INTRODUCING IT-ENABLED BUSINESS FLEXIBILITY AND IT INTEGRATION IN THE ACQUIRER’S M&A PERFORMANCE EQUATION

Completed Research Paper

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Abstract

Though mergers and acquisitions (M&A) are a common strategy to reduce costs and pursue growth, the variance in returns from M&A is very high. This research explores how information technology (IT) affects firms’ ability to sense and seize M&A opportunities and assimilate acquisitions. Using a combination of secondary as well as matched-pair survey data from 100 mid-size Spanish firms, the empirical analysis suggests that through the development of business flexibility and IT integration capability, a flexible IT infrastructure enables firms to pursue M&A opportunities and facilitates the integration of IT and business resources of the merged firm, to help realize the economic benefits of M&A activities.

Keywords: IT infrastructure flexibility, business flexibility, IT integration capability, M&A, dynamic capability
Introduction

Mergers and acquisitions (M&A) activity is perceived by top executives and firms as an important mechanism to realize cost savings and growth opportunities (Schoenberg 2006). M&A allow firms to achieve cost-based synergies through economies of scale and scope. M&A also enable firms to achieve revenue-based synergies by leveraging core competencies (Capron 1999). The value generating potential of M&A explains the number and size of M&A deals (Cartwright and Schoenberg 2006). However, a large body of evidence suggests that there is significant variance in the returns generated from M&A (Jensen 1988). King et al. (2004), for example, find that M&A activity has a positive impact on acquirer’s performance in the short-term, no effect in the medium-term, and a negative impact in the long-term.

Prior research has focused on the identification of internal and external variables that may explain the variance in post-M&A performance. The set of antecedents analyzed include cost savings and market coverage capabilities (Capron 1999), knowledge transfer practices (Ahuja and Katila 2001), resource sharing (Capron and Pistre 2002), acquirer’s prior M&A experience (Hayward 2002), level of integration and knowledge codification (Zollo and Singh 2004), complementarity of firm resources (King et al. 2008), and business strategy and environmental uncertainty (Haleblian et al. 2009). Prior research has, however, not paid much attention to the possible role of information technology (IT) in creating value from M&A (Tanriverdi and Uysal 2011). This omission is surprising as IT capabilities have emerged as a strategic imperative for contemporary firms (Tippins and Sohi 2003).

IT may provide the business flexibility to discover and seize M&A opportunities before competitors. Similarly, resource redeployment is a key goal in M&A (Capron et al. 2001). IT may enable firms to redeploy information and knowledge assets such as customer base and process innovations and help to derive value from M&A (Swanson and Ramiller 2004). However, though practitioners seemed to have recognized the importance of IT in integrating targets and realizing value from M&A (e.g., Blatman et al. 2008), academic research has largely ignored the role of IT in M&A (Tanriverdi and Uysal 2011).

To examine the role of IT in M&A, this study examines the following research questions: (1) does IT influence the development of business flexibility to sense and seize M&A opportunities, (2) do IT and business flexibility affect the development of post-M&A IT integration capability (in short, IT integration capability) to assimilate acquisitions; and (3) does IT integration capability affect acquirers’ post-M&A performance? Drawing on the resource-based and dynamic capabilities theories (Barney 1991; Teece 2007) and the perspective of IT-enabled organizational capabilities (Tippins and Sohi 2003), this paper posits a model in which IT infrastructure flexibility enables the development of business flexibility and IT integration capability that help in the search, selection, and assimilation of M&A opportunities. We test the model using variance-based structural equation modeling (SEM) with a combination of secondary data, and survey data from two key respondents in 100 mid-size Spanish firms. The findings indicate that IT infrastructure flexibility facilitates the development of business flexibility and IT integration capability, where IT-enabled business flexibility helps firms to sense and seize M&A opportunities, and IT integration capability helps acquirers to assimilate acquisitions and improve their M&A performance.

Theory and Hypotheses

Dynamic capabilities are a firm’s ability to purposefully build, integrate, and reconfigure its resource base (Eisenhardt and Martin 2000; Helfat et al. 2007). The resource-based and dynamic capabilities theories provide the valuable frameworks to conceptualize IT infrastructure flexibility, business flexibility and IT integration capability, and to link these constructs to M&A activities and post-M&A performance.

IT Infrastructure Flexibility, Business Flexibility, and M&A Activities

IT infrastructure is a firm’s shared set of technical and human IT resource infrastructures that provide the foundation on which specific IT applications are run (Weill et al. 2002). The primary constituents of IT technical infrastructure include computing platform (hardware and operating systems), communication networks, data, and IT applications (Duncan 1995). IT human infrastructure refers to the skills of the IT personnel. Flexibility of IT infrastructure is the capability of the infrastructure to adapt to environmental changes.
changes by enabling rapid development and implementation of new IT applications (Byrd and Turner 2001a). IT compatibility, IT connectivity, modularity, and IT personnel skills flexibility are the key characteristics that make a firm’s IT infrastructure flexible (Byrd and Turner 2001b). IT compatibility is the capability to share any type of information (e.g., text, audio, video, image, etc.) across any IT component throughout the firm (Duncan 1995). IT connectivity is the ability of any IT component to communicate or be connected with any of the other IT component, inside or outside the firm (Byrd and Turner 2000). Modularity is the capability to reconfigure (i.e., add, modify, or remove) and reuse IT components with ease and without any major overall effects (Duncan 1995). IT personnel skills flexibility refers to the business and technical skills of IT personnel, such as the ability to learn new information technologies, interpret business problems and develop appropriate IT solutions, and to work effectively in cross-functional teams (Byrd and Turner 2001a). In this way, a flexible IT infrastructure is a dual purpose i.e., operational as well as dynamic capability (Helfat and Winter 2011) that supports the operation of current IT applications, as well as enables reconfiguration of the IT infrastructure to meet changing needs.

Business flexibility is the dynamic managerial capability to precipitate intentional changes and adapt to environmental fluctuations (Adner and Helfat 2003). Business flexibility is conceptualized in terms of operational, structural, and strategic flexibility (Volberda 1996). Operational flexibility is the managerial capability to adapt to environmental fluctuations by changing factors of production and operational processes (Sambamurthy et al. 2003). Operations management variables are adapted through the outsourcing of non-core activities, managing the supply chain with a broader and varying number of suppliers, and by using temporary labor to adjust workforce size to shifts in demand (Volberda 1996). Structural flexibility refers to the managerial capability to adapt to environmental fluctuations by altering organizational structure and decision and communication processes (Huber and McDaniel 1986). This capability is realized through job enlargement, employment of multifunctional teams, and through decentralized, and flexible organizational structures (Teece 2007; Volberda 1996). Strategic flexibility is the managerial capability to adapt to environmental fluctuations by changing strategies and competitive actions (Nadkarni and Narayanan 2007). This type of flexibility is generated through rapid development of new products and markets, and by reformulating strategies for new opportunities (Volberda 1996).

