

Evaluating Success in Post-Merger IS Integration: A Case Study

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Abstract: Despite the importance of post-merger IS integration to the success of the whole merger, post-merger IS integration literature remains scarce. This paper attempts to synthesise the often implicit or vague definitions of post-merger IS integration success with those provided in the vast body of literature on IS evaluation. As a result, four categories of success issues for post-merger IS integration are proposed: User satisfaction with the integrated software 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.

Keywords: IS Integration, Mergers, Acquisitions, M&A, Success, IS Evaluation

1. Introduction

Today, the number of mergers and acquisitions exceeds even the records of the merger wave in the 1980s, and consequently, more and more firms are facing the challenges of post-merger integration of such things as their operations, personnel, cultures and information systems. Post-merger integration is a gradual and interactive process, in which the individuals from two or more organisations learn to co-operate in the transfer of strategic capabilities. The importance of post-merger integration is derived from the fact that value creation can only begin when the organisations begin to work towards the purpose of the acquisition. In other words, integration is the source of value creation. Besides this, faulty integration is a significant cause of merger failures (Habeck et al. 2000; Haspeslagh – Jemison 1991; Shrivastava 1986), and mergers and acquisitions frequently miscarry. (See e.g. Shrivastava 1986; Thach – Nyman 2001 etc.)

Furthermore, since information systems (IS) are of the utmost importance in the operation of (large) business, a merger or acquisition may not succeed if information systems' planning is inappropriate. Furthermore, potential counter-synergies can be concealed in information systems. (I/S Analyzer 1989; Franck 1990)

All this makes post-merger integration of enterprise systems both a challenging task, and an interesting topic for academic studies. Consequently, several authors recognise the importance of IT in post-merger integration (See e.g. Franck 1990; I/S Analyzer 1989). Nevertheless, after reviewing the 567 mergers and acquisitions (M&A) related articles published in 65 core journals in the 1990s, Parvinen concludes that “- *post-integration management - - enjoy[s] conspicuously little attention*” (Parvinen 2003). Consequently, the literature covering post-merger integration of the IS is also scarce. We examined the titles of the

567 articles on M&A reviewed by Parvinen (2003), and found 18 titles that had some reference to the post-merger integration phase. Out of these, 16 abstracts were found, and only one of them (i.e. McKiernan – Merali 1995) contained the words “Information Systems” or the equivalent. Similarly, e.g. Merali-McKiernan (1993), Stylianou et al. (1996), Mehta-Hirschheim (2004) and McKiernan-Merali (1995) note that the literature on post-merger IS issues is sparse, and furthermore, it has been claimed that the research has been case-specific and anecdotal in nature, and has appeared in practitioners' rather than academic journals.

On the other hand, information systems success is an ambiguous, multi-faceted phenomenon that can be addressed with various measures. In practice, there are nearly as many measures as there are studies. IS success has often been defined as a result or outcome, or a favourable result or outcome. Already defining how this outcome should be characterised, however, or for whom the result should be favourable, is ambiguous. Furthermore, there may exist complicated contextual effects on what is considered favourable or satisfactory (Saarinen 1996, 104-105). Similarly, addressing post-merger IS integration is likely to be equally challenging.

So determining IS success in general is problematic, and so is finding reliable measures for it. Hence, the measures used are often surrogate and criticised for lacking strong theoretical underpinnings. One of the roots of these problems is the fact that IS investments often have corporate-wide, intangible and long-lasting effects. Because of this, quantitative measures and economic evaluation tend to be difficult to obtain and easy to manipulate. (Saarinen 1996, 105. See also: Brynjolfsson – Hitt 1998, 51-52; DeLone-McLean 1992, 61; Goodhue 1995, 1827, Kortteinen et al. 1995, 175 etc.) In fact, “There are no generally

acceptable measures available to quantitatively and objectively assess an information systems' success. Researchers have, therefore, developed surrogate measures based on subjective evaluation approaches." (Saarinen 1996, 116) Attempts to address post-merger success bear out these challenges. Furthermore, the complex and multi-faceted nature of merger processes makes this task even more challenging.

