT infrastructure via the IT strategy. We regard post-merger IT integration as an example of such a technology leverage process, and thus require a uni-directional relation between business goals and IT Strategy. IT integration strategy, though, is split up into objectives and concrete ways (methods) of realising the intentions of a business (merger) strategy. Venkatraman and Henderson (1992) identify a two directional arrow between IT strategy and IT infrastructure and processes and between IT strategy and Organisational infrastructure and processes. These organisational and IT infrastructures and processes are given conditions as well as opportunities or priorities for the IT integration (Stylianou et al., 1996).

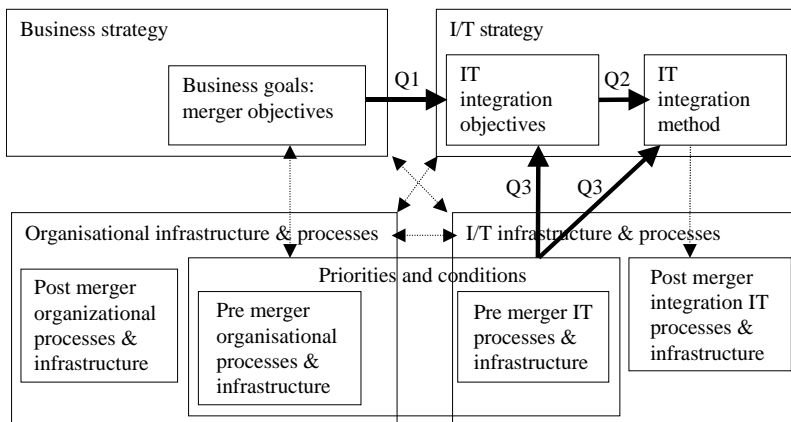


Fig. 1. Post-merger IT integration alignment model. Fields in bold and thick arrows denote the research topics.

It should be noted that the actual outcomes of the new IT Processes and Infrastructures for the new Organisational Processes and Infrastructure are beyond the scope of this study. Similarly, the way the Organisational and IT Process and Infrastructure influence the Business strategy is not considered.

The main research question is: What IT Integration Strategy fits in the context of post-merger situations? Following Fig. 1, this question concerns the following topics:

- Q1. What IT integration objectives are consistent with what type of merger?
- Q2. What integration methods are consistent with which IT integration objectives?
- Q3. What priorities and conditions (IT and organizational processes and infrastructures) influence decisions concerning IT integration strategies (objectives and methods)?

The rest of this article consists of a literature section, a case studies section, and a conclusions section. In Section 2, we define merger objectives, and related IT integration strategies in terms of their objectives and methods. The literature section also describes the conditions and priorities and how these influence possible merger objectives and IT integration strategies. Despite these insights, the literature on post-merger IT integration is meagre and has little theoretical foundations. Section 3 applies the literature we studied to observe the practice of post-merger IT integration in three hospitals. The three hospitals cover the different ambition levels of mergers and IT integration objectives, and thus demonstrate theoretical variation over the main variables, which enables the discovery of additional theoretical insights from practice (Glaser and Strauss, 1967). Section 4 describes the results and presents a model for further empirical research.

2. Literature study

2.1. Merger objectives

Haspeslagh and Jemison (1991) state that mergers may differ on the level of strategic interdependence and organisational autonomy the merging firms aim at. Three merger objectives can be identified (Haspeslagh and Jemison, 1991; McKiernan and Merali, 1995):

- *Absorption*: the target company is completely absorbed by the bidder company to form one new entity in which the target company ceases to exist. Such mergers are specifically made to achieve benefits of scale and to increase market share. The main synergy benefit is cost reduction that can be achieved through, for example, resource rationalisation by combining redundant processes, deploying one standardised IT, resource sharing, and the integration of similar business functions such as sales or production. This strategy thus requires complete integration of the operations, IT, organisation and culture.
- *Symbiosis*: a merger strategy in which synergy is created by combining only the strengths of both parties. Scope advantages are possible since complementing capabilities are obtained to enhance the resulting company's market power. As an

example, Computer Associates International acquired many small software companies to become a full-line producer of software (Haspeslagh and Jemison, 1991). In this strategy, the processes in each company that contribute to the strategic purpose of the merger are left intact and those that are similar are combined to reduce redundancy; and thus only partial integration takes place.

- *Preservation*: in this strategy, the capabilities of the acquired company are nurtured and maintained in order to allow them to further exploit and develop their capabilities from which the bidder company can benefit. Here, the benefits of the merger are based on the strengths of the target company that should be preserved. As the operations remain autonomous, no integration occurs.

2.2. IT integration strategies

An IT integration strategy is the route to establishing the desired level of IT integration, and consists, as mentioned in Section 1, of IT integration objectives and an IT integration method. Integrating IT is confronted with complex issues such as deciding on merging or not merging the IT or parts of it. IT is perceived here as a broad term to incorporate (1) information systems (databases and processing functionalities), (2) IT infrastructure (e.g. data networks, operating systems, hardware, IT skills), and (3) IT policies (procedures for users and IT managers and IT management, IT coordination, education and support) (see Bharadwaj, 2000; Broadbent and Weill, 1997).

2.2.1. IT integration objectives

According to Giga Information Group (1999), Giacomazzi et al. (1997), Johnston and Yetton (1996), and McCarty (2001), there are three IT integration objectives, which we understand as three different IT integration ambition levels: (1) complete integration, (2) partial integration, and (3) marginal integration (co-existence).