A flexible IT infrastructure provides a digitized platform that enables firms to sense and respond to changes in the environment. Specifically, compatible and interconnected IT infrastructure enable firms to share information along the supply chain and facilitates real-time collaboration with supply chain partners that increases operational flexibility (Devaraj et al. 2007). For example, IT compatibility and connectivity enables firms to coordinate with suppliers on product design and production scheduling, and supports changes in product offerings produced in conjunction with suppliers (Wang and Wei 2007). Similarly, IT compatibility and IT connectivity enables managers to quickly search for and collaborate with new supply chain partners in response to new environmental opportunities (Gosain et al. 2005).

IT infrastructure flexibility also enables structural flexibility. IT compatibility, IT connectivity, and modularity enable managers’ to provide employees with real-time information. This enables managers’ to decentralize decision rights and empower employees to make timely and informed decision, increasing structural flexibility (Dean et al. 1992). Through IT compatibility and IT connectivity, IT infrastructure also facilitates cross-functional virtual teams that enable fast reconfiguration of organizational structures (Jarvenpaa and Leidner 1999; Majchrzak et al. 2000). For example, by linking managers and employees through compatible and connected IT infrastructure, a flexible infrastructure enables managers’ to dynamically form teams and take advantage of the diverse expertise distributed throughout the organization in a time, location, and rank independent manner (Dean et al. 1992).

The compatibility and connectivity of IT infrastructure can enable firms to capture and share real time information from the markets in which it is operating. Thus, managers with a flexible IT infrastructure can sense new opportunities and respond to competitive actions (e.g., the development of new products) by changing their current strategy, increasing firms’ strategic flexibility (Sambamurthy et al. 2003). Also, environmental scanning systems allow managers to identify gaps in its resource profile and help to identify acquisition targets. Similarly, a flexible IT infrastructure allows managers to analyze customer data and identify new products and new markets. Firms with flexible IT infrastructure can also develop new products and enter new markets faster. A flexible IT infrastructure enables firms to share data and process resources across business units through compatible, interconnected, and modular IT infrastructure. For example, a business unit may have valuable customer data or a unique customer
service process. A flexible IT infrastructure can enable the firm to share and leverage this customer base and/or customer service process across different business units to develop new products and/or enter new markets faster. Thus, IT infrastructure flexibility can enable managers to adapt to environmental fluctuations by facilitating changes at the operational, structural, and strategic levels. Therefore we hypothesize the following:

Hypothesis 1a (H1a): There is a positive relationship between IT infrastructure flexibility and business flexibility.

M&A activities refer to opportunities identified and pursued by a firm to reduce costs or achieve growth through M&A. Business flexibility may help firms to sense and seize M&A opportunities through operational, structural, and strategic flexibility (Nadkarni and Narayanan 2007). Operational flexibility may enable a firm to become aware of M&A opportunities in the course of the interaction with its customers and suppliers. A firm with experience managing a diverse supply chain may discover profitable opportunities to acquire one of its business partners. Similarly, firms with a decentralized and flexible organizational structure develop a creativity-based environment in which employees discern more M&A opportunities. For instance, firms that use cross-functional teams with diversity of ideas and expertise may discover more and better M&A opportunities than those with rigid organizational structures. In a similar way, decentralized firms where employees have more decision making authority and are more innovative may sense and pursue more and better M&A opportunities (Chandler et al. 2000). Finally, strategic flexibility may also lead to more M&A activities. Firms with strategic flexibility may recognize M&A opportunities before competitors (Nadkarni and Narayanan 2007). Strategic flexibility may also help firms to seize M&A opportunities through its ability to reformulate business strategies to take advantage of new opportunities. For example, a firm with high degree of experience entering and exiting markets will sense and seize M&A opportunities before its competitors. Therefore, we hypothesize that:

Hypothesis 1b (H1b): There is a positive relationship between business flexibility and M&A activities.

**IT Infrastructure Flexibility, Business Flexibility, and IT Integration Capability**

Organizational integration is the process of integrating some or all of the assets, structures, business processes, people, systems, and cultures of the acquirer and the target firm into an unified whole (Barki and Pinsonneault 2005). Organizational integration is the single most important factor in realizing synergy (Larson and Finkelstein 1999). Post-M&A IT integration capability (in short, IT integration capability) is the dynamic capability to reconfigure and integrate the IT and business resources of the acquirer and the target after an M&A. IT integration capability is conceptualized in terms of IT technical infrastructure integration, IT personnel integration, and IT and business processes integration. IT technical infrastructure integration is the firm’s capability to integrate the IT technical infrastructure (i.e., IT platform, databases, and IT applications) of the acquirer and the target after the M&A. IT personnel integration refers to the firm’s capability to integrate the IT personnel of the acquirer and the target after the M&A. The IT and business processes integration is the acquirer’s capability to integrate IT with the core business processes (e.g., customer service process) of the merged firm.

A flexible IT infrastructure is likely to lead to IT integration capability. The compatibility and connectivity of IT infrastructure enable IT technical infrastructure integration. The ability to share, communicate and be connected with any type of information across different IT components, inside or outside the firm, enable IT technical infrastructure integration. Similarly, compatibility and modularity of IT components enable firms to integrate the IT technical infrastructure and the IT and business processes of the merged firm. The compatibility and modularity of IT applications enable movement of data between applications, thus enabling the integration of the IT technical infrastructure (Chari and Seshadri 2004). IT compatibility and modularity also allow specific IT applications (i.e., digitized business processes) and components to be moved from one IT infrastructure (say of the target) to the IT infrastructure of the merged firm to lead to IT technical infrastructure and IT and business processes integration. Modularity also enables an acquirer to rapidly reconfigure IT applications and to adapt them to the needs of the merged firm, thus better integrating the IT technical infrastructure (Kumar 2004).

IT personnel skills flexibility enables IT technical infrastructure integration as the IT technical skills of IT personnel help the acquirer integrate IT platform, data, and applications of the merged firm (Byrd and Turner 2001a). Likewise, IT personnel skills flexibility leads to IT human infrastructure and IT and
business processes integration. The ability of IT personnel to understand the business problems of the merged firm and develop appropriate IT applications, and to work effectively in cross-functional teams with the IT and non-IT personnel from the target firm lead to IT human infrastructure and IT and business processes integration. IT personnel skills flexibility also enables the development new IT technical skills that are more compatible with the needs of the merged firm, enabling the integration of IT personnel (Saraf et al. 2007). The above discussion leads to the following hypothesis:

Hypothesis 2a (H2a): There is a positive relationship between IT infrastructure flexibility and IT integration capability.

Business flexibility is likely to increase a firm’s capability to integrate its IT and business resources after completing an M&A. M&A activities generate a number of changes. Thus, more flexible firms will be able to reconfigure the resource base of the acquirer and target firms faster than less flexible firms. For example, operational flexibility enables managers to reorganize their business processes. The managerial capability to move business processes from one business unit to another, the capability to change business partners, or the capability to move business processes from the IT infrastructure of the target to the IT infrastructure of the merged firm lead to the integration of IT technical infrastructure as well as the integration of IT and business processes.

