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Hanan Maoz

Tel-Aviv University, Israel, maozh@bgu.ac.il

Tsipi Heart

Ben-Gurion University of the Negev, Israel, heart@bgu.ac.il

David Gefen

Drexel University, USA, gefend@drexel.edu

Nava Pliskin

Ben-Gurion University of the Negev, Israel, pliskinn@bgu.ac.il

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FROM IT ASSETS TO BUSINESS AND ECONOMIC VALUE

Hanan Maoz¹, Tsipi Heart², David Gefen³, Nava Pliskin²

¹Department of Industrial Engineering, Tel-Aviv University

²Department of Industrial Engineering & Management, Ben-Gurion University of the Negev

³ LeBow College of Business, Drexel University

Research in Progress

Abstract

This study conceptually develops a Business Value of IT (BVIT) model, conjointly and innovatively using four theoretical frameworks, the Resource-Based View (RBV) of the firm, Knowledge-Based View (KBV), Contingency theory, and the Strategic Alignment Model. The developed model proposes that IT-enabled knowledge and communication capabilities, which actually create IT-enabled economic value (EVIT), can be driven by organizational strategy and resources via their impact on IT strategy and resources. The study contributes to the extant body of knowledge by developing three new IT-driven business value constructs: Know-Tech, Com-Tech, and EVIT along with theoretical grounding and implications about empirical measurements. It is thus suggested that IT-enabled knowledge and communication capabilities mediate the effects of organizational and IT strategies and resources on EVIT, thereby illustrating the paths that lead from IT components to IT-embedded capabilities and to EVIT. The model implies that IT matters in modern knowledge-based turbulent and dynamic competitive environments by contributing to the acquisition of organizational IT-Embedded knowledge and communication capabilities that can drive sustainable economic value. The proposed model also shows the paths by which IT contributes to eventual organizational economic gains albeit indirectly through deeply embedded, inimitable, dynamic and valuable organizational knowledge and communication capabilities. This research paves the way to an empirical investigation of 'IT-Embeddedness' as recently called for by scholars.

Keywords: Business value of IT (BVIT), Economic value of IT (EVIT), IT strategy, IT resources, Organizational strategy, Organizational resources

1 INTRODUCTION

The term 'business value of information technology' (BVIT), which refers to the impacts of IT on organizational performance, has been the focus of research in the last two decades and has been subject to significant debate (e.g. DeLone and McLean, 1992; Seddon, 1977; Wade and Hulland, 2004). To date, the BVIT concept is still ambiguously conceptualized and difficult to operationalize.. The extant theoretical frameworks that can successfully explain BVIT creation have limitations when implemented in the context of multifaceted BVIT (intangible and tangible values), as prior research has not met the expectations and need to conquer the 'last mile' of IT value creation by extending this value to economic terms that can be readily converted to monetary equivalence (Kohli and Grover, 2008). Kohli & Grover (2008) point out that since businesses and customers are the final arbitrators of value creation, overemphasizing pure financial post hoc metrics or ex ante market-oriented values, as done in past research, underreports the true benefits of IT. Hence, they argue it is necessary to seek the indirect and intangible paths to economic value influenced by IT-enabled competencies. They further suggest that IT value research should contain as a minimum two types of variables: 1) IT variable or IT management variable, and 2) an endogenous variable with IT economic impact (p. 25).

Thus, addressing their call for new BVIT research directions, the objectives of this research is to conceptually model the impacts of the organizational and IT strategies and resources on BVIT. Empirically examining an extended IT value model with an endogenous variable that reflects the economic impact of IT on the organization's performance, however, is beyond the scope of this paper. The proposed model focuses on the organization as the unit of analysis, aiming mainly to describe processes in larger organizations. It is suggested that the development of this model sheds light on 'IT-Embeddedness' and on the paths via which IT can render business and economic value.

The importance of BVIT and its definition and measurement limitations motivate the first research question of this research: How do relationships among IT and organizational resources and strategies provide the necessary conditions for IT value creation? In addition, a new research thrust in the area of value expansion, which focuses on the indirect and intangible impacts of IT on value creation, leads to the second research question: How does the 'embeddedness' nature of IT create IT-enabled competencies which lead to economic value? The present study deviates from past research which focused on direct economic outcomes (e.g., ROI, market share, and stock price), by proposing indirect paths to economic values. It assumes that BVIT can be concatenated with economic values through attained and sustained values such as IT-enabled competencies and strategic alignment (Maoz, 2009).