- Complete integration is the most ambitious objective in IT integration, one in which two separate ITs are merged. This objective can be completely infeasible in large and decentralised organisations, but may be chosen in smaller firms.
- Partial integration establishes priorities, based on which the most important processes and systems are first integrated, and the remainder is left to a later stage. This option is appropriate when synergies can be realised in some processes but not in others. For example, newly merged banks may combine their treasury and asset management activities to achieve cost reduction while the core services of delivery and production are kept apart.
- Co-existence tries to keep the two ITs of the merger partners unchanged, and only realizes bridges for data exchange and consolidation where absolutely necessary. A co-existence strategy realises only marginal operational synergies. It may thus not be desirable in the long-term given the high costs for maintaining and bridging two redundant systems.

Table 1
MA and IT integration objectives

MA integration ambition	MA objectives	IT integration objective
High	Absorption	Complete IT integration
Moderate	Symbiosis	Partial IT integration
Low	Preservation	IT co-existence

Certain IT integration objectives will be most appropriate for specific post-merger organisational structures. Table 1 summarizes which IT integration objectives correspond with which merger objectives given the level of integration aimed at.

2.2.2. IT integration methods

Complete IT integration can be realised by four methods (Harrell and Higgins, 2002; Johnston and Yetton, 1996; Table 2): (1) abolishing all IT of both merger partners and replacing it by a completely new IT (renewal), (2) closing down all of IT of one of the partners, and using the IT of the other as the IT for both (take-over), (3) combining the best parts of both ITs as the new standard for the new organisation (standardisation), and (4) co-existence, which keeps everything as it was, though it introduces some (periodic) synchronisation of the redundant systems of both merger partners. Renewal and take over have higher integration ambitions than partial integration, which in turn has greater ambitions than synchronisation.

Renewal involves the designs and realisation of completely new processes, activities and related IT (Gouillart and Kelly, 1995). This strategy is often not very practical because frequently the available time is insufficient, and also the definition of the necessary IT in a merger process can create political strains (Batelaan and Veltman, 2002). However, managers may still opt for renewal if neither of the merging companies possess ITs with the capability to support the new company. This method thus abolishes the IT of the merger partners, A and B, and realizes new IT called C instead (see Fig. 2).

Takeover involves using the IT of one of the merging parties as the new system of the newly formed company. In this strategy, a fast integration is possible but no new processes or systems will be developed. In this scenario, conflicting situations between various parties—often with a preference for their own system—easily arise. Sometimes the chosen system may lack functions that are crucial in the new processes and thus it requires some addition of functionalities to meet the new situation. If these adaptations are part of the IT integration strategy, we refer to it as take-over plus. Takeover (and takeover plus) results in substantial disinvestment and may lead to high resistance from one merger partner, but

Table 2
IT integration modes belonging to IT integration ambitions

	Complete integration	Partial integration	Co-existence
Renewal	Yes	No	No
Takeover	Yes	No	No
Standardisation	Yes	Yes	No
Synchronisation	No	No	Yes

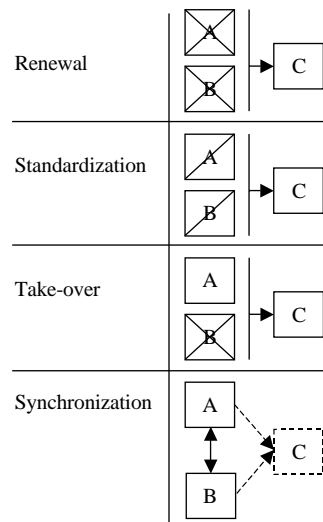


Fig. 2. IT integration methods. A and B is IT of MA partners A and B, respectively. C is the newly created IT.

it may be an appropriate strategy for avoiding the costs of IT redundancy, when aiming at high synergies, or when the IT of one merger partner is superior to that of the other. A precondition for effective takeover, though, is the scalability of the selected system (Batelaan and Veltman, 2002). Takeover and takeover plus thus abolish the IT of one of the merger partner A or B, and the new IT, called C, is equivalent to either A or B.

Standardisation integrates similar IT functions, i.e. only the software packages that support similar business processes across the whole company (Giacomazzi et al., 1997). This is also named a common systems approach, which selects one system as preferred for a certain process without a clear statement of that system being objectively the best. The other existing packages remain operational. Standardisation is often realised by a so-called ‘best-of-breed’ selection procedure. Best-of-breed adapts a mixture of IT, basing the new IT on a combination of the best practices of the two previous ITs. Individual parts from each system are thus combined. This method thus abolishes some of the IT of organisation A and B, and replaces it by a new IT called C.

Synchronisation realises only marginal IT integration since it preserves the original ITs of both organisations, and creates software and hardware bridges to consolidate the data or periodically synchronise the different systems. This method, thus, does not abolish any of the IT belonging to A or B, but does create additional information flows from both ITs to each other, or to a new IT entity called C.

2.3. Organisational and IT priorities and conditions

The two previous subsections have presented theory that argues for the best fit of an IT integration strategy with given merger objectives. The following section will add the organisational and IT contextual factors. These contextual factors may be uncontrollable for the players involved in the IT integration (e.g. the given merger objectives and market

conditions) or they may be controllable for them (e.g. choices on the new systems and procedures) (Stylianou et al., 1996). The first are named conditions and the latter are named priorities.

