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## Impacts of IT Resources on Business Performance Within the Context of Mergers and Acquisitions

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### Cover Page Footnote

While IT has been found to have significant impacts on firm performance, recent research has suggested that such business impacts of IT need to be examined within the business context in which IT is used. As firms engage in mergers and acquisitions to grow, IT has been recognized as one of the critical factors that influence merger success. However, little research has examined the business performance impacts of IT in enabling firms to exploit synergies from their mergers. This research provides theoretical insight which aims at answering the research question "How do different types of IT resources influence firm performance in the context of mergers and acquisitions?" Implications for future research and management practices are also discussed.

# **Impacts of IT Resources on Business Performance Within the Context of Mergers and Acquisitions**

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## **ABSTRACT**

*While IT has been found to have significant impacts on firm performance, recent research has suggested that such business impacts of IT need to be examined within the business context in which IT is used. As firms engage in mergers and acquisitions to grow, IT has been recognized as one of the critical factors that influence merger success. However, little research has examined the business performance impacts of IT in enabling firms to exploit synergies from their mergers. This research provides theoretical insight which aims at answering the research question “How do different types of IT resources influence firm performance in the context of mergers and acquisitions?” Implications for future research and management practices are also discussed.*

## **INTRODUCTION**

In growing their business, firms engage in different strategies. While some firms engage in internal growth, others engage in series of mergers and acquisitions (M&A) in order to expand their business. Over the last few decades, firms have increasingly been spending tremendous amounts of money on M&A. On a global scale, total value of announced mergers and takeovers in 2006 passed the record year 2000's \$3.3 trillion (The Economist, Nov 23<sup>rd</sup>, 2006). While the number of M&A reduced in 2008 due to the economic recession, the number of M&A in the first six months of 2010 has increased compared to the same period in 2009, coupled with the recovery of the global economy (The Economist, July 1<sup>st</sup>, 2010). However, there is considerable evidence from business practice and research that between 60 to 80 percent of M&A cases end up in failure (Homburg & Bucerius, 2006; Gillis & Combs, 2009).

Information Technology (IT) has been recognized as one of the critical factors that influence mergers success. IT and IT-dependent synergies account for about 40 percents of value created by mergers (Chabrow, 2006). In another estimate by Forrester consulting, IT potentially contributes to 10% of operating profit by delivering common processes and systems after mergers (Wailgum, 2010). Not only does IT significantly influence post-merger organizational success, different types of IT investments induce distinct performance effects through their differential impacts on firms' structures, processes, capabilities and product-markets (Weill, 1992; Barua, Kriebel, & Mukhopadhyay, 1995; Aral & Weill, 2007). Despite the recognized importance of IT in enabling firms to maximize benefits gained from their acquisitions, my literature review found little research examining the impacts of different types of IT resources on post-merger firm performance.

To address such knowledge gap, I develop a theoretical framework to examine the impacts of different types of IT resources on post mergers firm performance for firms adopting growth

strategy via M&A. In summary, my research aims at providing insight to answer the research question: How do different types of IT resources influence firm performance in the context of M&A? More specifically, I develop a theoretical model and suggest propositions regarding the differential impacts of different types of IT resources (automate, informate, transform) on post-merger firm performance in the context of different types of mergers (vertical, related horizontal, unrelated horizontal).

In doing so, the research contributes to the strategic IT management and business value of IT literature in several ways. First, by placing IT within the context of firms' growth strategy via M&A, my research provides further understanding on firm performance impacts of IT within business context, an issue that recent research has called for (Aral & Weill, 2007; Bharadwaj et al., 2007; Kohli & Grover, 2009). Secondly, my insight provides a theoretical framework that help guide future research and management practices in aligning IT strategy and M&A strategy to help firms maximize potential synergies from their mergers and improve firm performance.

The following section will describe different types of M&A that firms engage in as well as different types of IT resources that are related to firms' IT strategy. Afterwards, the research model and propositions regarding the performance impacts of different types of IT resources within the context of different merger types will be proposed. I finish with discussions on my research's contributions and the implications of my ideas for future research and management practice regarding the role and performance impacts of IT within mergers and acquisition context.

