



DO IT HELPS SMES GAIN BETTER PERFORMANCE: A CONCEPTUAL ANALYSIS ON RBV THEORY

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ABSTRACT

Nowadays, competition is everywhere in the business environment. The survival of Small and medium-sized enterprises (SMEs) depend on their ability to take full advantage of the resources available. Prior research had identified that IT is an important resource to the success of the firms. However, despite the common consensus that IT influences firm's performance, results of previous studies on the effect of IT resources on firm's performance are often inconsistent. Given these inconsistent results, it is unclear whether any direct effect exists between IT resources in organizations and their firm's performance. For that reason, several authors highlighted the need for more research to investigate the impact of IT adoption on the firm's performance. In response to this, this conceptual paper attempts to analyze relevant literatures on whether IT investment would help firms gain better performance. Understanding whether and how IT has affected firm's performance is an important research issue as it allows the firms to know the value of IT investment and whether such innovation is worth to be adopted. Grounding in RBV theory, this study concluded that the combination of IT assets and IT capabilities (IT infrastructure) provides competitive advantage to the firm. This study also suggested that SMEs that adopt IT would perform better than those that do not adopt IT. This conceptual analysis is hoped to consolidate the body of knowledge in the area and significant to the researchers as it directs to the hypotheses development for future research.

Keywords: Information technology, RBV theory, Resources, Capabilities, IT infrastructure, Firm's performance, SMEs.

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1. INTRODUCTION

Nowadays, competition is everywhere in the business environment. How to survive the challenges of a changing environment and competition is a critical question for Small and medium-sized enterprises (SMEs). Compared to large companies, SMEs have limited resources and little influence on the market (Rohde, 2004; Kouser *et al.*, 2011). Their survival depends on

their ability to take full advantage of the resources available and promptly find and adjust to a market niche (Zhang *et al.*, 2009). According to Rohde (2004), SMEs have simpler, more centralized decision-making structures and rely more heavily on short-term planning compared to larger firms.

Therefore, wise decision-making is very crucial to the success of the firms (Fadhil and Fadhil, 2010). Sian and Roberts (2009) suggested that managers need to have effective financial management as well as information technology (IT) as a tool to help them make effective decisions.

Theoretically, prior research had identified that computers and software programs are business tools, which could be used to reduce production and labour costs (Nguyen, 2009), innovate and facilitate niche marketing, increase productivity and effectiveness (Gullkvist, 2002), increase efficiency of internal business operations (Chatterjee *et al.*, 2002; Tan, 2010), become more innovative and even to gain competitive advantage (Thong, 1999; Nguyen, 2009; Shabanesfahani and Tabrizi, 2012). Other benefits include connecting SMEs to external contacts such as other related businesses, stakeholders and institutions and networking with other parties more easily and cheaply. However, the most important features of IT are high speed data processing, extremely high accuracy, and high speed access to information (Salehi and Abdipour, 2011). Consequently, advancement in IT had increased the ability of organizations to make good business decisions based on large amounts of data and the speed in which information is produced by their enterprise (Ismail, 2009).

2. DEFINITION OF INFORMATION TECHNOLOGY

The definition of what is included as part of IT varies between studies depending on the area of research. Shabanesfahani and Tabrizi (2012) referred to IT as a field of engineering, which is derived from a combination of computers and telecommunication science and employed in stores in order to retrieve, transmit and manipulate data.

Kamal (2006) and Smith (1999) defined IT from a more pragmatic and technological perspective. Kamal (2006) considered IT as technology used to collect, store, process, graphically display and transport data, and therefore encompasses computer equipment and system programs, application programs and communication facilities. Rather similarly, Smith (1999) defined IT as devices used by businesses to transmit, store and process information.

Powell and Dent-Micallef (1997) and Gaith *et al.* (2009) relate to IT as a technological instrument. Powell and Dent-Micallef (1997) referred to IT as any form of computer-based information system, including mainframe as well as microcomputer applications. For Gaith *et al.* (2009), IT is a combination of hardware, software, telecommunications and office equipment to transform raw data into useful information for speedy retrieval.