The model developed here is anchored conjointly in the Resource-Based View (RBV) theory, the Knowledge-Based View (KBV) theory, the Contingency theory, and the Strategic Alignment Model (SAM) framework. Briefly described in the next section to set the background for the proposed model, RBV and KBV define the multi-faceted model constructs, while paying attention to knowledge-based capabilities and associations, Contingency theory serve to define the contingent relationships among the constructs, and the SAM framework clarifies the heterogeneous relationships of alignments among resources and strategies within an organization.

2 BACKGROUND AND PROPOSED MODEL

According to the Resource-Based View (RBV) theory (Penrose, 1959), IT resources can provide the building blocks for enhancing specific, yet powerful, organizational dynamic capabilities (Amit and Schoemaker, 1993). Although IT resources may be viewed as tangible entities, which are mobile and imitable, they enable unique knowledge and communication routines that are bundled with an organization's imperative for valuable business processes (Wade and Hulland, 2004). Hence, firms

can develop these IT enabled capabilities through multiple paths and independently of other firms to create unique advantage transformed to better performance (Eisenhardt and Martin, 2000).

The Knowledge-Based View (KBV) theory (Kogut and Zander, 1992) stresses that knowledge and communications assets facilitated by IT, enable people to collaborate overcoming geographic and time barriers (Weill, 1992). Special attention has been allotted to KBV in describing the sequence of IT value creation. The IT knowledge 'factory' is embedded and carried out through multiple organizational entities including culture and identity, policies, routines, documents, systems, and employees (Real et al., 2006).

Contingency theory (Weill and Olson, 1989) posits that alignment between “patterns of relevant contextual, structural, and strategic factors” (Doty et al., 1993’, p. 1196) leads to superior firm performance and, conversely, misalignment results in performance erosion. Here, this theory lens has been used to establish a viewpoint on the associations among IT and organizational components (resources and strategies).

In addition, this study relies on the Strategic Alignment Model (SAM) framework (Henderson and Venkatraman, 1993) which models alignment between Business and IT strategies and resources, and the different values accrued by each view.

The BVIT research model (Figure 1) depicts the decomposition of the BVIT concept into two constructs, Know-Tech and Com-Tech, as well as the effect of four other constructs: Organizational-Strategy, IT-Strategy, Organizational-Resources, and IT-Resources. This chain of relationships represents the IT value creation sequence toward the desired economic essence, manifested by the final dependent variable – the Economic Value of IT (EVIT). The model is conceptually developed next.