## **MERGERS AND ACQUISITIONS AND IT RESOURCES**

It is widely agreed that the "success" of a merger or acquisition may be defined as the creation of synergy: the value of the combined firm is greater than that of the two firms operating separately. In this section, I discuss the different types of mergers that firms engage in and how business values are expected to be created from such mergers.

### ***Mergers and Acquisitions Types***

Firms choosing to follow external growth strategy can engage in series of M&As. Previous research has categorized mergers as vertical mergers, related horizontal mergers, and unrelated horizontal mergers (Clemons & Row, 1991; Capron, 1999; King, Dalton, Daily, & Covin, 2003). Firms can engage in vertical mergers whereby the target and the bidding firms provide goods and services at different stages of a single value chain. The interaction among the firms involves the flow of goods, services, and information along a single value chain with the output of one becoming the input of the other (Clemons & Row, 1991; Ray, Wu, & Konana, 2009) (e.g. manufacturers & retailers). As the results of a vertical merger, successive activities in a value chain which has been conducted by different firms are brought in-house in a single firm.

Firms can also engage in horizontal mergers in which the target and bidding firms can provide similar or complementary goods and services at the same stage of a value chain, in the same or different markets. The two firms can employ similar or complementary strategic resources, or have common fixed factors of production (Clemons & Row, 1991; Capron, 1999; Hill &

Hoskisson, 1987; Ravichandran, Liu, Han, & Hasan, 2009). For example, when two commercial banks engage in a merger, the acquiring bank can benefit from having a larger branch and automated teller machine (ATM) system.

Among horizontal mergers, the level of similarity between the bidding firm's and the target firm's resources and product-market can be used to gauge the level of relatedness between the two firms (King et al., 2004; Chari, Devaraj, & David, 2008). The more similar the two firms' resources, product markets and activities, the more related they are. Less related firms are categorized as having complementary, rather than similar, resources and product markets. For example, the mergers of two retail banks would be considered related as they offer the same services, but might be in different markets. Meanwhile, when an airline company acquires a hotel chain, this could be considered unrelated as the two firms do not offer similar services and their resources are not similar. However, the two companies' resources and services are complementary as both companies offer services to travelers. While greater relatedness of horizontally merging firms allow them to exploit cost savings through sharing fixed costs and similar resources across business lines, less related firms have more potential to gain benefits from combining complementary resources and products to increase product value or create new product classes, helping firms to move to new product markets. Here, I define related-horizontal mergers are mergers among firms that have similar resources and product markets, while unrelated-horizontal mergers are mergers among firms that have complementary resources and product markets.

### ***IT Resources***

In developing an appropriate IT strategy that enable firms to gain value from their mergers, companies need to invest in and develop appropriate IT resources and their complementary human and management resources (e.g. Rai, Patnayakuni, & Seth, 2006; Bharadwaj, Bharadwaj, & Bendoly, 2007; Klein, Rai, & Straub, 2007). IT resources have been defined as comprising of (1) tangible technical components, (2) human technical and managerial IT skills, and (3) intangible IT-enabled resources such as knowledge, customer orientation, etc. (Bharadwaj, 2000). Utilizing the resource-based view of the firm, different studies have shown that the combination of IT technical resources (e.g. infrastructure, business applications) and human resources (e.g. technical and managerial skills) confers firms with unique capabilities that help them increase efficiency, profitability, innovation, and gain sustained competitive advantage (e.g. Melville, Kraemer, & Gurbaxani, 2004; Aral & Weill, 2007; Maiga & Jacobs, 2009).