From the above definitions, it could be concluded that IT is a technological instrument, which is used to record, process and transform data into useful information. Many researchers agree that the increased use of IT has brought numerous changes to the business world

particularly in the way businesses are being operated (Gullkvist, 2002; Alam, 2009; Kharuddin *et al.*, 2010; Elbarrad, 2012). Furthermore, on the macro level, governments in most countries seem to trust the use of IT as being capable of enhancing the progress of a country's economy both domestically and internationally (Shabanesfahani and Tabrizi, 2012). As a result, since more than three decades ago, many researchers had studied various aspects of IT investment and its benefits towards businesses and firms.

For example, Smith (1999) studied 150 SMEs in Scotland to describe the use of IT and its perceived importance in the early stages of the firm's life cycle. The empirical results show that the use of IT to transmit, store and process information in the small firm increases in importance over time. The study also found that those firms which are the greatest users of IT in the very early stages subsequently experience enhanced performance, due to the competitive advantage gained through their superior grasp of information that they begin to experience over their rivals who had failed to get on board and exploit the new systems of IT.

A study by Devaraj and Kohli (2003) on 8 hospitals in the US showed that technology usage was positively and significantly associated with financial performance. The study also indicated that the main impact of IT is not on the investment in the technology, but the actual utilization of the technology. Therefore, they suggested that "actual utilization" might be a key variable in explaining the impact of technology on performance. This is supported by Kumar *et al.* (2011) study on the antecedents and effects of IT usage on firm's performance in India, which has shown strong statistical relationships between actual IT usage and firm's performance.

A study by Perez-Arostegui *et al.* (2011) on 230 firms in Spain analyzed the impact of IT competence on quality performance. The results showed that IT competence, which is composed of flexible IT infrastructure, IT managerial knowledge and integration of IT strategy with the firm's strategy, all had a positive and direct impact on quality performance and thus also on competitive advantage.

In Malaysia, the findings by Gaith *et al.* (2009) on the Malaysian construction industry indicated that firm's performance was related to the level of investment in information technology. Hence, investment in sophisticated IT is now considered fundamental for firms of all sizes to support, sustain and grow in the business (Ismail and King, 2007).

Despite the common consensus that computerization influences firm's performance, assessing the impact of IT investment on firm's performance is problematic. Furthermore, although a large number of papers related to this approach have been published, the findings are inconclusive (Liang *et al.*, 2010). This means that despite a considerable amount of empirical research, results of IT resources on firm's performance are often inconsistent. In addition, the weak relationship between IT investment and financial performance even leads researchers to challenge the effects of IT on performance.

For example, several previous studies had shown a positive relationship between IT adoption and firm's performance (DeLone, 1988; Mahmood and Mann, 1993; Liang *et al.*, 2010; Chong *et al.*, 2011; Kumar *et al.*, 2011). The results of Ramanathan *et al.* (2012a) on a study in Taiwan

confirmed that the effects of e-commerce on operations helps larger firms and SMEs to perform better. Brynjolfsson and Hitt (1996) found that IT investment contributed significantly to firm-level output even when considering depreciation and measurement errors. They insisted that IT spending had made substantial and statistically significant contributions to the firm's output. Shin (2006) concluded that there existed a positive impact of IT on financial performance of most companies in his research with budget data of diverse firms from 1995 to 1997.

On the other hand, other studies showed negative results between IT capability and organizational performance. Kivijarvi and Saarinen (1995) revealed that a heavy investment in IT does not guarantee profitability. Li and Ye (1999) found that IT investment was not statistically significant in improving profitability, as measured by return on assets (ROA) and return on sales (ROS). Liang *et al.* (2010) had shown that the direct effect of IT does not affect firm's performance. Ray *et al.* (2005) also found that there were no direct effects of three different IT resources (technical skills of IT unit, manager's technology know-how, and IT spending) on the performance of the customer service process. Lin and Chen (2007) study on Taiwanese SMEs support these findings by observing a weak link between innovation and firm's performance as measured by the number or amount of sales. While a study by Aral and Weill (2007) involving 147 U.S firms from 1999 to 2002 demonstrated that IT investment was not associated with firm's performance. Given these inconsistent results, it is unclear whether any direct effect exists between IT resources in organizations and their firm's performance. For that reason, several authors highlighted the need for more research to investigate the impact of IT adoption on the firm's performance (Mahmood and Mann, 1993; Melville *et al.*, 2004; Chari *et al.*, 2008; Liang *et al.*, 2010; Ramanathan *et al.*, 2012b). In response to this, this study tried to explore this issue by analyzing the literatures whether IT investment would help firms in gaining better performance.