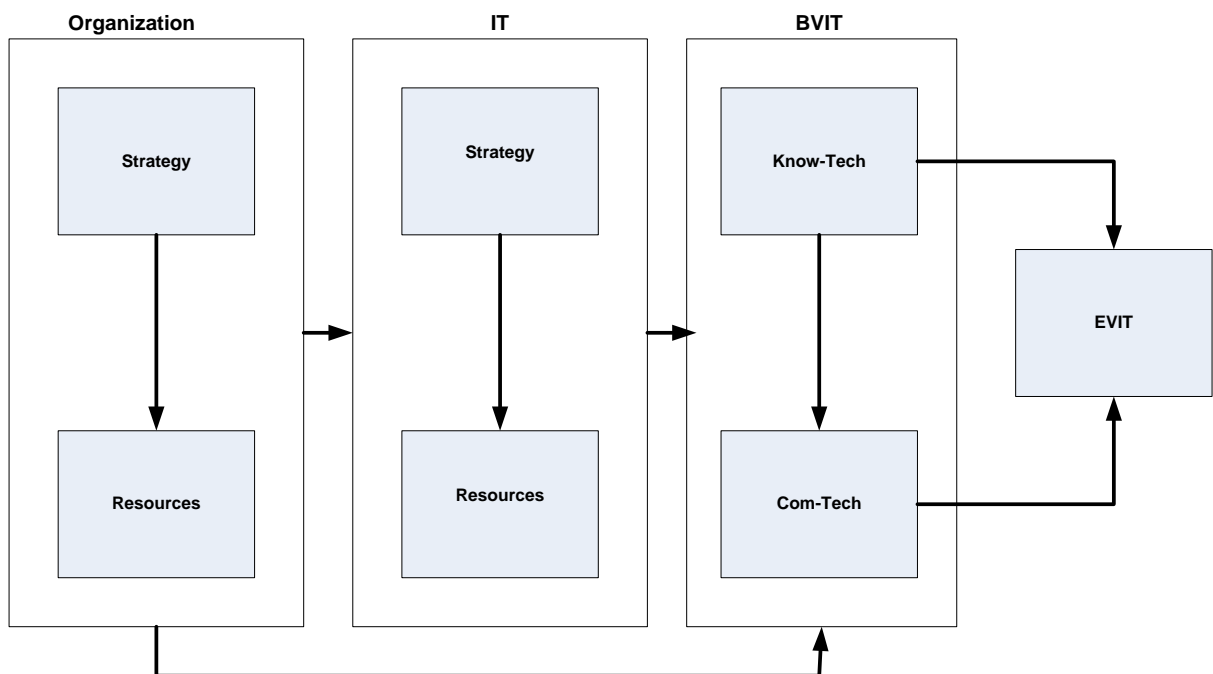


Figure 1. The EVIT Model

3 MODEL DEVELOPMENT

3.1 Economic Value of IT – EVIT

EVIT is defined as the perceived IT contribution to economic performance indicators. It is reflected by perceptions about IT's contribution to the organization's solid and continuous business performance, to market growth via expansion of the product portfolio, to profits, and to the company's valuation above its asset value, as well as by perceptions about IT as a driver of operational profit and revenue growth. According to RBV, when IT is embedded within complex organizational structures it enables innovation and business process re-engineering and influences business performance (Wade and Hulland, 2004), reinforces organizational expansion and growth in terms of product evolution and new market penetration (Barua et al., 1995; Dehning, 2005), drives stable growth in revenues, profits, and shareholder value above the industry average performance (Amit and Schoemaker, 1993; Bharadwaj, 2000; Ross et al., 1996), and enables operational advantages (Bharadwaj, 2000; Dehning and Stratopoulos, 2003; Rivard et al., 2004; Santhanam and Hartono, 2003). IT can thus provide unique dynamic and agile capabilities (Christiaanse and Venkatraman, 2002), which can contribute to achieving predominance-ability, namely, superiority of company performance compared to industry benchmarks (Dehning, 2005; Maoz, 2009; Porter, 1980). As shown in Figure 1, the effect of IT resources and strategy on EVIT should be fully mediated by IT competencies ('Com-Tech' and 'Know-Tech'), which are perceived as the intangible BVIT.

3.2 Com-Tech

Com-Tech is defined as the functional and managerial communication, coordination, and integration capabilities enabled by IT, reflected by: (1) Automation and utilization of resource efficiencies, (2) Information communication and collaboration among functions, and (3) Coordinated processes and re-engineering capacity. Automation is associated with efficient utilization of operational resources to enhance and enlarge existing organizational capabilities (Rockart, 1996). Well-utilized resources achieve a competitive level of communication and collaboration among functions, people, and entities, to improve the firm's overall efficiency (Wade and Hulland, 2004). In the long term, automation can support product and process development, and facilitate innovation (Hitt and Brynjolfsson, 1996; Wade and Hulland, 2004). Information communication or 'Informing' (Radhakrishnan et al., 2008) relates to operational data integration and streamlining among organizational functions. Through dissemination of operational information among business entities, IT facilitates alignment and coordination that leads to operations augmentation in order to attain the organization's business goals (Dehning and Stratopoulos, 2003). The coordinated process re-engineering capacity or 'Transforming' (Radhakrishnan et al., 2008), is about changing patterns of the organization within its value chain, driving innovative processes to support marketing, manufacturing, etc. (Pralahad and Hamel, 1990), transforming relations with suppliers or customers (Goodhue et al., 2002), and establishing low-cost services through resilient IT architecture and governance (Armstrong and Sambamurthy, 1999; Feeny and Willcocks, 1998).

Com-Tech induce economic efficiencies in various ways such as by easing communication across time and geographic location and by offering decision-making efficiencies, including the ability to store and retrieve large amounts of information faster, at lesser cost, and selectively. Argyres (1999) argued that IT-enabled communication reduces the cost of knowledge processing and utilization and the cost of information use, making organizational structures more coordinated and efficient, and enhancing labor productivity. These kinds of IT-enabled gains are usually seen as a principal economic benefit to be gained from the application of IT in organizations. Therefore,

Proposition1: The stronger is the organizational Com-Tech capability, the more is the effect of IT on EVIT.

3.3 Know-Tech

Know-Tech is defined as the dynamic process of knowledge accumulation and retention capabilities enabled by IT, generated as learning practices at the heart of the organization. Organization learning and organizational knowledge accumulation are achieved by embedding processes of knowledge dissemination, by continuous improvement in organizational processes, by generation of flexible knowledgeable resources and services, and by change management activities among knowledge workers. Knowledge accumulation and dissemination are distinctive competencies enabled by IT, which uniquely pertain to the dynamic processes of balancing between exploring new knowledge and exploiting existing knowledge (March, 1991).