This paper attempts to explore the various aspects of post-merger IS integration success. In order to reach this aim, IS evaluation and post-merger IS integration success are discussed, and a case study is conducted to illustrate the discussion.

The expected results of this study include an in-depth understanding of the multi-faceted concept of success in post-merger IS integration.

2. Addressing success in post-merger IS integration

As explained in Section 1, the literature on post-merger IS integration is scarce. Furthermore, much of this scarce literature does not define post-merger IS integration success, e.g. Buck-Lew et al. (1992), Merali-McKiernan (1993), McKiernan-Merali (1995), Weber-Pliskin 1996, Giacomazzi et al. (1997), I/S Analyzer 1989, Bentley 2002, Mehta-Hirschheim (2004).

At best, post-merger IS integration success is addressed implicitly, stating that IS integration is expected to be carried out within a predefined time-frame, and without disrupting the work of employees or inconveniencing customers (I/S Analyzer 1989, 2; Merali – McKiernan 1993, 111; Kubilus 1991, 34). Problems such as the cost of ineffective integration, ignoring information quality issues in merger planning, the loss of IS expertise and failure to evaluate the alignment of the IS integration with the achievement of corporate and acquisition objectives, are quoted (e.g. Merali-McKiernan 1993, Cossey 1991).

Merali and McKiernan (1993) claim that IS integration processes are typically not formally evaluated, and both executives and academics frequently evaluate acquisition performance and acquisition strategies on monetary criteria in the short-term right after the acquisition. Examples of this include e.g. Cossey (1991), Weber and Pliskin (1996) and Goodwin (1999), who all suggest cost-savings (economies of scale) and synergies (reducing or exploiting redundant capacity) as benefits obtainable from post-merger IS integration.

On the other hand, Cossey (1991) states that, first, any system can be scored on functionality and value to the business, and secondly, systems success depends on the users' perceptions of them. Main and Short (1989) see increased partnership between the IS and general managers as a key result of post-merger IS integration. This partnership includes (1) alignment of the firms' business strategies and IT, (2) better understanding of line managers' information requirements and readiness to manage IS locally, and (3) better determination of future systems needs. (Main – Short 1989, 470-471)

Perhaps the most comprehensive definition of post-merger IS integration success found in the literature was first presented by Stylianou, Jeffries and Robbins (1996), and then further refined by Robbins and Stylianou (1999). Robbins and Stylianou (1999) suggest the following components of success in post-merger IS integration:

- The ability to exploit opportunities arising from the merger,
- The ability to avoid problems stemming from the merger,
- End-user satisfaction with the integration process and integrated system,
- Improved IS capabilities that help support the underlying motives for the merger, and
- Efficiency and effectiveness of resource utilisation during the integration process.

Robbins and Stylianou (1999) elaborate the construct "Improved IS capabilities" further by claiming that successful IS integration can generate a wide range of positive outcomes that support the merger goals. These include:

- enhancing the firm's competitive position,
- shaping or enabling business strategies,
- integrating IS planning with organisational planning,
- contributing to overall organisational financial performance,
- providing integration of related technologies across organisational units, providing corporate-wide information accessibility,
- providing good quality (accurate, useful, timely information),
- managing its own financial performance,
- operating systems efficiently by ensuring system availability, reliability and responsiveness,
- developing systems efficiently and effectively,
- providing adequate end-user support,
- recruiting and maintaining a technically and managerially competent staff, and
- identifying and assimilating new technologies.

The list above provided by Robbins and Stylianou (1999) illustrated the complex and multi-faceted nature of success in post-merger IS integration.

This list, however, as well as all the other literature quoted earlier in this Section fails to make use of the vast body of IS evaluation literature.