One of the few publications on these influence factors is Stylianou et al. (1996), which reports about a survey with 1000 questionnaires submitted to CIOs of firms who had a merger during 1989–1991. The 44 valid responses¹ revealed five factors that seem to influence IT integration success (i.e. quality of the integrated systems and the integration process). These factors are (1) the number of experiences with previous IT integrations as a result of a merger, (2) the degree of IS people participating in merger planning, (3) the quality of the merger planning, (4) the criteria used for setting IT integration priorities, and (5) the level of data sharing (and program compatibility) across applications. Another insightful study on IT integration contextual factors (Batelaan and Veltman, 2002) has criticized a few post-merger IT integration myths on basis of these authors' experiences.

1. Myth one states that the development of a new application portfolio is a successful way of uniting the two merging firms. This is often not true, because new application portfolio development results in huge complexity as addition to the complexities of organisational integration. Priority can better be given to the organisational integration (responsibilities, processes, etc.), and the minimally required IT integration.
2. Myth two states that ICT integration is the ICT managers' business. Unfortunately, this often will result in low synergy effects, because ICT managers will defend their own knowledge, systems, and expertises. Consequently, the responsibility for IT integration could better be given to a CEO with IT responsibilities who has to develop a new IT policy.
3. Myth three says that external advisors are able to objectively determine the best solution. External advisors, though, are not always independent or have insufficient notice of the complexities and specifics of the situation at hand.
4. Myth four says that 'Best of breed' is the best solution. Mostly this results in system redundancies and lacking functionalities where needed. The fit with process needs and other existing systems, thus, is not easy to accomplish.
5. Myth five states that a merger is an opportunity to realise a major improvement in the ICT domain. This idea may result in a major increase of decision making efforts and change complexity. Only urgent systems (show stoppers) need to be developed and realised. For less urgent systems, a decrease of system performance may be acceptable for the time being.

Following these practical lessons, post-merger IT integration should be done carefully, taking notice of organisational and IT priorities and conditions. An example of a successful merger is reported by Johnston and Yetton (1996). In a merge of two Australian banks, the first major implementation step in the integration process was to build a (temporary) technical bridge between the two systems (Johnston and Yetton, 1996).

¹ Stylianou et al. (1996) report that 44 valid responses were gained, which corresponds with an 18% response rate. The sample size had to be adjusted for questionnaires that were undeliverable, not applicable, or where a company policy prohibited response.

To retain customers of both banks, integration proceeded carefully, instead of undertaking an immediate radical change. This would secure the customers of either bank to have access to their accounts if they would go to any branch of the newly merged bank during the integration. The technical bridge (realised by periodic synchronisation) provided the necessary connection between the two platforms for capturing and routing transactions, while the systems integration continued in the background.

These discussions of organisational and IT merger ambitions constraining factors can be summarized here.

2.3.1. Conditions

- The business strategy, structure and (work) procedures must be well specified in advance to the IT integration process.
- Keeping the organisation operational during the integration process, and to avoid uncertainty and insecurity among employees and customers. This requires the integration of mission-critical and strategic systems first.
- IT-projects that are conditional to the integration must be working well already.
- The IT integration requires a proper budget, time frame, and IT policy.
- The desired working procedure and operations must be compatible with the capacities and capabilities of the existing IT.

2.3.2. Priorities

- Realising merger results in the shortest time possible. Taking too much time may result in the loss of motivation and resources during the project. If the project time is very limited, the take-over strategy would be favorable, but may result in major problems.
- Retaining the capacities, resources or talents that are at the core of the merger.
- Integrating two IT's often encounters technical and operating logic incompatibilities. The latter is much more complicated because different business processes reflect different operating philosophies, which are quite hard to simply change and combine.
- The different levels in the use and management of IT between the two companies may be an obstacle that must be overcome before integration is possible.

3. Case studies

3.1. Methodological considerations

The previous section has shown that there is not much literature to build a theory of post-merger IT integration, and that much of the literature is explorative (e.g. reporting about surveys) and practice oriented. This makes us very uncertain with respect to the existing knowledge with respect to its completeness and value for researchers. To further develop the theoretical insights on the possible relations among mergers, IT integration

strategies, and merger priorities and conditions, we decided to conduct case studies. Glaser and Strauss (1967), Lee (1989) and Yin (1989) have argued in favor of case studies for theory development. In contrast to case research for grounded theory development (Glaser and Strauss, 1967) and interpretive research (Klein and Myers, 1999), we use the cases as additional experiential sources for explicitly finding additions on the theoretical insights gained from the literature study. This implies that the research design, data collection, and analysis are led by the theoretical insights that have been gained already in the previous section and that we thus do not apply a fully open research strategy. The research, however, does have an open character, because we want to answer the question what variables and theoretical relations should be added to the theory found from the literature study. We even may have to adjust our data collection as we are in the field. This is comparable to a grounded approach because we use case data for theory construction. Our approach, though, is not fully identical to how grounded theory discovery is often understood, because we use literature insights as a lens for systematically approaching the field. Glaser and Strauss (1967), however, state that “Of course, the researcher does not approach reality as a tabula rasa. He must have a perspective that will help him see relevant data and abstract significant categories from his scrutiny of the data” (1967; p. 3, note 3).

Three hospitals in the Netherlands were selected. The Dutch health industry is interesting from a merger perspective, because the government and health insurance firms are ‘forcing’ hospitals to reduce costs and maintain and increase the service levels offered at the same time. The need for hospitals to establish strategic alliances and rethink their organisational borders is also recognised internationally (Spil and Stegwee, 2001). Hospitals are also relevant for this study because of the large IT investments they require, and thus the high complexities that may appear in post-merger IT integrations. We selected three hospitals that vary on the independent variable (merger ambition), and that were willing to participate in the study by interviews and making relevant documents available.