Understanding whether and how IT has affected firm's performance is an important research issue as it allows the organization to know the value of IT investment Liang *et al.* (2010). This study also significant for the researchers as it directs to the development of hypotheses for future research.

Many theoretical frameworks have sought to explain IT impact on organizational performance. An early study is Porter and Millar (1985) seminal work on the value chain, where information has the ability to provide value in each link of a firm's value chain (Jacks *et al.*, 2011). However, the review of literature shows that Resource-based View (RBV) is the major theory that has been adopted by prior researchers to interpret the relationship between IT and firm's performance (Bharadwaj, 2000; Hulland *et al.*, 2007; Byrd *et al.*, 2008; Salwani *et al.*, 2009; Liang *et al.*, 2010; Jacks *et al.*, 2011; Ramanathan *et al.*, 2012a). Moreover some studies (Zhu and Kraemer, 2005; Salwani *et al.*, 2009; Ismail *et al.*, 2013) have attempted to integrate the other theories such as Technological-Organizational-Environmental (TOE) framework and Diffusion of Innovation (DOI) theory with the RBV theory as their conceptual model to assess the use and value of IT in organizations. At this point of view, the RBV theory is deemed to be useful when studying the

value of computerization or IT investment because it provides a framework to show how IT are related to the strategy and the performance of a firm (Mata *et al.*, 1995).

3. THEORETICAL BACKGROUND: RESOURCE-BASED VIEW (RBV)

RBV is a theory that links the performance of organizations to resources and capabilities. The RBV approach was first introduced by Wernerfelt (1984) and it was further expanded by Barney (1986). According to Aragon-Sanchez and Sanchez-Marin (2005), the RBV complements the traditional model of Porter's competitive advantage. However, Azevedo and Ferreira (2009) argued that the RBV approach, however, is rather linked to the pioneering work of Penrose (1959).

Basically, RBV describes a firm in terms of the resources that the firm integrates. Firms differ from each other as each firm has its own resources is the central premise of RBV theory.

Therefore, the application of RBV can help in explaining why some firms consistently outperform others (Barney *et al.*, 2001).

In literature, resources have been defined in number of ways. According to Wernerfelt (1984), resources mean anything that could be thought of as a strength or weakness of a given firm. More formally, Wernerfelt (1984) defined a firm's resources as those (tangible and intangible) assets that are tied semi-permanently to the firm. Examples of resources are brand names, in-house knowledge of technology, skilled personnel, trade contacts, machinery, efficient procedures, and capital.

Capron and Hulland (1999), define resources as stocks of knowledge, physical assets, human capital, and other tangible and intangible factors that a business owns and controls, which enables a firm to produce, efficiently and/or effectively, market offerings that have value for market segments.

By extending Capron and Hulland (1999) definition, Milfelner *et al.* (2008) defined resources as any attribute, tangible or intangible, physical and human, intellectual or relational that can be deployed by a company, enabling it to produce, efficiently and/or effectively, a market offering that has value for some market segments.

Barney (1991) defined resources as tangible and intangible assets that organizations use to choose and implement strategies. Firm resources include all assets, capabilities, organizational process, firm attributes, information, and knowledge controlled by a firm that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness (Barney, 1991).

Barney (1991) then classified resources into 3 categories: Physical Capital Resources; Human Capital Resources and Organizational Resources. Physical resources include physical technology used in a firm, a firm's plant and equipment, its geographic location and its access to raw materials.

Human capital resources include the training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in a firm. Organizational capital resources include a firm's formal reporting structure, its formal and informal planning,

controlling and coordinating systems, as well as informal relations among groups within a firm and between a firm and those in its environment.