In brief, the IS evaluation literature started moving from technical measures such as system response times towards a more user and organization oriented view, with the surge of the first user-satisfaction measures, such as the User Information Satisfaction (UIS) instrument by Ives et al. (1983). The UIS is a measure of user-satisfaction and hence it is subjective, and addresses IS success indirectly. Being one of the best known tools, it offers a standardised measure (results can be compared across different organisations, systems and points of measurement). On the other hand, it has been criticised for such things as insufficient definition of key concepts, weak theoretical underpinnings and a narrow approach. A step towards more sophisticated measurement tools is, for example, the End-User Computing Satisfaction instrument by Doll – Torkzadeh (1988) that includes the constructs of Content, Accuracy, Format, Ease of Use, and Timeliness of the information. Thereafter, attempts such as the Task-Technology Fit model by Goodhue (1995) or the four Main dimensions of IS success (development process, use process, quality of the IS, and impact on the organisation) by Saarinen (1996) aimed at providing a more comprehensive and multi-faceted view of IS success.

In their seminal review of the IS evaluation literature, Smithson and Hirschheim (1998) divide the IS evaluation criteria into Efficiency Zone (doing things right), Effectiveness Zone (doing the right thing), and Understanding Zone. This model, however, does not provide actual success measures and constructs. One of the contributions of the Effectiveness Zone literature is that measuring IS success is context-bound, and different systems and situations require different evaluations (e.g. Smithson-Hirschheim 1998). In post-merger IS integration, for example, a partial integration of operational IS is likely to have very different goals – and hence very different success measures – from a full consolidation of strategic IS. Therefore, it is only feasible to attempt to define central categories of post-merger IS integration success issues and perhaps give examples of these issues. The relative importance of these categories and their contents must then be decided upon for each evaluation situation individually.

Another seminal literature review was carried out by DeLone and McLean (1992). This condenses

IS evaluation literature into an IS Success Model. In a revised version of their model (2003), they also present a set of six categories. First, system quality, information quality, and service quality affect both user satisfaction and use & intended use. These, in turn, are interrelated and yield net benefits. Finally, these net benefits also affect user satisfaction and use & intended use. In the following, the DeLone-McLean (2003) model is discussed with respect to the post-merger IS integration literature and modified to suit this domain.

1. *System quality*: The importance of system quality in post-merger IS integration was noted by Robbins-Stylianou (1999) and Cossey (1991), and Merali and McKiernan (1993) state that integration should not disrupt the work of employees nor inconvenience customers.
2. *Information quality*: The integrated system may provide corporate-wide information accessibility (Robbins-Stylianou 1999), and it should provide accurate, useful and timely information (Robbins-Stylianou 1999, and Cossey 1991).
3. *Service quality*: The integrated IS departments should operate systems efficiently, develop new systems efficiently and effectively, provide integration of related technologies across organisational units, provide adequate end-user support and manage their own financial performance (Robbins-Stylianou 1999).
4. *Use, intended use*: This construct was not mentioned in the post-merger IS integration literature reviewed.
5. *User satisfaction*: The importance of user satisfaction with the integrated system was noted by Robbins-Stylianou (1999) and Cossey (1991). This construct, however, is not without problems in the context of post-merger IS integration. For example, in some cases users are asked to change their well-functioning systems for others, which is likely to cause frustrations, as the adoption of a new system is always troublesome but does not necessarily bring benefits at the level of the individual user. Also, systems integration may translate into more co-ordinated systems that dictate the users' work processes more than before, and this may be considered a drawback by individual users.
6. *Net benefits*: The integrated system is expected to support the underlying motives of the merger. These include enhancing the firm's competitive position (Robbins-Stylianou 1999; Cossey 1991), as well as shaping or enabling business strategies and integrating IS planning with organisational planning (Robbins-Stylianou 1999). Furthermore, post-

merger IS integration may contribute towards overall organisational financial performance by providing possibilities for cost-savings and synergies (Robbins-Stylianou 1999, Merali-McKiernan 1993, Cossey 1991, Weber-Pliskin 1996, Goodwin 1999).