We developed a data collection procedure that aims at checking the usefulness of the ideas behind Tables 1 and 2 by asking CIOs (who according to us should be the most knowledgeable persons with regard to post-merger IT integration practice) about it. More concretely we asked the CIOs how and if they assessed the merger objectives, IT integration objectives, IT integration methods, and the possible relations between them in the decisions that have been made during the IT integration. The CIOs were also asked to provide additional evidence (e.g. information systems plans) concerning their statements. We also had questions (though less structured) concerning the conditions and priorities that influenced the final decisions made. Following our ambition to discover additions to the theory gained from the literature, we paid special attention during the data collection to deviations from what we already knew from the literature. We also maintained openness to facts and evidence that would not be recognized if we would apply the data collection scheme rigidly. This resulted in a partial overlap of data collection and data analysis. Consequently, the existing concepts of Section 2 have been transformed to a scheme for semi-structured interviews with CIOs. See Appendix A for this interview scheme, and how we worked with it in practice.

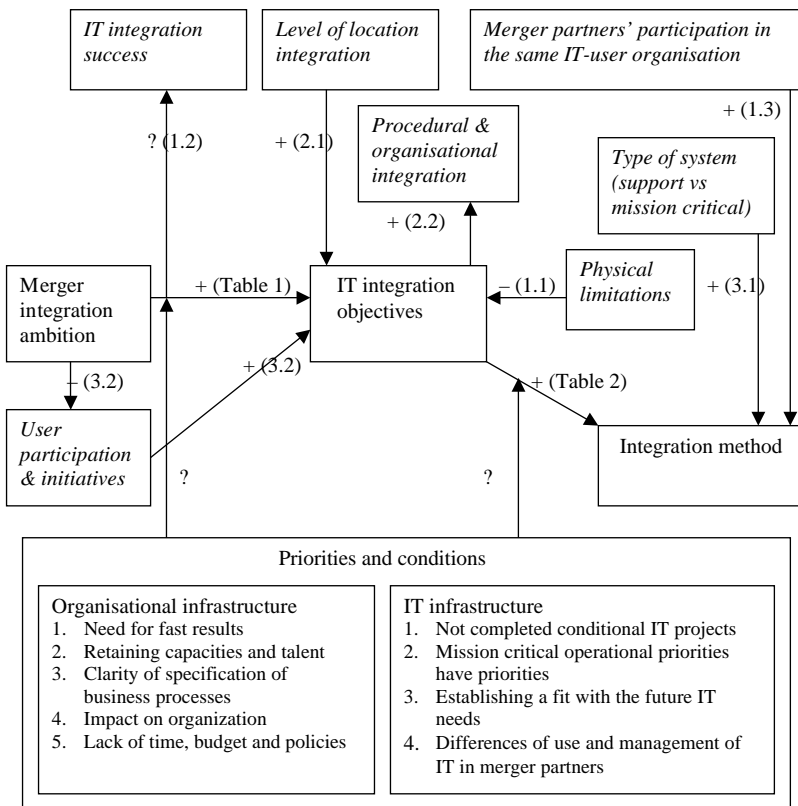


Fig. 3. A causal model for post-merger IT integration research. *Note:* Bold variables come from the literature. Italic variables come from the case studies. Numbers in the relations are gained from the case (see Tables 4–6) For line 1.2, we do not know yet if the relation is positive or negative.

The interviews will be analysed with respect to what insights are consistent or not consistent with Tables 1 and 2, and what new insights can be gained with respect to the priorities and conditions. This is first done for each case separately (see Tables 4–6), and finally the new insights are merged with the causal model of Fig. 3. The literature on grounded theory development has often argued in favor of cross-case analysis (Glaser and Strauss, 1967; Yin, 1989). Although such an approach can result in appreciable results, for our objective of comparing the theory gained from the previous section with what can be observed in a case this is very inefficient.

How we handled validity and reliability concerns in this study is summarised in Table 3.

3.2. Hospital case study A

3.2.1. Introduction

At the beginning of 1991, two private hospitals in the same city decided to merge. There were two main reasons for this, one was that one of the hospitals was in considerable

Table 3

Case study validity and reliability concerns (Yin, 1989: 41) and how this study handled them

Concern	Case-study tactic	How done in this study
Construct validity	Use multiple sources of evidence	Data are collected by CIO interviews, study of documents (esp. information systems plans), and what is gained via informal interactions. Two of the authors are IT and organisation consultants in the health industry and consequently have a high level of informal insights
	Establish chain of evidence	Data from different sources are checked for possible inconsistencies and corroborations
	Have key informants review draft case study report	The CIOs are asked to review our reports and agreed
Internal validity	Compare predictions for a case with empirical data	This is the explicit intention of the case studies, and done in the analysis
	Do explanation building	We analysed the data to further develop the theory to a more extended version resulting in Fig. 3
External validity	Do time-series analysis	This is not done
	Use replication logic in multiple case studies	We expressed our theory of Section 2 in the research design by selecting the three cases on their different values of the independent variable
Reliability	Use case study protocol	We developed a protocol for the data collection and analysis (see Appendix A). The results were discussed in the group (three researchers and two MSc students)
	Develop case study data base	The interviews are taped and transcribed

financial trouble, and the other that both hospitals on their own would probably become marginal or disappear given the increasing attractiveness of a large university hospital in the same town. A major premise behind the merge was that the hospitals would share the same location by 1997, although this ambition was later postponed to 2007. Both hospitals were member of the same association for hospital information systems, implying that they used very similar hardware and software. This should make full integration feasible, and a plan was made to start integrating patient information (the first operational priority) with financial and managerial information to follow later. A fiber optic network was created to facilitate communication between the two locations. One complication was the decision to decentralize the managerial responsibilities in the new organisation since this implied that much of the information systems would have to be replaced by systems that could support the related new procedures. Though people expected simple synchronisation to initially solve the integration needs, renewal was to be taken as the main objective for the longer term. As the two hospitals each have their traditions and culture, complete IT integration (especially in terms of IT organisational matters) has not been realised.