The managerial capability to change organizational structure, allocation of decision rights and decision making processes is likely to lead to IT personnel integration (Stylianou et al. 1996). For example, a firm with an institutionalized use of multifunctional teams is more likely to include IT and business personnel in the M&A integration plans. Such use of cross-functional teams to align business planning with IT planning, M&A planning with IT planning, and M&A strategy with IT strategy, will lead to IT personnel integration and the integration of IT and business processes (Robbins and Stylianou 1999).

A firm with strategic flexibility is more likely to integrate IT and business processes after the M&A. The managerial capability to reformulate business strategies and reorganize IT and business processes to adapt to M&A opportunities will facilitate the integration of IT and business processes of the merged firm. Consequently, we hypothesize the following:

Hypothesis 2b (H2b): There is a positive relationship between business flexibility and IT integration capability.

**IT Integration Capability and Post-M&A Performance**

Post-M&A performance is defined as the financial and marketing performance of the acquiring firm after completing an M&A (Datta 1991). IT integration capability is likely to increase post-M&A performance through the generation of cost- and revenue-based synergies (Capron 1999). IT integration capability may increase post-M&A performance of the acquirer by consolidating the IT technical infrastructure and reducing the overall IT costs of the merged firm (Weber and Pliskin 1996). The integration of IT platform, IT applications, and databases - IT technical infrastructure integration - may reduce the overall IT costs through IT synergies (Capron and Pistre 2002). Similarly, the integration of IT applications, databases and business processes may create more value after M&A through the minimization of costs associated with failures, delays and disruptions in business operations (Tanriverdi and Uysal 2011).

IT integration capability can enable IT and business resources reconfiguration and allow acquirers to take advantage of opportunities that arise from M&A and increase post-M&A performance. Specifically, IT integration capability can enable a firm to redeploy business resources in new markets and realize economies of scope (Capron et al. 2001; Karim and Mitchell 2000). For example, an integrated IT technical infrastructure can enable the acquirer to enter new markets by marketing the products of the target firm to its own customer base. Similarly, the acquirer can coordinate its supplier base with the production capacity of the target firm to develop new products for its customer base. An integrated IT technical infrastructure and IT and business processes integration will also enable redeployment of process innovations. In this way, an integrated IT infrastructure can enable the acquirer to achieve revenue-based synergies from its business resources. The integration of IT technical infrastructure and IT and business processes may also generate revenue-based synergies by enhancing IT-based coordination mechanisms (Vielba and Vielba 2006). An acquirer that integrates its IT, supply chain, and customer service processes with those of the target will avoid failures and delays in operations such as ordering with
new suppliers or invoicing to new customers, which in turn will increase its post-M&A performance.

The integration of IT personnel may also lead to superior post-M&A performance. The integration of IT personnel of acquirer and target may generate cost- and revenue-based synergies by leveraging the talent and skills of IT personnel. Integration of IT personnel reduces tension, distrust, and career concerns of the target’s IT personnel, reducing integration costs (Larson and Finkelstein 1999). Similarly, after an M&A the acquirer may redeploy IT personnel from one business unit to another business unit where IT expertise is lower and increase its post-M&A performance. Therefore, we hypothesize that:

Hypothesis 3 (H3): There is a positive relationship between IT integration capability and post-M&A performance.

Research Methodology

Data and Sample

Since no public dataset offers all the information needed to answer our research questions, we conducted a survey in Spain (European Union). Using the Zephyr database produced by Bureau van Dijk, we developed a list of 1,164 public and private Spanish firms that had completed at least one M&A deal during 2004-2008.

The survey instrument was developed according to guidelines provided in prior research (Churchill 1979). We pre-tested the questionnaire with eleven practitioners (six business executives and five IT executives) and seven experts from academia. The survey had two components and we employed two key respondents per firm: (1) a business component to be completed by a business executive (e.g., Chief Executive Officer, General Manager, Director of Corporate Development); and (2) an IT component to be completed by an IT executive (e.g., Chief Information Officer, IT Manager, Chief Technology Officer) of the firm. The business component included the items related to business flexibility, post-M&A performance, and the control variables including pre-M&A relatedness, acquirer’s degree of diversification, and prior M&A experience. The IT component included the questions about IT infrastructure flexibility, IT integration capability, and the control variables including IT investment, and prior experience in IT integration.

The information about M&A activities, method of payment, and the number of acquirers’ and targets’ employees was obtained from the Zephyr database. Data on the acquirers’ cash availability was collected from the Amadeus and Sabi databases. The analysis also included a secondary measure of post-M&A performance from the Actualidad Económica database.

The survey was administered by a well-established Spanish market research consulting firm with expertise in this type of data collection. This firm collected the data by phone from April to September, 2009. To do so, the firm requested an appointment with each respondent, when the respondent answered the survey by phone. After two reminders to non-respondents, data were obtained from a total of 199 different firms, for an overall response rate of 17.096%. Data from 99 firms were eliminated because only one of the respondents, either the business or the IT executive, participated. Thus, the final valid number of respondent firms was 100. This provides an effective response rate of 8.6%, which is comparable to that of other studies with two key respondents per firm (e.g., Ray et al. 2004). This response rate can be considered as satisfactory, especially taking into account the challenge of accessing two top executives per firm. On average, responding firms had about 549 employees and fell into the following industries: banking and insurance (18%), food and beverage (14%), machinery manufacturing (10%), IT and telecommunications (9%), consulting services (7%), pharmaceutical, medical and biotechnology (7%), construction and estate agent services (5%), electronics (5%), and others (25%). Non-response bias was assessed by verifying that early and late respondents did not differ in their responses. We considered as early respondents those that responded to both parts of the questionnaire in the first six weeks. All possible t-test comparisons between the means of the two groups of respondents showed non-significant differences. Firms in the sample had completed, on average, 3.06 M&A in the period analyzed, with average value of each M&A being 50.872 million Euros.
**Measures**

To determine the measures to be used in the study, we conducted a comprehensive analysis of prior research and wherever possible used already validated scales. An essential aspect of measurement specification is understanding the nature of the relationships between constructs and measures (i.e., formative or reflective) and deciding between first- and second-order constructs (Hulland 1999; Jarvis et al. 2003), since these choices determine the suitable methods for subsequent evaluation of the measurement and structural models (Diamantopoulos and Winklhofer 2001; Gruber et al. 2010).

Formative constructs are characterized as follows: (1) the direction of causality is from indicators to constructs because the items are collectively defining the construct, so changes in indicators cause changes in the constructs; (2) the indicators need not be conceptually interchangeable since they need not have the same or similar content, and dropping an indicator may alter the conceptual domain of the construct; (3) it is not necessary for indicators to co-vary with each other. Reflective constructs hold the reverse characteristics. For example, the direction of causality is from constructs to indicators. In accordance with Petter et al. (2007), we establish our model as a type IV model; that is, all the constructs at first and second-order levels are conceptualized as formative. The appendix presents the survey items used to measure the first-order constructs employed in the study.