However, a subsequent distinction made by Amit and Schoemaker (1993) has been widely adopted throughout the RBV literatures (Bharadwaj, 2000; Lerner and Almor, 2002; O'Regan and Ghobadian, 2004; Aragon-Sanchez and Sanchez-Marin, 2005; Ismail *et al.*, 2013). Amit and Schoemaker (1993) have split up the resources into resources and capabilities. They defined resources as stocks of available factors that are owned or controlled by the firm. Resources are converted into final products or services by using a wide range of other firm assets and bonding mechanisms such as technology, management information systems, incentive systems, trust between management and labor, and much more. Capabilities, in contrast, refer to a firm's capacity to deploy resources, usually in combination, using organizational processes, to affect a desired end. The characteristics of the resources are tradable and non-specific to the firm Amit and Schoemaker (1993); for example, plan, equipment, capital, material and human resource. Compared to resources, the characteristics of capabilities are firm-specific, non-transferable and often developed over a long time by combining physical, human and technological resources (Amit and Schoemaker, 1993) such as skill, advertising, product range, design and brand name.

Azevedo and Ferreira (2009) simplified the definition of resources and capabilities by defining resources as inputs into the production process and the basic units of analysis while capability as the capacity for a team of resources to perform some task or activity. While resources are the source of the firm's capabilities, capabilities are the main source of its competitive advantage (Azevedo and Ferreira, 2009).

Although Barney *et al.* (2001) argued that this distinction can only be drawn in theory and is quite confusing in practice, in line with other studies (Bharadwaj, 2000; Lerner and Almor, 2002; O'Regan and Ghobadian, 2004; Aragon-Sanchez and Sanchez-Marin, 2005), Amit and Schoemaker (1993) categorization is used in order to operationalize the IT resources in this study as it seems to help provide a better understanding of issues pertaining to IT.

4. THE RESOURCE-BASED THEORY OF IT

The RBV has been used to examine the efficiency and competitive advantage implications of firm specific resources such as entrepreneurship, culture and organizational routines (Melville *et al.*, 2004). It is also useful in the IT context (Bharadwaj, 2000). Many studies therefore have applied RBV to theoretically analyze the implications of information technology on firm's performance (Bharadwaj, 2000; Hulland *et al.*, 2007; Byrd *et al.*, 2008; Salwani *et al.*, 2009; Liang *et al.*, 2010; Jacks *et al.*, 2011; Ramanathan *et al.*, 2012a) and to assess empirically the complementary nature between IT and other firm resources (Powell and Dent-Micallef, 1997).

RBV states that firms possess resources, and some of these resources help the firm achieve competitive advantage (Barney *et al.*, 2001). This means that not all resources provide a firm with competitive advantage. Barney *et al.* (2001) stated that the resources should possess four qualities

in order to gain competitive advantage comprise of valuable, rare, imperfectly imitable, and non-substitutable. Table 1 gives the definition of the four attributes.

Table-1. Definition of resources attributes that create competitive advantage (Barney *et al.*, 2001).

Attribute	Definition
Valuable	-refers to the ability of an organizational resource to support strategies intended to capitalize on market opportunities or fend off threats
Rare	-is a measure of the relative unavailability of an organizational resource to current and potential rivals.
Imperfectly imitable	-is a reflection of the costs and difficulties associated with attempts to duplicate an organizational resource.
Non-substitutable	-is a property that evaluates the non existence of strategically equivalent organizational resources

From the definitions in Table 1, one can say that the resources can create competitive advantage when they enable firms to exploit opportunities or neutralize threats from the environment to improve its efficiency or effectiveness (valuable). They also should not be possessed by a large number of competing firms (rare), should not be easily imitated (imperfectly imitable) and should not be replaced by other substitutes (non-substitutable) (Liang *et al.*, 2010).