While IT resources have been found to have significant impacts on organizational changes, it has become well understood that such resources are not interchangeable. Different types of IT investments induce distinctive performance effects through their differential impacts on organizational capabilities, structures, processes and product-markets (Weill 1992; Dehning, Richardson, & Zmud, 2003; Pavlou & El Sawy, 2006; Aral & Weill, 2007). Thus, I specifically examine the role of different types of IT resources in enabling firms to gain benefits from their mergers. While different categorization frameworks of IT resources exist, I adopt a framework that was developed by Zuboff (1988) and Schein (1992) and has been widely applied by recent research to examine topics such as IT signaling (Zmud, Shaft, Zheng, & Croes, 2010) and the impacts of IT on business performance (e.g. Weill, 1992; Dehning et al., 2003; Aral & Weill,

2007). In this categorization framework, IT resources (both technical & human) are categorized into:

*Automate:* Resources that help firms automate business processes, reducing or eliminating the hands-on role served by human assets in order to carry out work processes and work tasks faster, more efficiently and/or more accurately.

*Informate:* Resources that help firms make available timely and relevant data to managers, employees and external entities (e.g., customers & suppliers) such that these individuals better understand the work situations being faced in order to carry out work processes and work tasks more effectively and/or more efficiently.

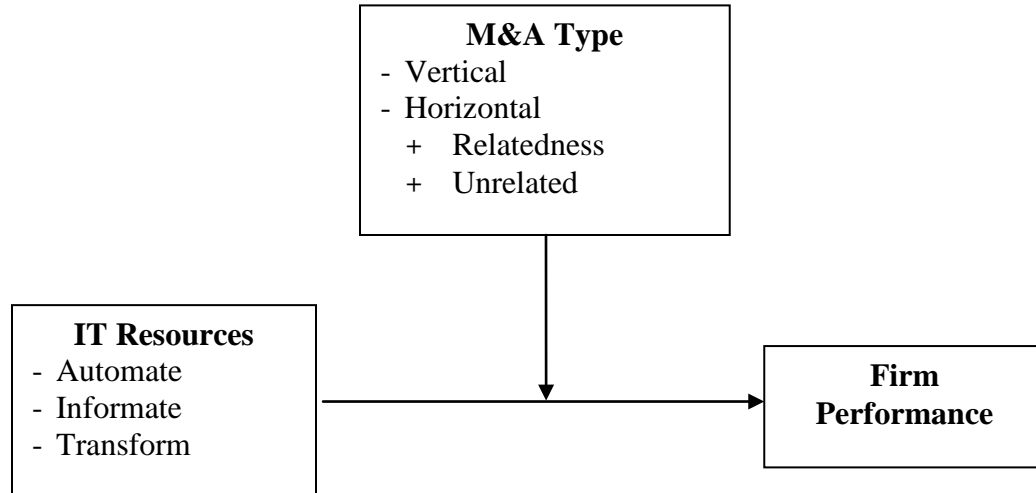
*Transform:* Resources that help firms restructure or reconstitute business/industry assets, capabilities, practices, processes and/or relationships in order to help firms develop new products, services, or business processes, reposition in the market place, or break into new market.

The following sections will examine the impacts of different types of IT resources on firm performance for firms adopting growth strategy via engaging in different types of M&As.

### **IMPACTS OF IT RESOURCES ON FIRM PERFORMANCE IN M&A**

While IT has been found to have significant impacts on firm performance, recent research has shown that it is critical to examine the business performance impacts of IT within the business context that IT is adopted and employed (Lai et al., 2008; Louis et al., 2008; Kohli & Grover, 2009; Zacharia et al., 2009). While limited research has examined IT strategy and IT performance impacts within the context of M&A, recent research has examined the performance impacts of IT investments within the context of firms' vertical integration and diversification strategy. For example, research has found a relationship between the level of integration and diversification and firms' IT spending (Dewan, Michael, & Min, 1998; Ray et al., 2009). Furthermore, IT spending's performance impacts have been found to vary depending on the level of firms' diversification (Chari et al., 2008; Ravichandran et al., 2009). However, the differential performance impacts of different types of IT resources within different context of mergers have not been examined. Figure 1 illustrates the research model. The appropriate interaction of IT strategy in developing different types of IT resources with merger type would result in improved post-merger firm performance. Firm performance in business value of IT research has been measured as success of business activities such as market growth (share gain, sales growth) or financial performance (return on sales, profitability) (e.g. Aral & Weill, 2007; Ravichandran et al., 2009). In the following sections, I develop arguments to support propositions regarding the performance impacts of different types of IT resources within the context of different merger types.