3.2.2. The merger objectives

The objectives of this merger were clearly to create one new hospital out of the two, particularly for financial reasons and to appear more attractive to the market. The full merger, or absorption, will only be realised when the two hospitals share a location.

Due to government procedures this turned out to be a very time-consuming process, such that, for the time being, only a symbiosis strategy has been realised. The two hospitals followed, as a rule, that they would adopt the best processes of each as the standard for the new organisation.

3.2.3. The IT integration objectives

The IT managers seem to have quickly understood the objectives of the merger, and without much hesitation saw that the end result should be complete integration, initially by best-of-breed and later through renewal. The objective of the merger was to create a single new organisation, and this idea was rigidly adopted in the IT integration objectives. This objective is difficult to achieve in one step, and thus a project phasing was developed in which the system with highest operational priority, patient administration, was first integrated. This resulted in partial integration in the short term, later, financial and managerial systems were also integrated.

3.2.4. Fit of merger and IT integration objectives with the theory

There is full agreement with the theory. The hospitals desired absorption and aimed at complete IT integration, although, in the short term, they settled for symbiosis and partial integration. The problems in actually moving to a common location has made complete integration of the hospitals and their ITs impossible. Some local cultures, procedures and systems will remain (also in the IT organisation) until the move to a new location has been realised.

3.2.5. The IT integration method

The two hospitals decided to follow a best-of-breed approach to integration (not only for IT but also for all the other organisational merger topics), but this was inconsistent with their ambition of having the merger coincide with a reorganisation (i.e. decentralisation). Since neither hospital had IT available that would support decentralisation, a renewal approach to integration was required, and indeed later adopted.

3.2.6. Fit of IT integration objectives and integration method

The new hospital first followed the standardisation (best-of-breed) method and later moved to a renewal method. Both methods are consistent with the complete IT integration and merger absorption objectives. Standardisation by best-of-breed was an appropriate choice for the first stage, because it enables the quick fixes required. However, it does mean that the associated investments had only a limited life expectancy as they had to make way for completely new systems.

3.2.7. Priorities and conditions

A very useful benefit was that both hospitals had similar software and hardware through their participation in the same IT hospital association. The high level of integration aimed at was additionally facilitated by the development of hospital IS integration standards which laid down IT criteria for suppliers in developing products that are compatible within and between hospital information systems. This facilitates the integration of locally-chosen systems in a decentralised IT context. Several conditional factors had an influence.

For instance, the lack of any insights into what the new organisational structure should be (especially decentralisation) implied that the choice for the renewal method should wait until increased clarity was achieved in terms of decentralisation. Further, the accommodation situation was a constraint to full IT integration. There were some acute priorities that had to be dealt with first (especially patient data) that absorbed most of the effort in this project, and resulted in several innovations being seen in a longer-term perspective.

3.2.8. Main findings

The case study described how organisational and IT priorities and conditions influence the IT integration strategy. It is interesting to note that, a merger can sometimes also be used to start a bandwagon and realise other ambitions (such as decentralisation), although this complicates the opportunities of using a single method in both the short term and the longer term. An important constraint for full integration is the problem of resolving the accommodation situation. This can sometimes be a very time consuming process (a delay of over 10 years), from which one may infer that a merger and IT integration strategy may be a very lengthy process, and one in which the objectives may easily change. This brings us to a second deviation for the literature findings. The problems of realising planned change have been mentioned before in the IS strategy literature (e.g. [Orlikowski and Hofman, 1997](#)), but the issue has to be reintroduced in the post-merger IT integration process as well. With respect to the IT characteristics, previous collaborations in IT user associations seem to be very favorable in standardisation (not renewal). Limiting one's perspective to only organisation internal matters thus may reduce the feasibility of certain post-merger IT integrations ambitions. The findings of this case are summarized in [Table 4](#).

3.3. Hospital Case B

3.3.1. Introduction

Two hospitals in two different towns (about 10 miles apart) merged at the end of the 1990s, with the objective of achieving synergies. Both hospitals provided similar services and are of similar size.

3.3.2. The merger objectives

The overall objectives of this merger may be best described as symbiosis, i.e. finding and taking opportunities to share resources where possible. Since both hospitals are situated in reasonably large cities (both around 80,000 inhabitants), there is no attempt to achieve full integration and most patient services will remain available at both locations. As such, most synergies will be gained in management and support overheads, rather than on the operational side, although the pharmacies and laboratories merged at a later date.

3.3.3. The IT integration objectives

The management understood that the symbiosis objective is the most appropriate given the locations and market differences. Thus a partial integration objective has been chosen using standardisation method.