**Independent Variables**

**IT Infrastructure Flexibility**

Prior research (Byrd and Turner 2000; 2001b) suggests that IT compatibility, IT connectivity, modularity, and IT personnel skills flexibility are the key characteristics that a firm’s IT infrastructure should possess to be flexible. Consistent with this work, we operationalize IT infrastructure flexibility as a formative second-order construct determined by the dimensions of IT compatibility, IT connectivity, modularity, and flexibility of IT personnel skills. We measure these first-order constructs (i.e., IT compatibility, IT connectivity, modularity, and flexibility of IT personnel skills) using scales adapted from Duncan (1995) and Byrd and Turner (2000; 2001a; 2001b). Based on the decision criteria discussed above, we use a formative specification for these first-order constructs.

**Business Flexibility**

We conceptualize business flexibility as a formative second-order construct determined by operational, structural, and strategic flexibility. To measure these first-order constructs, we used three scales adapted from Volberda (1996) and Verdu-Jover et al. (2006). In accordance with the decision rules stated earlier, these first-order constructs were identified as being formative.

**IT Integration Capability**

Based on prior research (Giacomazzi et al. 1997; Robbins and Stylianou 1999; Stylianou et al. 1996; Weber and Pliskin 1996) and the suggestions of IT executives with experience in IT integration, we conceptualize IT integration capability as a higher-order construct determined by IT technical infrastructure integration, IT personnel integration, and IT and business processes integration capabilities. We thus conceptualize IT integration capability as a second-order formative construct determined by three first-order formative constructs: IT technical infrastructure, IT personnel, and IT and business processes integration capabilities.
Dependent Variables

M&A Activities

The number of M&A in the period 2004-2008 and the natural logarithm of average value of the M&A per firm were used as the two indicators of M&A activities. This construct was specified as formative because these indicators are not conceptually interchangeable and they need not co-vary.

Post-M&A Performance

Consistent with prior M&A literature (Hunt 1990), we measure acquirers’ post-M&A performance through the senior business executives’ subjective assessments. Based on the scales developed by Datta (1991), Capron (1999), and Schoenberg (2006) we asked each executive to assess how acquirer performance had evolved (1: Significant decline, 5: Significant increase) since the M&A, in terms of market share, sales, intrinsic profitability, profitability relative to industry average, earning per share, cash flow, tax efficiency, and overall performance. We identify post-M&A performance as a formative first-order construct, since the indicators refer to different characteristics of the post-M&A performance and because we did not expect most indicators to co-vary amongst themselves.

Several rationales support the use of perceptual post-M&A performance measure. First, prior research has shown that key respondents prefer perceptual performance measures because objective measures such as profits or costs are seen as confidential (Gruber et al. 2010). Further, a significant percentage of the firms in our sample are privately owned and were thus not obligated to reveal performance data. Second, post-M&A performance items were answered by top business executives, who are credited with high intellectual skills and a strong ability to recall events. Moreover, M&A are major organizational events and thus tend to be remembered more accurately and vividly (Huber and Power 1985). Considering that the executives responded in 2009 and provided information on M&A completed during the 2004-2008 period, we expect them to remember the post-M&A performance of their firms accurately.

Third, prior studies have shown that perceptual performance measures tend to correlate highly with objective metrics, which supports their validity (Dess and Robinson 1984). We assessed the validity of our subjective performance measure by triangulating the information provided by the respondents with secondary objective performance data available on a subset of firms in the sample. The rate of sectoral excellence (RSE) is an objective measure of firms’ sectoral positioning (Benitez-Amado and Walczuch 2012). The RSE can be estimated from secondary data contained in any known ranking of firms in the following way: RSE = 1 - (Ranking position of firm in the database analyzed / Total number of firms in the business sector in the database analyzed). The RSE will have a value between 0 and a value very close to 1 (termed the sector’s maximum value). The closer the RSE is to this maximum value for the sector, the better is the competitive position of the firm (Benitez-Amado and Walczuch 2012). Using objective information collected from the Actualidad Económica database, we estimated the RSE for the firms that made information available (ranging from 21 to 44 firms) for the years 2007, 2008, 2009, 2010, and 2011. We also calculated an average rate for the periods 2007-2011, 2008-2011, and 2009-2011. We correlated all of these measurements with the latent variable scores of post-M&A performance. We found high correlations (0.428**, 0.423**, 0.402*, 0.318*, 0.382*, 0.474*, 0.458*, and 0.436**; *p < 0.05, **p < 0.01) between the subjective post-M&A performance and the RSE for 2007, 2008, 2009, 2010, and 2011 and for the periods 2007-2011, 2008-2011, and 2009-2011, respectively. We also correlated the RSE values with post-M&A sales performance item and the results of the correlation analysis were similar. These results support the validity of our subjective measure (Gruber et al. 2010).

Cumulative abnormal returns (CARs) around M&A announcement dates reflect investors’ response to the announcement of an M&A (Schoenberg 2006). We have not used CARs to measure our dependent variable for the following reasons: (a) although CARs can provide an useful ex-ante measure of the investors’ expectations, they are less likely to be an accurate ex-post measure of firm performance (Haleblian et al. 2009); (b) due to the private nature of a significant percentage of firms in our sample, data on their share price were not publicly available, which precluded the estimation of their CARs.
Control Variables

Availability of cash was included as a control variable for M&A activities as a higher availability of cash may increase the propensity of managers to take strategic actions such as M&A (Haleblian et al. 2006). We measured availability of cash as the average liquidity ratio of the acquirer in the year before each M&A.

Pre-M&A relatedness, the acquirer’s degree of diversification, acquirer industry, acquirer size, method of payment, prior M&A experience, relative target size, IT investment, and prior experience in IT integration were included as control variables for post-M&A performance. First, we controlled for pre-M&A relatedness, since it is expected that firms translate its IT integration capability into business gains more easily in related than in non-related M&A (Stylianou et al. 1996). We measured pre-M&A relatedness using a five-item formative first-order construct adapted from the scale developed by Capron (1999). Second, we control for the acquirer’s degree of diversification as it is expected that acquirer’s diversification within the same business will correlate with post-M&A performance (Hunt 1990). We measure diversification with a three-point scale: 1: Conglomerate diversified into unrelated businesses, 2: Firm diversified into related businesses, and 3: Firm focused on one main business (Capron 1999). Third, we control for acquirer industry since the economic benefits obtained from M&A may depend on the acquirer’s industry (Hayward 2002). Fourth, acquirer size - measured as the natural logarithm of the total number of the acquiring firm’s employees - was included to control for economies of scale and scope effects. Fifth, we controlled for the method of payment since cash offers may reflect the synergy potential of a target and be associated with higher benefits from M&A. Method of payment was measured as the average method of payment by considering a value of 1 for all-cash offers and 0 otherwise (Tanriverdi and Uysal 2011). Sixth, prior M&A experience was also included as a control variable as it is expected that prior M&A experience is likely to positively influence the acquirer’s ability to increase its post-M&A performance (Hayward 2002). We measure prior M&A experience through the business executive’s assessment of the level of prior M&A experience. Seventh, since a bigger relative target size may generate a greater synergy exploitation for the acquirer (Capron 1999), we controlled for the relative target size, which was measured as the average ratio of the target’s number of employees to the acquirer’s number of employees (Haleblian et al. 2006).