**Figure 1: Research Model.**



### ***M&As and IT Resources***

Transaction cost economics provides a theoretical base for previous research on the relationship between IT investments and the structures and processes linking different business activities (Hitt, 1999). Transaction cost economics posits that the organization of economic activities is strongly influenced by the costs of coordinating and managing interactions between economic activities. Two types of coordination costs exist: internal and external (e.g. Gurbaxani & Whang, 1991; Dewan et al., 1998; Hitt, 1999). Internal coordination costs represent costs associated with the processing, sharing and communicating decision information within and across levels of management hierarchy, as well as costs associated with the monitoring and performance evaluation required to deal with the agency problems arising from incentive conflicts in delegated decision settings. External coordination costs consist of costs associated with the writing and enforcing of contracts with customers and suppliers as well as search, communication and transportation activities associated with acquiring inputs or distributing output products (Dewan et al., 1998; Hitt, 1999).

IT can help reduce coordination costs by improving the speed and quality of information processing, thus facilitating better information communication (Chari et al., 2009). At the same time, IT can also provide management with the ability to reduce agency costs through improved monitoring capabilities and performance evaluation scheme (Gurbaxani & Whang, 1991). In addition, IT investments have potential to help firms reduce production costs, which are all expenses other than internal and external coordination (Aral & Weill, 2007).

Previous research has analyzed coordination needs to investigate the impacts of variation in firm structure on IT investment demands. The basic premise is that organization structures that are more coordination or control intensive also have a higher demand for information processing and IT. Since IT plays a critical role in facilitating these information processing needs, IT demands will rise with increased coordination and control requirements (Dewan et al., 1998; Ray et al.,

2009). Thus, the impacts of IT on firm performance are expected to improve with greater coordination and control demand.

Vertical mergers might help firms reduce external coordination costs. However, much of this external coordination is reduced at the expense of new internal coordination in terms of information sharing, communication, etc. Therefore, the need for IT doesn't seem to reduce as coordination demands are not reduced. However, firms decide to engage in vertical might be able to invest in IT that help coordinate activities and achieve reduction in costs such as reduced inventories or faster reaction time (Clemons & Row, 1991), and these costs reduction might be greater than increased investments in technology to enable them.

As firms engage in horizontal mergers, they are more likely to expand their activities, rather than internalize previously external transactions (Dewan et al., 1998; Capron et al., 2001). Therefore, they are more likely to have to handle increased coordination and information processing demand. This comes from increased internal coordination requirements as firms have to manage more complex and diverse activities. IT investments and initiatives have potential to help reduce coordination and information processing costs (Hitt, 1999; Ravichandran et al., 2009). The above arguments suggest that as firms engage in more mergers, I would expect to see an increased level of investments in IT resources and such increase of IT resources will help firms maximize potential business benefits from their mergers, help them improve firm performance. Thus I propose:

***Proposition 1 The impacts of IT resources investments on firm performance will be greater for firms engaging in greater levels of mergers.***

### ***Performance Impacts of Different Types of IT Resources***

As greater IT resources will improve firm performance for firms engaging in M&As, the performance impacts of different types of IT resources are expected to vary with different types of mergers. In the following section, I will develop arguments for the variation in performance impacts of different types of IT resources in different types of mergers.