The above list shows that, while the DeLone-McLean (2003) model offers a valuable insight into the components of post-merger IS integration success, it does have some shortcomings. First, the use or intended use was not found to be an important issue in the post-merger IS integration literature. This could perhaps be because this construct has been widely criticised for such reasons as the amount of use is a meaningful measure of success only when the use is voluntary, more time in use does not necessarily give better results. Secondly, the construct *net benefits* seems to be too general and simplistic effectively to embrace the full richness of the phenomenon. Also DeLone and McLean (2003) admit that, in some studies, finer granulation may be necessary. Furthermore, the post-merger IS integration literature provides some further benefits that do not correspond to the DeLone-McLean (2003) model.

First, issues such as the ability to exploit opportunities arising from the merger, and the ability to avoid problems stemming from the merger (Robbins-Stylianou 1999) are too ambiguous to be classified, and they may be related to practically all the categories above, depending on the particular opportunities and problems.

Besides this, other issues include:

- Efficiency and effectiveness of resource utilisation during the integration process (time, money, personnel) (Robbins-Stylianou 1999, I/S Analyzer 1989, Kubilus 1991)
- Recruiting and maintaining a technically and managerially competent staff (Robbins-Stylianou 1999, Merali-McKiernan 1993)
- The learning opportunity to manage better future IS integrations (Merali-McKiernan 1993)

To sum up the post-merger IS integration discussion, and to make effective use of the IS evaluation research to support it, four components of post-merger IS integration are proposed: User satisfaction with the integrated software's system and information quality; Efficient and effective IS integration processes; Efficient IS staff integration; and IS ability to support the underlying motives of the merger. These, as well as the issues pertaining to these categories, are presented in Table 1.

Table 1: Components of post-merger information systems integration success

Post-merger IS integration success component	Issues
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User satisfaction with the integrated software's system and information quality as well as its use	Not disrupting the work of employees, not inconveniencing customers, corporate-wide information accessibility; accurate, useful and timely information
Efficient and effective IS integration management	Efficient and effective use of resources (time, cost and personnel) during the integration processes, effective management policies with regard to project management, change management, outsourcing, etc.
Efficient IS staff integration	Avoiding the loss of key IS people and their expertise; Recruiting technically and managerially competent IS staff; Avoiding problems like: Reduced commitment and disloyalty, Reduced productivity, Motivational problems, Dissatisfaction, frustration, confusion and stress, Dysfunctional behaviour and sabotage, People refusing assignments, Increased absenteeism, Health problems, Power struggles.
IS ability to support the underlying motives of the merger	For example, cost-cutting and exploiting redundancies in the IS function; supporting synergies in production by e.g. better co-ordination of production capacity; supporting new, integrated R&D function; supporting vertical integration and visibility with the supplier/client acquired, etc.

The post-merger IS integration success components presented in Table 1 are illustrated in a case study in the following Sections.

3. Methodological choices

The empirical evidence for this paper was collected as a case study on IS integration in Company X, a manufacturing company that gained its current form through a joint venture of Group A and Corporation B in 1999. A case study was chosen to enable the in-depth understanding of different aspects of post-merger IS integration. The selected case is interesting in this context as Company X chose to pursue deep IS integration in order to co-ordinate better the production capacity between the factories, and to enable better financial reporting. On the other hand, the implementation process has been somewhat complicated, and different problems have been reported in different factories.

The data for the study come mainly from interviews, and was complemented with a short questionnaire, observation and documents. The data were collected both during the pilot phase (Factory F1) and during the actual implementation (the system was implemented in three more factories). The pilot implementation started January 1, 2003,

and semi-structured interviews conducted with 11 interviewees in April 2003. The new enterprise system (ES) was implemented in three more factories on January 1, 2004, and six interviewees gave their opinions in May 2004. The interviewees adequately cover various actors and management levels that were involved in the ES integration processes studied. They included the integration project manager, representatives of top management, user support, users of different levels and the software vendor. With some key interviewees such as the implementation project manager, several interviews were carried out.