Table 4
Summarised findings for Case A

	Merger objective	IT integration objective	IT integration method
Intended merger	Absorption	Complete integration	Standardisation
Realized merger	Symbiosis	Partial integration	Standardisation and development of renewal
Priorities	A reorganisation was added to the MA, thus requiring renewal rather than standardization		
Conditions	Moving to one accommodation was delayed, constraining the opportunities for complete integration (especially with respect to IT policies and procedures). The fiber optic network was an enabler of integration despite the distance between locations. The IT users association participation eased standardisation of systems. The adoption of standards for the industry further eased standardization		
Theory additions	Physical location limitations may sincerely constrain the feasibility of IT integration Realising IT integrations often does not follow planned change scenarios Collaboration in IT user association facilitates the realisation of IT standardisation		

The IT integration objectives are defined as follows: (1) realising economies of scale in IT, (2) improving buying power in relation to hardware, software and consultancy suppliers by acting as a single hospital, and (3) realising emergency backup through compatible systems. This strategy thus aims at partial IT integration. Currently, integration is achieved in the financial information system using SAP software. For the hospital management information system, identical systems have been implemented at the two locations although the data structures and procedures are, as yet, far from standardised. The CIO stated that: ‘the economy of scale objectives were not reached’; that the formal written IT strategy was a ‘constant factor’ in the merger process; and that ‘the IT blueprint was crucial in implementing the merger’.

3.3.4. Fit of merger and IT integration objectives

The findings from this case study are fully consistent with the theory of Section 2: a symbiotic merger and partial integration objective. Such a merger only aims to merge where it is feasible, and this may well be at the level of management and overheads.

3.3.5. The IT integration method

Complete integration and takeover were not options here because these would require significant disinvestment and neither of the two hospitals had a superior IT to the other. These two methods also require substantial process standardisation and reengineering, which was not feasible given the differences in locations and markets of the two hospitals.

A standardisation method was applied, based on the idea of best-of-breed (this is highly consistent with a symbiosis objective). When one of the locations has to replace or renovate a system, a full check is first made so see if the other location already has the required system before suppliers are approached. Integration seems to be ‘waiting on new versions’.

3.3.6. Fit of IT integration objectives and integration method

The hospitals used the IT standardization method to achieve their partial IT integration objectives. This fits well with the symbiosis objectives of the merger.

3.3.7. Priorities and conditions

Some of the infrastructure and software is equivalent in the two locations. This eases standardisation, but does not resolve compatibility problems since different procedures may still exist and be deeply rooted. In explaining the influence of IT characteristics, the distinction between software, hardware, procedures/policies and people may thus be very important. The infrastructure in general is seen as ‘a neglected area’ in the merger process. Since the symbiosis is not very time critical, and mission-critical systems were not selected as the first projects on which to focus, the integration method has a rather relaxed and open nature, although some other development plans, such as office automation, have had to be postponed because of lack of resources and priority. As one of the interviewees said: “They took care of the fiber optic network but forgot to standardise the office automation”. The merger adopts a risk avoidance strategy, only aiming to achieve the more ambitious operational mergers when this is clearly possible, and once all the supportive and managerial systems are fully integrated. Given the fact that the two hospitals will remain at their existing locations and serve their existing markets, any far-reaching standardisation of operational and managerial procedures (and systems) is unlikely.

This case clearly indicates the importance of location differences and their implications for IT integration. The less need for location integration, the less need for a full integration of the IT. Partial integration by standardisation may be sufficient. The case also reveals that IT integration does not by definition imply that organisational (procedural) integration is achieved. A point often neglected.

3.3.8. Main findings

This case behaves strongly according to the patterns expected from [Tables 1 and 2](#), but a few interesting theory additions have been found. See [Table 5](#) for a summary of these findings.

3.4. Hospital Case C

3.4.1. Introduction

Two hospitals, labelled DIK and LOR, located in two different cities about 10 miles apart merged at the beginning of 2000. Hospital DIK is quite large, and hospital LOR is too small to remain independent in the longer term. Initially, the merger was no more than

Table 5
Summarised findings for Case B

	Merger objective	IT integration objective	IT integration method
Intended merger	Symbiosis	Partial	Standardisation
Realized merger	Symbiosis	Partial	Standardisation (best-of-breed)
Priorities	No operational process reengineering. Only standardisation of supportive IT and IT policies		
Conditions	Maintaining location differences because of market differences		
Theory additions	Lower needs for location integration may imply less need for full integration. In that case partial integration by standardisation may be sufficient After realising IT integration an extra effort is needed to also realize the related procedural integration		

a formal and legal event because the managerial board had to be replaced before plans for integration could be made.

3.4.2. The merger objectives

The merger was essentially a legal one, and thus no plans for process integration were made. As such, this is typical of a preservation merger, although this is somewhat strange given the perceived difficulty of LOR in staying independent. In the end, therefore, symbiosis or even absorption may be needed.

3.4.3. The IT integration objectives

Before the merger, plans were already made to merge the patient demographic information systems to a single system. This would be helpful in understanding the patient population and could be helpful as a bridge to many systems (around 20 in number) related to patients (e.g. care systems, diagnostic systems including radiology, and financial systems). Apart from the pharmacy system, the rest of the IT remained the same, and thus IT co-existence objectives were dominant.

3.4.4. Fit of merger and IT integration objectives

The management has not yet progressed beyond a preservation merger objective, and the patient demographic information system project acts as a bridge between existing systems. This fits the theory of Section 2.

