GUEST EDITORIAL

Information system integration in mergers and acquisitions: research ahead

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The broad aspiration of this special issue was to build upon, and contribute to, an emerging stream of research addressing information systems (IS) integration in the context of corporate mergers and acquisitions (M&A). There is little doubt that the topic has significant implications for the IS discipline, in terms of both practice and academic scholarship. From a practical standpoint, M&A is an activity frequently seen around the globe, with the financial value of completed deals in 2013 alone being around US$ 2.3 trillion. Indeed, M&A is part of many corporate strategies to save costs, and to achieve diversification, market growth, elimination of competitors, and synergy. Unfortunately, in practice, many M&A initiatives fail to deliver on their promises and evidence of failures abound in the literature. For example, Haleblian et al (2009) found that only 30–40% of all M&A in the private sector create financial value for its shareholders. Literature also indicates, that in most cases, M&A lead to destruction of value both in the short or long term (Tanriverdi & Uysal, 2011). One important factor in explaining the high number of failures in corporate M&A is IS related issues (Giacomazzi et al, 1997), specifically, lack of effective integration of IS. In fact, lack of IS integration has been cited as being the third most important reason for M&A failure. On the other hand IS integration capabilities, if managed well, can lead to the realization of the economic benefits in M&A (Benitez-Amado & Ray, 2012). Indeed past research has argued that around 45% of the expected benefits from an M&A are directly dependent on effective IS integration (Toppenberg & Henningsson, 2013).

Given the emerging recognition of the role of IS in M&A, there is need for deeper understanding and empirical examination of IS and M&A linkage. There is a body of work that has started to explore IS integration in the context of corporate M&A. Some of the findings relevant to the IS discipline include the recognition of the importance of IS integration during mergers (Buck-Lew et al, 1992; McKiernan & Merali, 1995), factors that contribute to the likelihood of successful integration (Stylianou et al, 1996; Robbins & Stylianou, 1999), such as IS integration strategy (Henningsson & Yetton, 2013), the importance of learning and experience (Haleblian & Finkelstein, 1999; Henningsson, 2008), the need for integration methods and tools (Alaranta & Henningsson, 2008; Henningsson & Carlsson, 2011), and the need for alignment between IS strategy and the M&A strategy (Wijnhoven et al, 2006; Mehta & Hirschheim, 2007; Baker & Niederman, 2014). This literature served as the backdrop for this issue.

In this special issue

We present five papers that contribute to the body of knowledge on IS integration and M&A. These papers provide distinct and complementary contributions to the field, including models explaining: serial acquirers' abilities to undertake IS integration, how industry context explains success and failure for shareholders, how environmental and organizational contexts influence the process of designing a common platform in post-mergers,

the role of time to capitalize the synergetic benefits, and innovation knowledge influence post-merger innovation performance.

The first paper presents a case study of a serial acquirer in which Henningsson investigated how IS integration experiences from one M&A to another M&A are critical for future success. The study is based on a study of Trelleborg – a Swedish manufacturing firm – and four of its acquisitions and IS integration projects. The paper develops a knowledge-based model that explains the building of organizational knowledge for IS integration. The model includes, five propositions that are based upon the following mechanisms: routine refinement, superstitious learning, expertise building, sub-activity refinement, and related expertise building. The two last mechanisms are new to the literature and suggest that knowledge relevant for IS integration may come from the experiences from other IS projects or related activities. The knowledge-based model and the five propositions explain differences in acquirers' abilities for IS integration through the building of knowledge over a series of acquisitions.

The assumptions that the acquirers' first objective is to integrate IS resources with its own and that IS integration in M&A is assumed to lead to synergies is challenged in the second paper. Tanriverdi and Uysal investigate and argue that that IS integration does not always lead to synergy and value in M&A. Their starting point is that prior research on vertical integration has shown that IS resources are not scale free, that is, these resources are not easily transferred from one company to another company, or if they are, the costs are high. This is also one of the explanations for why IS integration tends to fail in M&A. To understand why IS resources or capabilities are not easily transferred, why differences in acquirers and targets IS creates resources management issues, and why IS integration in M&A does not create value for the shareholders, the authors draw upon corporate control theory and theorize about the factors that explains the role of IS resources in M&A. They test their hypotheses on a sample of 549 M&A transactions between 1998 and 2007 and find that, on average, capital markets react negatively to M&A announcements of acquirers whose IS resources are superior relative to those of the targets. This indicates that if the target IS resources are perceived as inferior, then the acquirer will apply a rip and replace strategy in the IS integration and disrupt the target's operations and revenue growth. They also find contradictory evidence. For instance, if the acquisitions occurs in the same industry, then the rip and replace strategy is perceived as positive from a market value perspective, since both firms have similar operation practices. The findings indicate that the success of IS integration is contextually dependent.