#### ***Vertical Mergers***

Lubatkin (1983) suggests that vertical mergers will most likely benefit from the schedule economies where two levels of production at two stages of a value chain are merged. In order to gain the efficiency and effectiveness between the two units in the value chain, processes can be automated by IT applications and systems which cannot be done before the merger. By automating repetitive business processes and substituting labor, automate IT resources focus directly on enhancing work processes associated with value chain activities. Therefore, firms engage in vertical mergers are most likely to observe benefits gained from investments in automate IT resources. Therefore:

***Proposition 2: The impacts of automate IT resources investments on firm performance will be greater for firms engaging in greater levels of vertical mergers.***



### ***Related Horizontal Mergers vs. Unrelated Horizontal Mergers***

Except for conglomerate mergers, where two firms with totally different resources and product markets are merged, horizontal mergers result in two participating firms becoming interdependent. In Thompson's (1967) model, three types of interdependence between different parts of an organization are suggested: 1) *Pooled*: Each part renders a discrete contribution to the whole and each is supported by the whole; 2) *Sequential*: one part must act properly before another part can act, the output of one part is the input for another one, this is the description of traditional supply chain.; and 3) *Reciprocal*: outputs of each part become inputs for another. Thompson proposes that the three types of interdependence have increasing demand for coordination costs. It is arguable that pooled interdependence is incurred by un-related mergers, while reciprocal interdependence is incurred by related mergers (e.g. Dewan et al., 1998; Chari et al., 2008). Therefore, related horizontal mergers would benefit more from greater investments in IT resources. Hence:

***Proposition 3: The impacts of IT resources investments on firm performance will be greater in related mergers than in unrelated mergers.***

### ***Related Horizontal Mergers***

The major benefits that firms gain from related mergers are by exploiting economies of scale and scope (Hill & Hoskisson, 1987; Clemens & Row, 1991; Capron, 1999). Research has relied on taking cost efficiency theories to argue for the potential benefits gained from related horizontal mergers (Capron, 1999). Cost-based synergies in related mergers are gained by coordinating similar resources across the newly merged firms. For example, by integrating two similar business lines, a firm can increase its bargaining power of supplies, eventually leading to reduced costs. Exploiting similar resources across business lines would also help firms improve resources utilization, or spreading fixed costs over a higher total volume. Hence, a significant portion of synergies gained from related horizontal mergers come from coordinating activities closely tied to the value chains of the two newly merged firms, integrating the two value chains together. By automating business processes of the two merged firms, automate IT resources can facilitate the integration of these activities.

Firms engaged in a related merger are reciprocally interdependent after the merger. Therefore, they rely on mutual adjustment for coordination, which requires continuous and intensive communication among parties involved (Thompson, 1967). In addition, in order to be able to exploit similar resources across business lines, the newly merged firm needs an extensive level of information exchange to coordinate the activities based on two similar platforms of the two merged firms (Chari et al., 2008). For example, intensive information exchange is required in coordinating procurement activities across the two business lines. Consequently, firms engaged in related mergers have greater demand for technologies that support communications among them. By providing information up and down the decision making hierarchy, informate IT resources provide capabilities that facilitate firms' exchange of extensive information during these coordination processes, helping firms improve decision and coordination processes, with associated effects expressed in increased effectiveness, improved decision quality, and improved resource utilization (Mooney et al. 1996). The above arguments combined leads to:

**Proposition 4:** *The impacts of automate and informate IT resources investments on firm performance will be greater for firms engaging in greater levels of related horizontal mergers.*

### **Unrelated Horizontal Mergers**

While research on horizontal acquisitions tend to pay more attention on cost-based synergies and argue for the better benefits of related mergers compared to unrelated mergers, unrelated merger integration also has potential to bring about synergies and long-term benefits for the acquiring firms. While firms engaged in related mergers mainly draw their benefits from coordinating similar resources across different business lines, firms engaged in unrelated mergers can gain benefits from revenue-based synergies. Revenue-enhanced synergies are theoretically developed based on the resource-based view, and are gained by increased market coverage and enhanced innovation capability (Capron, 1999). Resources in firms engaged in an unrelated merger are less likely similar, but more likely complementary. Reconfiguring and combining complementary resources can help firms gain strategic advantage and increase their revenues by creating newly-added value to the existing product, e.g. via cross-selling or product bundling, as well as creating totally new product classes, helping firms move into different product-markets (Clemens & Row, 1991; Capron, 1999).