3.4.5. The IT integration method

The patient demographic information system project was thought of as a synchronisation of patient data over the many systems. In practice, however, this project

was much more complicated. Nearly, all 20 systems had to be modified to be able to process the patient data, and the various systems had many unexpected interrelationships that had to be changed. The project thus got slightly out of hand, and acquired characteristics of partial integration. Some systems were even fully integrated, for example the pharmacy systems were replaced by a single new system on the initiative of the pharmacists, a common fiber optic network was installed, and one common telephony systems was created. These developments seem to have resulted in an increased interest of work floor employees for further integration initiatives. There is only limited IT integration and, given the lack of managerial guidelines, an incremental approach is followed. System replacement projects tend to favor integrated systems, which leads to problems given the lack of organisational integration. Many replacement projects therefore take much longer than anticipated, or even get stranded in the requirements phase.

3.4.6. Fit of IT integration objectives and integration method

In this case study, the co-existence objectives fit with the synchronisation method, although some systems have already moved on towards integration. In practice, the latter conflicts with the original IT integration objective, and hence with the merger objective, and this gives causes problems in the replacement processes.

3.4.7. Priorities and conditions

Currently, a large number of different systems are in operation at the two locations. Since no clear guidelines exist with respect to what merger objectives are being pursued, no clear new information policy or plan for the whole organisation currently exists, local needs are used as guidelines for future developments. There are some plans for the hospital management information systems as the first follow-up of the patient demographic information project. Given the lack of top down steering, the actual integration is not given much priority, guidelines or support. Initiatives for integration therefore mostly come from the workforce. Since the LOR hospital has substantial problems in surviving, and the merger is thus potentially of the absorptive type, it would make a lot of sense to start the IT integration by prioritising the patient demographic information system. Such a system would lay the foundations for knowing what happens in the operational field in both hospitals, so that a plan could be established for operational redesign. If the hospitals do not want operational mergers, as in Case B, then the focus could be on the partial integration of supportive systems such as the management information system and financial information system.

3.4.8. Main findings

This case has all the characteristics of a preservation-co-existence strategy, though locally there is more of a motivation for realising some operational integration in the future. Lack of management prevents a partial (or complete) integration strategy to develop at the moment. The data and insights gained for this case are summarised in [Table 6](#).

Table 6
Summarised findings for Case C

	Merger objective	IT integration objective	IT integration method
Intended merger	Absorption	Complete integration	Renewal
Realized merger	Preservation	IT co-existence	Synchronisation
Priorities	Managerial guidelines for integration are lacking. Some integration initiatives come from bottom up		
Conditions	Many diverse IT, thus very complex to integrate by synchronization		
Theory additions	In preservation strategies the general IT integration strategy may be coexistence, but for supportive systems it may be partial or complete integration		
	In preservation strategies, local initiatives may be the striving force behind integration. This also implies that room for user participation may be very effective		

4. Conclusions and discussion

As stated in the beginning of the article, we posed the question What IT Integration Strategy fits in the context of mergers? Following Fig. 1, this IT alignment question concerns the following topics:

- Q1. What IT integration objectives are consistent with what type of merger?
- Q2. What integration methods are consistent with which IT integration objectives?
- Q3. What priorities and conditions (IT and organizational processes and infrastructures) influence decisions concerning IT integration strategies (objectives and methods)?

Despite the urgency of the topic, as manifested by several practitioner-oriented publications, we were surprised by the limited number of academic publications in this field, and concluded that there is need for a theory development study. This study has been done by using two different resources, the IS literature and hospital cases, in which the insights gained from the literature study were used to partially structure data collection and to generate further, experience-based, theoretical insights.

The literature study gave arguments for a rather linear relation between the level of merger ambition, and the level of IT integration aimed at (Tables 1 and 2), though, the literature to some extent also suggests priorities and conditions to be mediating variables on these causal relationships. These priorities and conditions influence the actual choices in the relations between objectives and methods for IT integration, such that probably the relations are not linear. In the case studies we found a number of other variables that influence the selection of the IT integration objectives (user participation,

location integration, type of IT, organisational participation in an IT user organisation, physical limitations). The chosen IT integration objectives have influence on organisational integration, and the IT integration success. The case studies gave seven other variables and related propositions that extend the model that came out of the literature study. Fig. 3 summarizes these findings in a causal research model, that may be a useful starting point for further empirical research.

There are a number of reasons of being cautious with respect to interpreting Fig. 3. First of all, given the limited literature in the field, the literature study is still rather limited. Second, the case studies are only about three hospitals in the Netherlands. Not only the number of hospitals makes our findings difficult to generalise, but also the specifics of the health industry (high level of user participation in the IT association, and a strongly regulated market by which mergers are forced up by the government to hospitals if budgetary problems seem to be structural). Because this study is a theory generation study, though, the results should be evaluated from the perspective of their heuristic value. Fig. 3 can have high research relevance because it gives a research model and it is theoretically grounded in the IT alignment paradigm, existing literature and practice. The subject of merger IT integration therefore has become mature for further theory development and testing, though we want to warn researchers for the high level of non-response that may occur from surveys in this field (as was manifest in Stylianou et al., 1996, as well as our own survey), and we also believe that much of the vital dynamics in IT integration is difficult to observe in surveys.