Eighth, it is expected that firms with higher investment in IT resources will have more capabilities to integrate IT resources after an M&A, enabling easier development of IT integration capability and consequently higher post-M&A gains (Weber and Pliskin 1996). Therefore, we asked each senior IT executive about their annual IT investment as compared to the industry average. Finally, it is likely that acquiring firms with prior experience in IT integration will be able to translate these capabilities more easily into post-M&A performance than firms without this experience (Robbins and Stylianou 1999). We control for prior experience in IT integration by asking the senior IT executive about this experience.

Empirical Analysis

We employ partial least squares (PLS) SEM, and ordinary least squares estimation. We use the PLS software package SmartPLS 2.0.M3 to evaluate both the measurement and the structural models. We also perform two post-hoc mediation analyses to examine if business flexibility mediates between IT infrastructure flexibility and M&A activities, and whether business flexibility and IT integration capability mediate the impact of IT infrastructure flexibility on post-M&A performance. Mediation analyses combine the use of the above-mentioned PLS software package with SPSS 15.0 for Windows.

Several rationales support the use of the PLS SEM technique in this research. First, PLS is a variance-based SEM technique that has been used in prior research (Hulland 1999). Second, the use of PLS has been recommended when theoretical knowledge about a topic is scarce (Petter et al. 2007). Our study analyzes the impact of IT infrastructure flexibility, business flexibility and IT integration capability on M&A activities and acquirers’ post M&A performance. Insofar as it covers research questions that have not been examined in prior research, it reveals the degree to which prior theory is limited and PLS estimation is appropriate. Third, it is more appropriate to use PLS than covariance-based SEM techniques (e.g., LISREL) in complex theoretical structures such as those included in this study, as the likelihood of obtaining poor model fits increases with covariance-based models (Chin 2010). Fourth, PLS works better
with small data samples like those employed in this study compared with covariance-based SEM techniques (Hulland 1999). Despite its relatively small size, our sample exceeds the minimum sample size required to ensure an adequate level of accuracy and statistical power (Barclay et al. 1995). Finally, all of our constructs were identified as formative, and it is more appropriate to use PLS to estimate this type of model than it is to use covariance-based SEM techniques, since the use of the latter has been shown to lead to identification problems (Chin 1998). This flexibility-based advantage of PLS estimation is even more significant when estimating molar higher-order constructs, namely, second-order constructs whose epistemic relationships to their dimensions are also formative (Chin 2010), as in the proposed model.

Measurement Model Evaluation

Traditional assessments of validity and reliability do not apply well, since our measures are formative (Diamantopoulos and Winklhofer 2001). In accordance with prior literature on the assessment of formative constructs (Petter et al. 2007), we evaluate the content validity and perform a multicollinearity analysis for our constructs. First, we assess whether the indicators of first-order constructs and the dimensions of second-order constructs capture the full domain of the constructs. To do this, before the data collection, we ensured that the indicators and dimensions had content validity by starting from the theoretical foundations established in prior research and by pre-testing the questionnaire with 18 experts from practice and academia.

After the data collection, we examined the item and dimension weightings for the measures. The appearance of non-significant weights and the co-occurrence of positive and negative weights are statistically rational due to the high number of indicators we have employed in the constructs, and due to the different contribution of each measure to the construct (Cenfetelli and Bassellier 2009). We chose to keep non-significant and negative weights in order to preserve content validity (Chin 2010; Petter et al. 2007).

Second, we examine multicollinearity by calculating variance inflation factors (VIFs) at first- and second-order level and condition indices at the construct level (Diamantopoulos and Winklhofer 2001). We determine whether any of the indicators and dimensions had a VIF higher than 10 or a condition index higher than 30. Measures have multicollinearity problem if their VIFs are higher than 10, or their condition index is higher than 30 (Gruber et al. 2010). The VIF and condition indices values for all the indicators of first-order constructs and dimensions of second-order constructs were below the threshold criteria of 10 and 30 respectively, suggesting that there is no excessive multicollinearity in the data.

Structural Model Evaluation

Test of Hypotheses

We perform a bootstrap analysis with 500 subsamples to estimate the significance of the path coefficients (Chin 1998). Table 1 shows the results of the PLS estimation. We find support for all of the proposed hypotheses except for H2b. In particular, consistent with H1a and H1b, the empirical analysis suggests that IT infrastructure flexibility enables the development of business flexibility (0.001 level), and business flexibility enables firms to search and select M&A activities (0.01 level). Similarly, consistent with H2a, IT infrastructure flexibility enables the development of IT integration capability (0.001 level). However, business flexibility does not have a significant positive impact on IT integration capability (H2b), although the effect is in the hypothesized direction. Finally, per H3, IT integration capability enables firms to assimilate the M&A and helps to improve post-M&A performance.

As to the control variables, the empirical analysis suggests that acquirer size, prior M&A experience, and prior experience in IT integration positively influence post-M&A performance, although in a weak way. The analysis also seems to suggest that firms that focus on one main business reap fewer advantages from an M&A deal. The influences of availability of cash on M&A activities and of pre-M&A relatedness and IT investment on post-M&A performance are in the predicted direction although they are not significant.

In a PLS analysis, the values of the path coefficients, their level of significance, and the $R^2$ values are measures of how well a model is performing (Chin 2010; Hulland 1999). The path coefficients should be
around 0.20 and ideally be above 0.30 to be considered meaningful and economically significant (Chin 1998). The path coefficients to test the hypotheses range from 0.1 to 0.668 (from 0.257 to 0.668 if we only consider the path coefficients of the supported hypotheses), and all of them except one are significant at 0.05 level. The R² values for the four endogenous variables range from 0.096 to 0.539. Overall, the evaluation indicates satisfactory explanatory power for the structural model.