The next paper, by Jain and Ramesh, is a field study that highlights a number of issues when developing a common platform after the merger of two companies. Given the difference in the type of products that the two organizations produce, some of their processes, such as procurement, are understandably different. The business challenge is to develop a common platform that supports both business units. The authors develops a framework, based on platform and boundary spanning literature, that shows how environmental and organizational factors shape the process of common platform development. A central finding is the role of the negotiation process between the business units and the importance of negotiations among the units.

The fourth paper, by Busquets, is an in-depth case study of the Spanish bank Santander Group and its acquisition of Abbey – a British bank. Discovery paths, based on evolutionary theories, is the core concept in this paper. Paths are a set of transformations that resolve problems and the ability to up-scale them. In this case it is about becoming a more customer-centric by transferring the IS platform, Partenon. In the beginning, Santander Group achieved synergies based on economies of scale and scope in the short term (2004–2006). Over time, the discovery path led to emergent synergies based on new businesses and new organizational structure. For instance, IS development and IS distribution were changed after the implementation of Partenon. These changes enabled Santander Group to bridge IS and business, thereby creating a more agile business.

In the final paper, Datta and Roumani pose the question: Do acquisitions lead to instrumental innovations related to the acquired knowledge? They build upon ideas from literature on vertical integration that suggests that knowledge gained from acquisitions could lead to innovation performance. They present a comparative case study of Google and Yahoo and examine how acquired knowledge impact post-innovation performance (measured by time-to-patent). The authors analyze the relative success as a hazards model. The results from the study point to Google's ambidexterity over Yahoo with a faster and more systematic pace of innovation measured by terms of patent and the release of new applications from acquisitions.

Research ahead

The five papers illuminate different aspects that relate to IS integration in corporate M&A. Building upon the papers and the existing literature, we develop a number of future research questions. The first relates to IS integration and how to develop this field. The second area relates to the M&A context of IS integration. Finally, we address the different stakeholders involved in the integration of IS in M&A.

IS integration

The focus of this special issue was on IS integration in corporate M&A. IS integration refers to the creation of some sort of linkage between two or more previously separated ISs (Markus, 2000), which has great relevance in determining M&A success (Benitez-Amado & Ray, 2012). Bidan *et al* (2012) propose four approaches to achieve IS integration, including Data warehousing, Enterprise Resource Planning (ERP) systems, Enterprise Application Integration

re-architected systems, and application programming interface. The degree of linkage can be differentiated between loose and tight integration (Themistocleous & Irani, 2002). Massetti and Zmud (1996) offer a more elaborate conceptualization of IS integration, viewing it as a four-dimensional construct that could be measured by volume, breadth, diversity, and depth. The sub-constructs of the IS integration concept relate to how the literature differs among types of systems. For instance, Weill & Broadbent's (1998) classify IS based on the organizational process they support, including infrastructural, transactional, informational, and strategic systems, as they present fundamentally different characteristics with respect to integration. Despite the acknowledged relevance to integration, the literature on IS integration remains under-developed (Henningsson, 2008), even though Europan Journal *Information System* had a special issue edited by Themistocleous & Watson (2005), and a number of core questions arise. First, how do we conceptualize IS integration and theorize about it beyond technical approaches? Second, what kind of measures of IS integration are needed when addressing M&A issues? Third, how are integration projects run and what methods are used in M&As? Fourth, are different IS, such as infrastructural, transactional, informational, and strategic systems, managed differently during the M&A?

IS integration is accomplished through different integration strategies. Henningsson & Yetton (2013) propose three integration strategies in M&A: IS absorption, IS co-existence, and IS renewal. The first strategy is the 'rip and replace' strategy where the target's systems are replaced by the acquirer's systems. In the second strategy, some parts of the target's IS are retained for different reasons, such as superior to acquirers' systems or legal requirements. This strategy requires some form of technical linkage between the acquirer's IS and the target's IS. This can be realized in through several approaches as outlined by Bidan *et al* (2012). The third proposed strategy is IS renewal. Basically, as part of this strategy, a new IS is acquired, either through in-house development or buying off-the-shelf on the market. There is also a fourth strategy that is a strategy of IT non-integration, as part of M&A. This strategy is applicable in cases of acquisitions where the acquirer has no intention to integrate the target firm. This is not only a common strategy applied by private equity firms, but also used smaller business units in a large acquisition that are to be sold off. Future research questions that can advance this overall area include: What are the conditions that lead to different integration strategies? How does the competence level of target firms' IS resources influence the choice of IS integration strategy? What methods are used in the implementation of different IS integration strategy? Do these methods differ from traditional IS development methods?