A short questionnaire was directed to the end-users in April 2003 and May 2004. 33 and 168 responses were received in 2003 and 2004, respectively. The questionnaire was based on the Motwani et al. (2002) framework on change management in ERP implementation, and Saarinen's (1996) instrument for evaluating information system success, choosing and modifying suitable constructs of each of these. The role of the questionnaire in this study was to provide an efficient way to collect the users' perceptions and opinions to complement the data from the interviews; that is to say, there was no causal model to be tested. The data were completed by observation, and internal company reports. The raw data from the interview transcripts, responses to the questionnaire, field notes and internal company reports were first collected into a case study database consisting of an organised folder structure, and thereafter the data were analyzed according to the classes suggested by the theory. (See: Yin 1984, Yin 1993)

4. Case: company x

4.1 Research environment

The empirical evidence for this paper was collected from the enterprise systems (ES) integration in Company X, a manufacturing company that gained its current form in 1999 through a joint venture between Group A and Corporation B, in which one of Corporation B's factories (Factory F1) became part of Company X. Company X chose to pursue deep IS integration in order to better co-ordinate the production capacity between the factories, and to enable better financial reporting.

The production function asked for information systems integration as soon as the decision to go ahead with the merger was made. Tailored software was chosen, as it was thought to better support the new company structure. Implementing the new system started on January 1, 2003, three years after the merger took place. The new infor-

mation system consists of sales applications, manufacturing applications, inventory and supply applications, cost accounting and financial reporting. However, accounting functions such as accounts receivable and payable, asset accounting, book-keeping etc., as well as human resource management applications, are not run in the new, integrated system because Group A administers them centrally.

According to the deal, the vendor delivered the software three years after Company X was formed. During this first phase, it was implemented only at Factory F1. Three other factories implemented the software the following year, and implementation at a fifth factory was postponed by one year because of problems with software quality.

4.2 Findings: post-merger IS integration success in Company x

4.2.1 *User satisfaction with the integrated software's system and information quality*

One year after the first installation and five months after the installation in the other factories, the operative functions were using the system, but its use was not trouble-free. The system was up and running and, as one interviewee put it: *"Despite all the trouble there has not been any order that we wouldn't have been able to deliver"*. The end-users, however, were highly dissatisfied with the system and its usage. One of the interviewees commented: *"We have reached a satisfactory level of know-how in using the system. However, the system has not fulfilled the hopes and expectations we had [with regard to quality]."* The results of the end-user survey supported this view: 61% of the respondents felt that the system was slow, and only 11% almost or totally agreed that the system was fast (N=168). Furthermore, only 26% of the respondents totally or almost agreed that the system was being used successfully whereas 47% held the opposite view (N=167).

4.2.2 *Efficient and effective IS integration management*

In Company X, post-merger IS integration took a relatively long time since the new enterprise was programmed from scratch. Before the merger, both factories were using proprietary enterprise systems, tailored by different domestic software vendors. Neither of these systems, however, was thought to have the properties necessary to support the new company, and there were no new versions available of either software. Consequently, Company X chose to develop a tailored

integrated system in order to gain a strategic competitive advantage. Due to the time required for programming new software from scratch, Company X could only start implementing the new system on January 1, 2003, three years after the merger took place. This time span, however, was planned and accepted by the decision makers.

As explained before, economies of scale were sought in production, not in the IS function. In fact, the IS integration turned out to be a significant investment for Company X. The budget for this investment was exceeded by 10-15%.

Implementation was carried out within the planned timeframe with the exception of the fact that in the fifth factory it had to be delayed. The implementation team was relatively small, and hence, their time was consumed in training and solving daily problems. There was therefore insufficient time to test the critical software modules that were to be used in that factory, as their quality did not meet the expectations of Company X. Finally, the quality of these modules was not thought to be up to standard, and the implementation was postponed.