### Table 1. Results of the PLS Estimation

<table>
<thead>
<tr>
<th>Path</th>
<th>Path coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT infrastructure flexibility □ Business flexibility (H1a)</td>
<td>0.615***</td>
</tr>
<tr>
<td>Business flexibility □ M&amp;A activities (H1b)</td>
<td>0.257**</td>
</tr>
<tr>
<td>IT infrastructure flexibility □ IT integration capability (H2a)</td>
<td>0.668***</td>
</tr>
<tr>
<td>Business flexibility □ IT integration capability (H2b)</td>
<td>0.1</td>
</tr>
<tr>
<td>IT integration capability □ Post-M&amp;A performance (H3)</td>
<td>0.276'</td>
</tr>
<tr>
<td>Availability of cash □ M&amp;A activities (control variable)</td>
<td>0.166</td>
</tr>
<tr>
<td>Pre-M&amp;A relatedness □ Post-M&amp;A performance (control variable)</td>
<td>0.128</td>
</tr>
<tr>
<td>Acquirer’s degree of diversification □ Post-M&amp;A performance (control variable)</td>
<td>-0.348**</td>
</tr>
<tr>
<td>Acquirer industry □ Post-M&amp;A performance (control variable)</td>
<td>-0.001</td>
</tr>
<tr>
<td>Acquirer size □ Post-M&amp;A performance (control variable)</td>
<td>0.158'</td>
</tr>
<tr>
<td>Method of payment □ Post-M&amp;A performance (control variable)</td>
<td>-0.034</td>
</tr>
<tr>
<td>Prior M&amp;A experience □ Post-M&amp;A performance (control variable)</td>
<td>0.19'</td>
</tr>
<tr>
<td>Relative target size □ Post-M&amp;A performance (control variable)</td>
<td>-0.065</td>
</tr>
<tr>
<td>IT investment □ Post-M&amp;A performance (control variable)</td>
<td>0.069</td>
</tr>
<tr>
<td>Prior experience in IT integration → Post-M&amp;A performance (control variable)</td>
<td>0.189'</td>
</tr>
<tr>
<td>Construct</td>
<td>R²</td>
</tr>
<tr>
<td>Business flexibility (H1a)</td>
<td>0.378</td>
</tr>
<tr>
<td>M&amp;A activities (H1b)</td>
<td>0.096</td>
</tr>
<tr>
<td>IT integration capability (H2a and H2b)</td>
<td>0.539</td>
</tr>
<tr>
<td>Post-M&amp;A performance (H3)</td>
<td>0.428</td>
</tr>
</tbody>
</table>

*p < 0.10, **p < 0.05, ***p < 0.01, ****p < 0.001

We check the robustness of the proposed model by estimating three alternative models. The first model assumes that business flexibility influences IT infrastructure flexibility (i.e., business flexibility → IT infrastructure flexibility, and IT infrastructure flexibility → M&A activities, but every other relationship in the base model remains the same). The second model assumes that IT integration capability influences business flexibility (and everything else in the base model remains the same). Finally, the third model assumes that M&A activities directly influence IT integration capability and post-M&A performance (and everything else in the base model remains the same). Overall, none of the three alternative models significantly improves upon the explanatory power of the proposed model, indicating that the proposed model provides a very plausible explanation of the data.

### Post-hoc Mediation Analyses

We perform two post-hoc mediation analyses to examine if business flexibility mediates between IT
infrastructure flexibility and M&A activities (i.e., mediation analysis 1), and to examine whether business flexibility and IT integration capability mediate the impact of IT infrastructure flexibility on post-M&A performance (i.e., mediation analysis 2). First, we perform the causal steps procedure for mediation analysis proposed by Baron and Kenny (1986). The two PLS analyses and the estimation results suggest that all steps are met in both the mediation analyses.

In the first mediation analysis, the first step - in which a path between IT infrastructure flexibility and M&A activities is tested - fulfills the condition (beta = 0.511***). The second and third steps also meet the conditions. Specifically, the path coefficients between IT infrastructure flexibility and business flexibility, and between business flexibility and M&A activities are 0.702*** and 0.253*** respectively. Finally, when we incorporate a direct link between IT infrastructure flexibility and M&A activities into the third step, this path is non-significant (beta = 0.004), while the remaining paths continue to be significant, thus satisfying the fourth step as well. Thus the data suggest that business flexibility fully mediates the relationship between IT infrastructure flexibility and M&A activities.

Regarding the second mediation analysis, the path coefficient between IT infrastructure flexibility and business flexibility is 0.543*** which fulfills the first step. The second and third steps are also met as the path coefficients between IT infrastructure flexibility and business flexibility (0.694***), between business flexibility and IT integration capability (0.538***), and between IT integration capability and post-M&A performance (0.542***)) are significant. Finally, per the fourth step, the path between IT infrastructure flexibility and post-M&A performance is non-significant (0.115), while the remaining paths continue being significant, suggesting that business flexibility and IT integration capability fully mediate the relationship between IT infrastructure flexibility and post-M&A performance.

However, the procedure proposed by Baron and Kenny (1986) does not allow to us to assess the total and specific indirect effects of the mediator variable(s). Consequently we develop a complementary mediation analysis by performing a bootstrap confidence intervals test which enables us to measure the total and specific indirect effects of the intermediate variables included in the model (Preacher and Hayes 2004). This approach addresses the weaknesses associated with the Sobel test (Preacher and Hayes 2008).

In the first mediation analysis we examine the direct and the specific indirect (i.e., through business flexibility) effect of IT infrastructure flexibility on M&A activities. This procedure uses the INDIRECT script for SPSS described in Preacher and Hayes (2008), with 5000 bootstrap samples. Table 2A presents this analysis. The coefficients in columns 2 and 3 provide evidence consistent with H1a and H1b respectively. Column 4 provides the estimates of the indirect effects and column 5 provides the 95% bootstrapped confidence intervals for the estimates of the indirect effects. If zero is not in the confidence interval, one can claim that there is evidence of an indirect effect linking the independent (i.e., IT infrastructure flexibility) and dependent variable (i.e., M&A activities) through the intermediate variable (i.e., business flexibility) with 95% confidence (Preacher and Hayes 2008). The total indirect effect of IT infrastructure flexibility on M&A activities is 0.175, which is significant at a level of 95%. This suggests that the impact of IT infrastructure flexibility on M&A activities is fully mediated by business flexibility. This finding is consistent with the results obtained from the Baron and Kenny (1986) procedure that IT-enabled business flexibility helps firms to sense and seize M&A opportunities. The total effect of IT infrastructure flexibility on M&A activities is equal to the sum of the direct effect and the total indirect effect: 0.179 = 0.004 + 0.175.

Regarding the second mediation analysis, we also use the MEDTHREE macro for SPSS described in Hayes et al. (2011), with 5000 bootstrap samples. This mediation analysis examines the direct and the specific indirect (i.e., through business flexibility and IT integration capability) effects of IT infrastructure flexibility on post M&A performance. Table 2B presents this analysis. The path coefficients in columns 2, 3, and 4 provide evidence consistent with H1a, H2a, and H3 that IT infrastructure flexibility enables the development of business flexibility and IT integration capability, and IT integration capability helps acquirer to assimilate M&A and increase post-M&A performance. Column 5 provides estimates of the indirect effects, and column 6 presents the 95% bootstrap confidence intervals for the estimates of indirect effects. The total indirect effect of IT infrastructure flexibility on post-M&A performance is 0.399, which is significant at a level of 95%. This implies that business flexibility and IT integration capability fully mediate the impact of IT infrastructure flexibility on post-M&A performance. This result is also consistent with those obtained by performing the Baron and Kenny (1986) procedure. The indirect effect is mainly determined by the specific indirect effect through IT integration capability (0.291, significant).
The remaining indirect effect is through business flexibility (0.078, not significant), and through both business flexibility and IT integration capability (0.03, not significant). The total indirect effect of IT infrastructure flexibility on post-M&A performance is equal to the sum of the above-mentioned specific indirect effects: 0.399 = 0.291 + 0.078 + 0.03. The total effect of IT infrastructure flexibility on post-M&A performance is equal to the sum of the direct effect plus the total indirect effect: 0.446 = 0.047 + 0.399.