The exploitation of revenue-based synergies in mergers is usually achieved through resource redeployment, which requires reconfiguration of target's and acquirer's business (Capron, 1999; Capron et al., 2001). However, identifying resources that can be exploited with unrelated horizontal mergers is problematic given the great variety of resources available (Clemens & Row, 1991). Therefore, greater levels of interaction and coordination among the two merged firms are required for the employees and management to "learn" how to use the newly acquired resources and combine them effectively with the acquiring firm's resources to create new value. This would require various collaborating mechanisms such as cross-posting of staffs, joint management of shared functions, etc. (Capron, 1999). By providing information that enable collaboration and decision making, informate IT resources possess potential to enable the discussed collaboration processes and mechanisms that help firms "learn" how to exploit their newly merged complementary resources.

Besides cross-selling and bundled products, the newly merged firm can innovate based on redeployment, reconfiguration, and integration of newly merged complementary resources to enhance product features, create new product classes that help the firm move to new product markets and increase revenue. Such innovation activities might require radical changes in business processes and relationships. By focusing on innovating within existing and new product-markets and on the reengineering of business practices and processes, transform IT resources bring about radical changes to business models enable the firm to enter new produce-market regimes (Dehning et al. 2003, Aral & Weill, 2007). Therefore, I propose:

**Proposition 5:** *The impacts of informate and transform IT resources investments on firm performance will be greater for firms engaging in greater levels of unrelated horizontal mergers.*

## CONCLUSION

While IT and IT-dependent synergies has been cited as an important factor influencing post-merger success, little research has examined the relationships between investments in different types of IT resources and firm performance in the context of M&A. In this research, I develop a research model and propositions that provide further theoretical insight on the post-merger firm performance impacts of different types of IT resources for firms adopting growth strategy via different types of M&A. I contribute to accumulated knowledge on the impacts of IT resources on firm performance for firms adopting growth strategy via M&A. First, I show that for firms adopting growth strategy via mergers and acquisition, IT plays an important role in enabling them to maximize synergy from the mergers and improve firm performance. Additionally, different types of IT resources are expected to have differential impacts on firm performance depending on which type of M&A that the firms adopt. My research provides a theoretical framework that help guide future research and management practices in aligning IT strategy and M&A strategy to help firms maximize potential synergy from their mergers and improve firm performance.

### *Implications for Future Research*

While IT has been recognized as having significant potential contribution to improving post-merger firm performance, little research has examined such important issue. My research provides a framework that help guide and encourage future research to examine IT's contribution to post-merger firm performance. Instead of examining IT at the highly-aggregated level, future research needs to examine distinct types of IT resources since they would have differential impacts on post-merger firm performance due to their distinct nature. Further, my arguments have been developed into testable propositions that could be validated in future empirical research with regards to business performance impacts of distinct types of IT resources.

Strategic management research and strategic IT management research also need to be aware of the potential impacts of distinct types of IT resources on post-merger performance. Therefore, research on mergers and acquisition needs to pay more attention to the role of IT resources within merger context in devising strategies that help firms maximize potential synergies from the mergers they engage in.

### *Implications for Management Practice*

My research also has implication for management practice. IT has been suggested to accomplish two important goals in M&A: 1) IT is responsible for the merger of the two IT functions, including the integration of the infrastructure and rationalizing the application portfolio; and 2) the IT function must develop IT strategy that enable the business strategies of the merged firm, enabling the firm to maximize potential benefits gained from the merger. A recent study by Booz Allen Hamilton (Cooke, DeNatale, Razvi, & Sen, 2005) shows that while most IT executives are comfortable accomplishing the first goal, they have much less experience accomplishing the second goal.

My framework help managers infer that for firms engaging in M&A as a growth strategy, greater investments in IT resources may be justified by greater performance. Additionally, IT

investment decisions will have to be made in light of the type of mergers that firms engage in. Therefore, close collaboration among business and IT managers are necessary to devise appropriate strategy for developing IT resources that will enable firms maximize potential benefit from their mergers.

I hope that this research will attract more attention, both theoretical and empirical, on the role of IT in M&A context.

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