Mergers & acquisitions

M&A is the context of the special issue. The realization of IS integration is, in most cases, a consequence of the M&A strategy (Wijnhoven *et al*, 2006; Mehta & Hirschheim,

2007). We can see a spectrum of M&A that involves total integration with limited trace of the target firm, except maybe for knowledge, human resources and capital assets, to no integration at all, where only the ownership has changed. The M&A strategy chosen has large implications, since they are fundamentally different and will affect the IS integration strategy. This raises a set of research questions: How does the M&A strategy influence the IS integration strategy? How does the role and structure of acquires and targets IS department differ between M&A strategy. What is role of consultancy firms in different M&As?

The industrial context needs to be taken into consideration (Tanriverdi & Uysal, 2011). Industries are different and take on characteristics that make them look like institutions (Chiasson & Davidson, 2005). The institutional context, that is, the embedded logic, norms, standards, and values of an industry, often presents significant challenges for M&A projects (e.g., Du, 2013). For instance, in the oil and gas industry, one ERP system has become the *de facto* standard, since all major corporations need to share data extensively in the same format (Hedman, 2003) – this is not the case in most other industries. Research in M&A has generally focused on banking and manufacturing industries (Toppenberg & Henningsson, 2013). This is also evident by the respondents in large scale surveys, see for instace Benitez-Amado & Ray, 2012). Consequently, most of the insights and theoretical contributions related to M&A and IS integration research is applicable to those industries. However, the software industry (in broad terms, from business software, personal IS, to leisure software, such as games) is emerging as one of the bigger M&A sectors (e.g. Microsoft's acquisition of Nokia mobile and King, the game developer). Furthermore, part of the media industry, in particular TV streaming is converging with the content part of the software industry. The software industries' business logic is different from manufacturing. While manufacturing is based on value chain logic, the software industry is based on two-sided market logic (Rochet & Tirole, 2003). Synergy might not be the core driver of M&A in this industry. Instead, it might be market share or the number of customers/members that drive M&A in order to achieve network effects. This ought to be reflected in the theories developed and used to understand M&A and integration. For instance, digital infrastructure and information economics theories might be a path to explore. Research questions that may be pursued include: How do industry characters influence the IS integration? What are the characteristics of software industry M&A? What is integrated in software industry M&A? Is it knowledge, customer base, or offerings? Or, are the acquisitions about killing of potential competitors or making sure that no one else acquires the target?

Stakeholders in IS integration and M&A

This leads us to the perspective taken in these studies. There are many different stakeholders involved in M&A and IS integration. Most studies take an acquirer's

perspective. Examples of this are those studies that aim to identify factors that determine the success of an M&A. Other studies focus on the organization in being, that is, the acquirer and the target. This perspective is evident in many of the case studies. A third perspective, not very frequently seen, is that of the target. In addition, there are those firms that sell business units to acquirers. Another stakeholder is sometimes referred to as carve-outs (Fähling et al, 2013), which become relevant in the study of disintegration of IS, which is not frequently studied (exceptions include Fähling et al (2013) and Leimeister et al (2012). Some questions for future investigation include: What methods are used to disintegrate IS? Consider, for instance, the recent carve-out of Nokia Mobile that Microsoft acquired. How is this process planned? What are the strategies for IS disintegration? Yet, another stakeholder perspective rarely investigated is that of consultancies. They support the acquirers during the M&A process, and in many cases, actually staff the integration or disintegration projects. What are the precise roles these consultancies play, and which roles are helpful or dysfunctional? How do consultancies transfer knowledge between projects and industries?

Conclusion

Given the indubitable finding that integration of IS is critical for the success of M&A initiatives and that a large part of the synergies sought through M&As are directly related to IS integration; it is remarkable that we have not engaged in more research on the topic. We offer five papers that we believe significantly contribute to the understanding of IS integration in corporate M&A. Needless to say, the special issue only represents a start, and much remains to be done to advance theory and practice in this area.

References

ALARANTA M and HENNINGSSON S (2008) An approach to analyzing and planning post-merger IS integration: insights from two field studies. *Information Systems Frontiers* **10**(3), 307–319.

BAKER EW and NIEDERMAN F (2014) Integrating the IS functions after mergers and acquisitions: analyzing business-IT alignment. *The Journal of Strategic Information Systems* **23**(2), 112–127.