Many researchers have argued that due to their fungible nature, IT resources do not embody the four properties (valuable, rare, imperfectly imitable, and non-substitutable) and thus are unable to affect sustainable competitive advantage (Mata *et al.*, 1995). Although some IT assets are customizable, and as such may not be regarded as completely undifferentiated, they are still considered commodities since they are not protected by isolating mechanisms (Ray *et al.*, 2005). In RBV studies, resources have been sometimes termed as assets, therefore IT resources and IT assets are usually used interchangeably in many RBV studies (Mata *et al.*, 1995; Ray *et al.*, 2005).

Previous discussions mentioned that there are two types of firm resources, namely resources and capabilities (Amit and Schoemaker, 1993). In regards to IT resources, Barney (1991) specifically pointed out that physical technology or information management systems, no matter how complex they are, are not considered resources that create sustainable competitive advantage, since they are generally imitable. Other firms will be able to purchase the same technology or information management system. Wade and Hulland (2004) stated that IT assets are the easiest resources for competitors to copy and therefore represent the most fragile source of sustained competitive advantage. For that reason, many researchers (Mata *et al.*, 1995; Ross *et al.*, 1996; Bharadwaj, 2000; Barney *et al.*, 2001; Santhanam and Hartono, 2003; Wade and Hulland, 2004; Zhu, 2004; Ray *et al.*, 2005; Rai *et al.*, 2006; Liang *et al.*, 2010; Nevo and Wade, 2010) agree that investment in IT per se does not provide any competitive advantage.

Barua *et al.* (2004) suggested that compared to IT assets, capabilities that are firm specific, deeply embedded within an organization and are not easily transferable. Other researchers (Ross *et al.*, 1996; Wade and Hulland, 2004; Zhang *et al.*, 2009) also agreed that in contrast to IT assets, the firm's specific capabilities such as users experiences, skills and frequency of use that are developed over time can contribute to sustainable competitive advantage.

As for technical skills, although some study's (Bharadwaj, 2000; Barua *et al.*, 2004) suggest that skills are some sort of capability, which is specific to the firm and could gain competitive advantage, Ray *et al.* (2005) argue that skill itself cannot give any variance in performance between competing firms. According to Ray *et al.* (2005), technical IT skills refers to general, explicit skills (e.g., programming), possessed by the firm's IT staff that are needed to develop IT applications. While these skills can be very valuable, since they are widely available to firms (through either hiring employees or consultants with these skills) they are usually not rare or costly to imitate, and thus such skills, by themselves, are not likely to explain variance in the performance of the competing firms. Moreover, as Mata *et al.* (1995) noted, even when such skills are heterogeneously distributed across firms, they are typically mobile as it is not difficult for competitors to hire away this value-creating resource from their competitors at their market price.

This argument is consistent with findings of Ray *et al.* (2005) on 72 firms in the insurance industry in the US that found technical IT skills, generic information technology and IT spending by itself did not explain significant variance in performance. However, when these capabilities were moderated by shared knowledge, generic information technology and IT spending did affect the performance variance between firms. Khiang *et al.* (2003) emphasized that no matter how advanced the technology, it still needs people to develop, manage and use it creatively.

Thus, many RBV researchers agree that by combining organizational capabilities or other organizational resources with IT assets, organizations can create new resources with enhanced strategic potentials (Mata *et al.*, 1995; Bharadwaj, 2000; Chatterjee *et al.*, 2002; Ray *et al.*, 2005; Nevo and Wade, 2010). The researchers agree that although the individual components (i.e. the process, standards, skill sets, tools, and technologies) that constitute the platform are potentially replicable, the composite mix of these components is unique to a firm's context and difficult to imitate (Chatterjee *et al.*, 2002). Furthermore, a meta-analysis study by Liang *et al.* (2010) on 50 papers published in major research journals provided empirical evidence when they found that the mediated model that included organizational capabilities as mediators between organizational resources and firm's performance could better explain the value of IT than the direct-effect model without organizational capabilities. The findings provided strong evidence that IT had contributed to firm's performance through strengthening organizational capabilities. In other words, firm's performance is enhanced by the integration and synergy between organizational capabilities and IT resources. As such, many of RBV – IT performance research to date has examined IS resources in the context of combining IS assets and IS capabilities (Ross *et al.*, 1996; Powell and Dent-Micallef, 1997; Bharadwaj, 2000; Santhanam and Hartono, 2003; Zhang, 2007; Byrd *et al.*, 2008; Zhu, 2009). Some researchers (Bharadwaj, 2000; Chatterjee *et al.*, 2002; Ray *et al.*, 2005; Kamal, 2006; Byrd *et al.*, 2008; Zhang *et al.*, 2009) referred to a combination of IT assets and capabilities as IT infrastructure. Byrd *et al.* (2008) characterized IT infrastructure as a combination of IT assets (hardware and software) and IT capabilities (IT skills and business