The importance of studying the dynamics of post-merger IT integration came up several times in the case studies. First of all, the planned mergers of cases A and C were not achieved yet, and thus what we have observed there is only at a point in time and one stage in further integration (this is not sure; maybe the hospitals will give up further integration). This implies that longitudinal studies will probably uncover much more of the IT integration practice, resulting in better theory for decision-making. What kind of IT integration strategy will be adopted is highly determined by political processes. This involves studies of norms, values and backgrounds of the decision-makers, emotions, and personal interests, and the power relations between merger parties, which are major elements in any IT strategy formation study (Earl, 1989). Effective policy and strategy formation also require the ability for effective socialisation. This was quite manifest in the three cases. Case A showed that the integration of IT infrastructure (the fiber optic network) was not very complicated for them as both locations were only at a walking distance. The software was rather easy to standardise because of the collaboration in the IT users associations, but most problems existed in integrating the IT policies. Creating an IT policy requires substantial socialisation, which is hard to realise between groups in different locations. Case B aimed at symbiosis. For this purpose IT integration consisted of a jointly approaching of suppliers of hardware, software and services. A joint infrastructure existed only for the data transfer between the supportive systems. Case C had not yet been able to develop a joint IT policy. Consequently, local initiatives had several possibilities (complicating integration in the future?). The patient demographic information system was integrated at the software and infrastructure level. Although this might have been a good idea, it was not supported by an integrated IT policy. This may result in problems and a need of early disinvestments in the future. The general insight

is that software and hardware are rather easy to integrate via the existence of some IT products on the market, but that integration of IT policies and organisational procedures require socialisation processes. An important factor that plays a role in socialisation is the physical proximity of the people who have to socialise, and thus the creation of these IT policy integrations require location conditions among others (Nonaka, 1994).

Finally, we want to emphasize that the avoidance of problems is of the greatest value to practice. In the case of post-merger IT integration, the following preventive measures can be taken:

1. In preparing information systems and processes, one could anticipate a future merger. Mergers are very common nowadays and, as such, IT policies and IT means could be developed that provide the capability of becoming a merger partner with as yet unknown parties without undue problems. This also imposes requirements on the software and hardware industry (like open sources and standardisation).
2. Technology Due Diligence (TDD). Due diligence is generally thought of as a task for accountants and lawyers in a merger process in determining the value of an acquired company. However, since IT underpins the competitive positions of organisations, the use and management of technology by a to-be acquired company merits close scrutiny. TDD is concerned with estimating the worth and value of an acquired company's IT which should form part of the input in determining the price of a deal (Hamscher, 1999).

These two topics are also excellent subjects for academic research. Together with Fig. 3 and our discussion points, we hope that they pave a path for further study in this field.

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Appendix A. Checklist used in the interviews with hospital CIOs

The interviews have been conducted by two MSc students together with two of the authors. Below, you find in bold the wording we used in our interview checklist, and some comments that were created afterwards in italics to explain what actually happened during the interviewing and analysis processes.

1. Identify reasons and conditions of the merger

This is a rather general question for the interviewer and interviewee to get in an informal way acquainted with the context and ambitions of the merger.

2. What merger is applicable to the case?

We realised that vertical (and conglomerate) mergers are not relevant in the current Dutch health industry. Such a merger for instance could involve the merge of a group of general practitioners with specialists in a hospital. The organisational, market, infrastructural, and financial structures for medical practitioners and hospital specialists are so different that vertical mergers are not relevant for our study.

3. What merger strategy has been followed: absorption, symbiosis or preservation? Or other?

This is what we also name the ambition level of the merger.

4. What IT integration strategy has been followed? Identify from the list of Table 1.

5. Compare merger type/strategy and IT integration strategy: do both correlate according to our theory (see Table 2), or are they deviating? What explains possible deviation?

This item is of course not translated into an interview question, but it is an analysis item for the interpretation of the insights gained and for further directing the interview. In the beginning of the study, we were not so very certain about relations between merger ambition and IT integration objectives, although we had some ideas of a possible relation, we wanted to be as open as possible to other patterns that do not fit with the theory of Section 2.

6. What factors have been considered by the management in selecting a preferred IT integration strategy? See Fig. 1 for a quick review of factors, and check factor 1 (merger ambition), factor 2 (conditions and priorities), and factor 3 (specific IT conditions and priorities).

Initially, we were aiming at a decision study and to let the CIOs speak aloud on what factors they take into account for the decisions on IT integration strategies. Later we became aware (also under the influence of the first review round) that we could be more parsimonious in our model and we developed an empirical research model with variables and causal relations. This would enable a more generalised model than an idiosyncratic decision study. Consequently, the concept of decision factors was changed to variables during the analysis.

7. Have other factors been considered?

We wanted to be as open as possible in the collection of categories, variables and relations in the grounded theory we wanted to develop.

8. What priorities did the factors have in the actual decision making concerning the IT integration strategy?

The respondents systematically mentioned the merger objectives first and its translation to realistic IT integration objectives. With realistic is meant what is possible at a certain moment in time with given conditions and priorities (organisational and IT).

9. Has management tried to apply a decision model to systematically identify factors, collecting information, and deciding on the IT integration strategy?

All CIOs responded negatively here, because they had no idea what such a model

should look like. We believed in the beginning that the CIOs would probably be able to list some decision phases for the IT integration process, but it seemed that most of the decision making had a rather short-term problem solving focus. Consequently, we also reduced the ambition of the article to the identification of variables and relations that affect the IT integration strategy instead of a decision making model.

10. If not (with respect to item 9), how did the IT integration strategy come into being?

The given merger objectives seem to have given clear directions to the IT integration objectives. Some idealistic options seem not to be realistic for the moment, and thus the priorities and conditions are important influencing factors of what is actually done.

11. Compare the cases. On what points do they differ most? Explain the difference?

After the data collection, we found that a major rewrite of the theory section was needed. When that was accomplished, we asked for each case what extra insight it delivered compared to what we knew already from the literature. This is finally mentioned in Tables 4–6 and assembled to Fig. 3.

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