As the implementation team was occupied with daily issues, not enough time was left for strategic planning and efficient managing of the software vendor. No formal project management tools or techniques were used, as only major steps such as go-live dates were formally tracked. Managing the vendor relationship was complicated despite the close relationship with the vendor. A database for communicating with the vendor was only established more than six months after first implementation. On top of this, their first formal and extensive evaluation of the project was a side project of this study, and only the project manager initiated the second evaluation.

With regard to users' perceptions on managing the change, 49% of the respondents totally or almost disagreed with the statement that the implementation and the change related to it were well managed, whereas 20% totally or almost disagreed, and 25% were indifferent (6% didn't know, N=166). Also related to this, the interviewees frequently reported that user involvement in the requirements engineering phase was not sufficient. On the other hand, the interviewees emphasised the efforts made with user training, and the users were pleased with the quality of the user support. Moreover, the changes required in different factories were different. The project manager claims that these differences have been taken into account during IS integration, as the individual sites have been allowed to maintain their particular features, as long as the system and the overall merger goals permit it.

4.2.3 Efficient IS staff integration

In the case of Company X, none of the typical merger-related problems stemming from lay-offs, such as corruption of morals, stress and losing key IS workers was encountered, as there was no need for staff reduction. Instead, a few extra people were recruited to participate in the extensive end-user training programmes.

According to the first plans, the new system was only meant to be implemented in the pilot Factory F1, and an implementation project manager was appointed from Factory F1. Later on, it was decided that this software was to be used to run the whole company, and the implementation project manager now faced a larger-scale, more complex implementation project than he had originally accepted. Besides the project manager, the implementation team consisted of IS professionals from both Factory F1 and other factories belonging to Company X, and the team was supported by Group A's IS department. Issues such as the lack of formal project management and problems with managing the vendor, showed that the implementation team needed more support and expertise in these areas, at least at the beginning of the project.

4.2.4 IS ability to support the underlying motives of the merger

The motive for this merger was the fact that machinery was getting old both in Group A's factories and in Factory F1, and heavy investments were required. This, in turn, would have created a huge over-capacity in the market, and therefore Group A and Corporation B decided on the joint venture. Related to this, and in order better to co-ordinate the production between the different factories, Company X pursued full consolidation of the enterprise systems. That is to say, synergies were sought in production, not in the IS function. Despite the bugs, the system supported the operations, and clear benefits such as better control and co-ordination of resources between the factories were realised.

Furthermore, when Company X was formed, the management of the company concluded that Factory F1 – that used to belong to Corporation B – had more efficient processes. Hence, they decided to implement these processes in the other factories. Before starting to implement the new software, however, these attempts met with little success. This illustrates the reactive and proactive roles of IS integration. First, IS integration has a reactive role in the sense that it follows the overall post-merger integration strategy. On the other hand, it has a proactive role in the sense that it is

used to implement changes in company processes.

5. Summary and concluding remarks

Sections 1 and 2 of this paper show that, first, post-merger IS integration literature is scarce and secondly, most of this literature does not define success in post-merger IS integration at all. The definitions provided are often implicit or vague, the only exception being the papers by Stylianou et al. (1996) and Robbins-Stylianoi (1999). Furthermore, none of this literature manages to exploit the vast body of literature on IS evaluation.

Much of the IS evaluation literature is summed up in the DeLone-McLean models (1992, 2003). This paper compares the success issues proposed by the post-merger IS integration literature with those presented in the DeLone-McLean model (2003). As a result, four categories of success issues for post-merger IS integration are proposed: User satisfaction with 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.

Issues pertaining to each of these categories were observed in the illustrative case study presented in this paper. The case study also demonstrates some of the complex interrelationships between the success issues and categories. For example, an insufficient number of IS personnel combined with somewhat inefficient IS integration management aggravated the system quality problems as observed by the users. Furthermore, low system quality caused dissatisfaction among the users, however, the system functions well enough to support the new processes and the coordination of production capacity between different factories – i.e. the underlying merger goals.

Further studies are recommended, first to study these interrelationships in more detail, and secondly to provide more comprehensive lists of success issues related to different types of merger goals.

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