application integration). [Byrd et al. \(2008\)](#) argued that IT infrastructure might lead to better intermediate performance as well as better organizational performance.

5. CONCLUSION

The above discussion indicates that many previous studies agreed that although IT assets could be purchased or duplicated fairly easily by competitors, a combination of 'IT assets and IT capabilities' or 'IT infrastructure' has all the characteristics of becoming a unique resource that is difficult to imitate. This means that despite considerable investments in technology, IT assets and skills tend to be heterogeneously distributed across firms, leading to different patterns of IT use and effectiveness ([Bharadwaj, 2000](#)). Therefore, IS researchers have adopted RBV theory to study how IT helps firm's gain better performance by treating certain IT infrastructure as rare and valuable.

For example, although numerous hardware and software related to IT are available in the market and this makes them easy targets for imitation by competitors, but RBV would argue that the way in which firm's use these readily available technologies make it inimitable. Thus, the inimitability is usually based on other complementary and human resource capabilities existing in a firm ([Ramanathan et al., 2012a](#)). [Ramanathan et al. \(2012a\)](#) have made empirical observations in many research studies and found that the impact of technological innovation could vary depending on other characteristics of the firm such as environmental uncertainty, employee training, technological capability, the firm's size and experience in using the technology. All of these resources and capabilities could affect how firms take advantage of technological innovation adoptions. Therefore, the continued accumulation of knowledge in a firm through innovative use of IT infrastructure provides competitive advantage to the firm.

Previous discussions also described that IT spending itself cannot explain significant variance in performance. Although most of the RBV researchers agreed that generic IT itself cannot have an impact on competitive advantage since most firms have access to the same technology, it is unlikely to be able to explain variance in performance across competing firms. Such technologies may still be valuable in an absolute sense. [Ray et al. \(2005\)](#) pointed out that at least investing in these technologies could enhance performance of the firm compared to those without these technologies. [Chong et al. \(2011\)](#) believed that firms that do focus on innovation would lead to better organizational performance. Study by [Hamilton and Asundi \(2008\)](#) in Puerto-Rico examined if firms that invested in IT and innovation were more profitable than those that did not. Their studies found that firms that invested in IT tend to grow more than those not investing in IT.

Several other studies have also shown that IT may indeed contribute to the improvement of organizational performance ([DeLone, 1988](#); [Smith, 1999](#); [Devaraj and Kohli, 2003](#); [Rajendran and Vivekanandan, 2008](#); [Kharuddin et al., 2010](#)).

The results of previous studies also have shown some support for the idea that IT could help SMEs to gain business efficiency and firm's performance. Although there is little IT research

towards adoption in SMEs, these studies have struggled to show a direct impact of IT on SMEs performance. For the benefits IT could provide to the firms, this study therefore believed that SMEs that adopt IT would perform better than those that do not adopt IT.

6. LIMITATION AND FUTURE RESEARCH DIRECTIONS

Grounding in RBV theory, this conceptual paper attempts to analyze relevant literatures on whether IT investment would help firms especially SMEs gain better performance. Although the conclusion has been proposed, the argument in this study is needed to be empirically validated. Based on the literature and suggestion in this study, relevant hypotheses could be developed to be tested in future research. Such test is important to provide empirical evidence that the adoption of IT could affect the firm's performance and prove that there are differences between adopters and non-adopters' of IT in term of firm's performance. This research therefore, could be of interest to SMEs owner-manager or those seeking to adopt IT, the policy makers and researchers.

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