<table>
<thead>
<tr>
<th>Path coefficients and Indirect Effects for the Mediation Analysis 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path coefficients to:</td>
</tr>
<tr>
<td>Column 2</td>
</tr>
<tr>
<td>Business flexibility</td>
</tr>
<tr>
<td>IT infrastructure flexibility</td>
</tr>
<tr>
<td>Business flexibility</td>
</tr>
<tr>
<td>Total indirect effect</td>
</tr>
<tr>
<td>IT infrastructure flexibility □ Business flexibility □ M&amp;A activities</td>
</tr>
<tr>
<td>Total effect (IT infrastructure flexibility → M&amp;A activities) = 0.179† (0.099). Standard error in parentheses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Path coefficients and Indirect Effects for the Mediation Analysis 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path coefficients to:</td>
</tr>
<tr>
<td>Column 2</td>
</tr>
<tr>
<td>Business flexibility</td>
</tr>
<tr>
<td>IT infrastructure flexibility</td>
</tr>
<tr>
<td>Business flexibility</td>
</tr>
<tr>
<td>IT integration capability</td>
</tr>
<tr>
<td>Total indirect effect</td>
</tr>
<tr>
<td>IT infrastructure flexibility □ Business flexibility □ Post-M&amp;A performance</td>
</tr>
<tr>
<td>IT infrastructure flexibility □ IT integration capability □ Post-M&amp;A performance</td>
</tr>
<tr>
<td>IT infrastructure flexibility □ Business flexibility □ IT integration capability □ Post-M&amp;A performance</td>
</tr>
<tr>
<td>Total effect (IT infrastructure flexibility → Post-M&amp;A performance) = 0.446*** (0.09). Standard error in parentheses</td>
</tr>
</tbody>
</table>
Overall, the post-hoc mediation analyses support the findings obtained in the test of the hypotheses. IT infrastructure flexibility enables the business flexibility to discover and select M&A opportunities; and that IT infrastructure flexibility also facilitates IT integration capability, which in turn help acquirers to assimilate M&A and realize the economic benefits of M&A.

**Discussion and Conclusion**

M&A are perceived by top executives as an attractive way to grow. However, the failure rate of M&A is around 50% (Schoenberg 2006). The objective of this research is to understand the impact of IT on acquirers’ ability to sense and seize M&A opportunities and to realize the economic benefits from M&A. In particular, we are interested in examining if IT can facilitate the identification, selection, and assimilation of M&A opportunities. A distinctive feature of this study is that the extant empirical research in M&A primarily studies large, public, and North American or British M&A (Cartwright and Schoenberg 2006). In contrast, the context of this study is mid-size firms in Spain, a market with significant M&A activity that, however, has been explored in prior research on M&A in a very limited way.

The analysis indicates that IT infrastructure flexibility has a positive relationship with business flexibility, and business flexibility enables firms to sense and seize M&A opportunities. This finding suggests that a flexible IT infrastructure enables managers’ to coordinate with different business partners, change business processes, adjust organizational structure and decision-making processes, and adapt business strategies. Such business flexibility, in turn, helps managers’ to identify and select M&A opportunities.

This research introduces the construct of IT integration capability. The empirical analysis indicates that IT infrastructure flexibility has a positive relationship with IT integration capability. As M&A imply a large number of changes, firms with flexible IT infrastructure have the capability to integrate their IT technical and IT human resource infrastructures and the IT and business processes of the merged firm. The empirical analysis also suggests that IT integration capability leads to improved post-M&A performance. This suggests that the capability to integrate IT technical and IT human resource infrastructures and integrate IT and business processes, will enable firms to realize the economic benefits from their M&A activities.

The post-hoc mediation analysis suggests that business flexibility fully mediates the impact of IT infrastructure flexibility on M&A activities. In other words, IT infrastructure flexibility facilitates the pursuit of M&A opportunities by enabling managers to partner with different customers and suppliers, adapt decision making structure and processes, and the ability to change strategies to take advantage of new opportunities. The post-hoc mediation analysis also suggests that business flexibility and IT integration capability fully mediate the impact of IT infrastructure flexibility on post-M&A performance. In particular, the main indirect effect is provided by IT integration capability, followed by the indirect effect of business flexibility. This finding reinforces the idea that IT infrastructure flexibility enhances post-M&A performance through the capability to integrate the IT and business processes of the merged firm. The results of the post-hoc analysis are consistent with the emerging perspective on IT-enabled organizational capabilities, which suggests that value from IT is achieved indirectly through higher-order capabilities such as knowledge management (Tanriverdi 2005).

The key contribution of this study is to illustrate how IT affects performance from M&A. To the best of our knowledge this is the first study to add IT-enabled business flexibility and IT integration capability as variables in the equation for M&A success. In this regard, this research presents IT-enabled business flexibility and IT integration capability as the dynamic capabilities through which IT creates value for acquirers. IT infrastructure flexibility improves post-M&A performance indirectly through the business flexibility to sense and seize M&A opportunities, and through the IT integration capability to assimilate M&A.

Dynamic capabilities provide value by search, selection, and reconfiguration of firms’ capabilities (Helfat et al. 2007). In this regard, this research illustrates how a dual purpose capability (i.e., flexible IT infrastructure) facilitates the development of a dynamic managerial capability (i.e., business flexibility) that enables search and selection of M&A opportunities. Similarly, this research illustrates how a dual purpose capability (i.e., flexible IT infrastructure) facilitates the development of a dynamic capability (i.e., IT integration capability) that enables reconfiguration of the resources of the target and the acquirer to
provide value in the form of post M&A performance.

The results of this study have important implications for managers. First, the study provides managers with insights about how to develop a flexible IT infrastructure. A firm’s IT infrastructure will be flexible if IT components follow standards for compatibility and connectivity and are modular. A firm’s IT infrastructure will also be flexible if IT personnel can learn and develop IT applications using different information technologies. A firm with flexible IT infrastructure will develop the business flexibility to be able to take advantage of new opportunities, such as the opportunities from M&A.

Second, the research analyzes IT integration capability, a firm’s capability to integrate IT technical and IT human resource infrastructure and integrate the IT and business processes of the acquirer and the target, after the M&A, and the enabling role of IT infrastructure and business flexibility in the generation of the former. The results suggest that IT integration capability seems to be easier to generate in firms with flexible IT infrastructure. The failure rate associated with M&A is around 50% (Schoenberg 2006). Similarly, firms spend millions of Euros on IT but the business value of these investments has not been very clear (Benitez-Amado and Walczuch 2012). In this regard the finding that IT integration capability can increase acquirers’ post-M&A performance is important for managers seeking to create value from M&A. Likewise, the finding that IT infrastructure flexibility will increase post-M&A performance indirectly through business flexibility and IT integration capability, is an important finding for managers seeking to generate greater returns from their IT investments.