BENITEZ-AMADO J and RAY G (2012) Introducing IT-enabled Business Flexibility and IT Integration in the Acquirer's M&A Performance Equation. In the 33rd International Conference of Information Systems, Orlando, FL.

BIDAN M, ROWE F and TRUEX D (2012) An empirical study of IS architectures in French SMEs: integration approaches. *European Journal of Information Systems* **21**(3), 287–302.

BUCK-LEW M, WARDLE CE and PLISKIN N (1992) Accounting for information technology in corporate acquisitions. *Information & Management* **22**(6), 363–369.

CHIASSON MW and DAVIDSON E (2005) Taking industry seriously in information systems research. *MIS Quarterly* **29**(4), 591–605.

DU K (2013) *Information Technology and Corporate Acquisitions*. The University of Texas at Austin, Faculty of the Graduate School.

FÄHLING J, LEIMEISTER JM, YETTON P and KRCMAR H (2013) Managing an IT carve-out at a multi-national enterprise. *Journal of Information Technology Teaching Cases* **3**(2), 106–110.

GIACOMAZZI F, PANELLA C, PERNICI B and SANSONI M (1997) Information systems integration in mergers and acquisitions: a normative model. *Information & Management* **32**(6), 289–302.

HALEBLIAN J, DEVERS CE, MCNAMARA G, CARPENTER MA and DAVISON RB (2009) Taking stock of what we know about mergers and acquisitions: a review and research agenda. *Journal of Management* **35**(3), 469–502.

HALEBLIAN J and FINKELSTEIN S (1999) The influence of organizational acquisition experience on acquisition performance: a behavioral learning perspective. *Administrative Science Quarterly* **44**(1), 29–56.

HEDMAN J (2003) *On Enterprise Systems Artifacts: Changes in Information Systems Development and Evaluation*. Lund University.

HENNINGSSON S (2008) *Managing Information Systems Integration in Corporate Mergers and Acquisitions*. Lund University.

HENNINGSSON S and CARLSSON S (2011) The DySIIM model for managing IS integration in mergers and acquisitions. *Information Systems Journal* **21**(5), 441–476.

HENNINGSSON S and YETTON P (2013) Post-acquisition IT integration: The sequential effects in growth-by-acquisition programs. In 24th Australasian Conference on Information Systems (ACIS), RMIT University.

LEIMEISTER JM, BÖHM M and YETTON P (2012) Managing IT in a business unit divestiture. *MIS Quarterly Executive* **11**(1), 37–48.

MARKUS ML (2000) Paradigm shifts – E-business and business/systems integration. *Communication of the AIS* **4**, art 10.

MASSETTI B and ZMUD RW (1996) Measuring the extent of EDI usage in complex organizations: strategies and illustrative examples. *MIS Quarterly* **20**(3), 331–345.

MCKIERNAN P and MERALI Y (1995) Integrating information systems after a merger. *Long Range Planning* **28**(4), 4–62.

MEHTA M and HIRSCHHEIM R (2007) Strategic alignment in mergers and acquisitions: theorizing IS integration decision making. *Journal of the Association for Information Systems* **8**(8), art 8.

ROBBINS SS and STYLIANOU AC (1999) Post-merger systems integration: the impact on IS capabilities. *Information & Management* **36**(4), 205–212.

ROCHET JC and TIROLE J (2003) Platform competition in two sided markets. *Journal of the European Economic Association* **1**(4), 990–1029.

STYLIANOU AC, JEFFRIES CJ and ROBBINS SS (1996) Corporate mergers and the problems of IS integration. *Information & Management* **31**(4), 203–213.

TANRIVERDI H and UYSAL VB (2011) Cross-business information technology integration and acquirer value creation in corporate mergers and acquisitions. *Information Systems Research* **22**(4), 703–720.

THEMISTOCLEOUS M and IRANI Z (2002) Novel taxonomy for application integration. *Benchmarking: An International Journal* **9**(2), 154–165.

THEMISTOCLEOUS M and WATSON E (2005) Making enterprise systems work. *European Journal of Information Systems* **14**(2), 107–109.

TOPPENBERG GN and HENNINGSSON S (2013) An introspection for the field of IS integration challenges in M&A. Proceedings of the 19th Americas Conference on Information Systems, Chicago, Illinois, August 15–17.

WEILL P and BROADBENT M (1998) *Leveraging the New Infrastructure*. Harvard Business School Press, Boston.

WIJNHOVEN F, SPIL T, STEGWEE R and FA RTA (2006) Post-merger IT integration strategies: an IT alignment perspective. *The Journal of Strategic Information Systems* **15**(1), 5–28.