This research has some limitations that suggest directions for future work. First, the study is cross-sectional which precludes examination of causal relationships. However, this is a common limitation in organizational research due to the difficulty in obtaining panel data from top executives. Second, the empirical analysis suggests that IT infrastructure flexibility, business flexibility, and IT integration capability are associated with M&A activities and post-M&A performance. Though we control for IT investment to account for the cost of developing a flexible IT infrastructure and IT integration capability, business flexibility is not costless. It is important to understand how business flexibility is developed and if it’s value in terms of post-M&A performance benefits are commensurate with its cost. Third, the theoretical development in this study is at the second-order level (e.g., IT infrastructure flexibility, business flexibility, IT integration capability). Future research can pursue more refined i.e., dimension level theoretical development. For example, it will be valuable to explore the impact of modularity of IT infrastructure on structural flexibility and IT technical infrastructure integration.

Appendix: Information on Survey Items

Except where otherwise indicated in the table below, the possible range for measures was from 1 to 5 (1: Strongly disagree, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Strongly agree).

<table>
<thead>
<tr>
<th>IT compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote, branch, and mobile offices do not have to perform any additional steps or procedures to access data from home or central office</td>
</tr>
<tr>
<td>Software applications can be easily transported and used across multiple platforms</td>
</tr>
<tr>
<td>Our firm provides multiple interfaces or entry points (e.g., web access) for external end users</td>
</tr>
<tr>
<td>IT department provides access to a large variety of data types, including text, voice, and graphics</td>
</tr>
<tr>
<td>Our firm has established corporate rules and standards for hardware and operating systems to ensure platform compatibility</td>
</tr>
<tr>
<td>Data captured in one part of our organization are immediately available to everyone in the firm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IT connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our organization has electronic links and connections throughout the entire firm</td>
</tr>
<tr>
<td>Our firm is linked to customers through electronic channels (e.g., websites, email, wireless devices, electronic data interchange)</td>
</tr>
<tr>
<td>Our firm is linked to business partners through electronic channels (e.g., websites, email, wireless devices, electronic data interchange)</td>
</tr>
</tbody>
</table>
All remote, branch, and mobile offices are connected to the central office
Our firm utilizes open systems network mechanisms to boost connectivity
There are very few identifiable communications bottlenecks within our firm
In our firm end users are electronically linked with others end users

**Modularity**
Our firm possesses a great speed in developing new business applications or modifying existing applications
Our corporate database is able to communicate in several different protocols
Reusable software modules are widely used in new systems development
IT personnel utilize object-oriented technologies to minimize the development time for new applications
Our firm easily adapts to various vendors’ database management systems protocols and standards
Mobile users have ready access to the same data used at desktops
IT personnel use object-oriented and prepackaged modular tools to create software applications

**IT personnel skills flexibility**
Our IT personnel have the ability to work effectively in cross-functional teams
Our IT personnel are able to interpret business problems and develop appropriate technical solutions
Our IT personnel are knowledgeable about business functions
Our IT personnel are encouraged to learn about business functions
Our IT personnel are encouraged to learn new technologies
Our IT personnel are self-directed and proactive
Our IT personnel are knowledgeable about the key success factors in our firm
Our IT personnel have the ability to work cooperatively in a project team environment

**Operational flexibility**
Our firm outsources non-core activities
Our firm obtains resources from more than one supplier
Our organization uses temporary personnel to develop firm activities
Our firm uses its quick-response routines to reduce uncertainty
Our firm has an extensive operational repertoire
Our firm uses crash teams (teams that are developed quickly to solve an unexpected problem)

**Structural flexibility**
Our firm develops an empowerment (more decision making authority for employees) culture
Our firm is able to change its control systems
Our firm facilitates the development of self-managed teams
Our firm is able to change managerial roles
In our firm we apply horizontal extension of responsibilities (job enlargement), that is, the ability to perform a broader repertoire of activities
Our organization implements training and learning practices to stimulate flexible attitudes among the firm’s members
In our firm we create multifunctional teams

**Strategic flexibility**
Our firm has the ability to change its business strategy
Our firm is able to change its IT strategy
Our firm can increase with ease the variety of products (good and/or services) delivery
Our firm can increase with ease the variety of markets embraced
Our firm dismantles current strategies quickly with low costs
Our firm creates new product market combinations
Our firm apply periodically new technologies
Our firm influences consumers through advertising and promotions

<table>
<thead>
<tr>
<th>IT technical infrastructure integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our firm was able to integrate related technologies across organizational units after the M&amp;A</td>
</tr>
<tr>
<td>Our organization was able to integrate databases of both firms (acquirer and target) after the M&amp;A</td>
</tr>
<tr>
<td>Our organization was able to integrate business applications of both firms after the M&amp;A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IT personnel integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT personnel participated in the M&amp;A planning process</td>
</tr>
<tr>
<td>IT personnel had prior post-M&amp;A IT integration experience</td>
</tr>
<tr>
<td>IT personnel participated in the IT integration decision making process</td>
</tr>
<tr>
<td>IT personnel participated in the post-M&amp;A integration process</td>
</tr>
<tr>
<td>Our organization retained the IT and business talents of both firms that were at the core of the M&amp;A</td>
</tr>
<tr>
<td>Our organization was able to integrate IT personnel skills of both firms after the M&amp;A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IT and business processes integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our organization was able to integrate IT and M&amp;A management’s experience of both firms</td>
</tr>
<tr>
<td>Our organization was able to integrate IT planning with organizational planning of both firms</td>
</tr>
<tr>
<td>Our firm provided corporate-wide information accessibility to all people during and/or after the M&amp;A process</td>
</tr>
<tr>
<td>Our organization was able to integrate IT strategy of both firms with M&amp;A strategy</td>
</tr>
<tr>
<td>Our organization was able to integrate IT with higher-order organizational capabilities of both firms after the M&amp;A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-M&amp;A performance: Since the acquisition, how the following issues changed? (1: Significant decline, 5: Significant increase)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market share</td>
</tr>
<tr>
<td>Sales</td>
</tr>
<tr>
<td>Intrinsic profitability (profit/capital employed)</td>
</tr>
<tr>
<td>Return of investment relative to industry average</td>
</tr>
<tr>
<td>Earnings per share</td>
</tr>
<tr>
<td>Cash flow</td>
</tr>
<tr>
<td>Tax efficiency</td>
</tr>
<tr>
<td>Overall performance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-M&amp;A relatedness (control variable): How comparable was your organization’s business to that of the acquired firm just before the M&amp;A process? (1: Not at all, 5: Absolutely)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The products (goods and/or services) were similar</td>
</tr>
<tr>
<td>The technology was similar</td>
</tr>
<tr>
<td>Geographical markets were similar</td>
</tr>
<tr>
<td>The types of customers were similar</td>
</tr>
<tr>
<td>We were direct competitors</td>
</tr>
</tbody>
</table>
References