Know-Tech represents a heterogeneous attribute of the learning organization (Real et al., 2006) that manages its knowledge base and maintains its learning curves at the individual, group, or organizational levels (Crossan et al., 1999). These activities enable improved business performance and sustainable competitive advantage (Easterby-Smith et al., 2002; Lei et al., 1999). It is hypothesized that Know-Tech positively affects Com-Tech, because knowledge collection, assimilation and codification (Cohen and Levinthal, 1990) provide the prerequisite capabilities for knowledge exchange via communication. It is associated with synergetic effects through information circulation and collaboration. Therefore,

Proposition 2a: A strong organizational Know-Tech capability can render stronger organizational Com-Tech capability.

Know-how is an IT-enabled capability which is tacit, idiosyncratic, and embedded in the organizational social fabric and memory. A firm's knowledge assets are recognized as unique, inimitable, and valuable resource (Matusik and Hill, 1998; Pralahad and Hamel, 1990). Hence, according to RBV theory, these can result in superior performance (Teece, 1997). Firms that are successful in creating superior IT-enabled knowledge enjoy in turn superior financial performance, bolstering revenues and/or decreasing costs. This potential IT-driven advantage has also been suggested by Henderson and Venkatraman (1993', p. 11). The firm's ability to recognize the value of new information, collect, codify, assimilate, and apply it commercially drives its gains of economic benefits (Cohen and Levinthal, 1990). IT promotes this learning. For example, IT may increase the ability to process new knowledge for product development (Nonaka, 1994) and reconfigure existing knowledge to create innovation (Henderson and Clark, 1990). Therefore,

Proposition 2b: The stronger is the organizational Know-Tech capability, the more is the effect of IT on EVIT.

3.4 IT Resources

This study adopts the Henderson and Venkatramna's (1993) definition of the IT-Resources construct, as the formal IT technological architectures, processes, and skills. IT Resources are leveraged under IT policy to provide information systems infrastructure and business applications across the enterprise, including technology services and integration (Wade and Hulland, 2004). Henderson and Venkatraman perceived 'IT Skills', comprised of technical, project, and functional IT resources (Bharadwaj, 2000; Feeny and Willcocks, 1998; Mata et al., 1995; Melville et al., 2004; Ross et al., 1996), as major building blocks in facilitating the contribution of IT Resources to projects and services. Later, this was corroborated and adopted by other researchers (Melville et al., 2004; Ross et al., 1996) as important components of IT resources that drive organizational performance and affect BVIT. Additionally, managerial skills for planning, collaborating, executing IT-complex projects, cross-functional processes, and dynamism (Bharadwaj, 2000; Teece, 1997), are vital for effective participation in the organizational decision-making processes (Ross et al., 1996). Processes based on the IT network are another facet of IT Resources, being mainly associated with driving automation, information, analytics (Davenport, 1993), and transformation capabilities, are the facets of IT

Resources that are the ones most difficult to imitate or move as they are embedded within complex organizational culture and structures (Melville et al., 2004). These processes also enhance collaboration among organizational functions, employees, customers and suppliers, and hence are likely to result in superior competitive position and performance (Wade and Hulland, 2004). They likewise contribute to integrating IT and business practices (Benjamin and Levinson, 1993; Bharadwaj, 2000), enhancing relationship building (Feeny and Willcocks, 1998), assembling new IT-business partnerships (Ross et al., 1996), and driving IT-business synergy (Bharadwaj, 2000; Jarvenpaa and Leidner, 1998). As noted by Henderson and Venkatraman (1993), IT-enabled capabilities are not so much a specific set of sophisticated technological functionalities but rather an enterprise wide capability which leverages differentiation. IT Resources, and specifically IT architecture, infrastructure, and human resources (Bharadwaj, 2000; Heart et al., 2010) are a reservoir which enables firms to transform IT into IT-enabled communication capabilities as part of the organizational intangible assets. Therefore,

Proposition3a: Strong IT Resources render a stronger Com-Tech capability.

Furthermore, viewed from an RBV perspective, IT resources facilitate innovation in and continuous improvement of processes and products (Duncan, 1995; Venkatraman, 1991); identification and development of key information and knowledge repositories; and implementation of common knowledge databases, transactions systems and standards across the business (Bharadwaj, 2000). Therefore,

Proposition3b: Strong IT-Resources render a stronger Know-Tech capability.

3.5 IT Strategy

IT Strategy is defined as an organization's plan for providing information services (Pearlson and Saunders, 2003) to support the existing business strategy, or to shape a new one (Luftman, 1999). IT Strategy is about choices concerning the position of the organization in the IT marketplace, and hence is comprised of three complementary elements, which model aspects of strategy planning and execution and include strategy differentiation, scope management and performance measurement: (1) 'Distinctive IT Competencies' (Henderson and Venkatraman, 1993), (2) 'IT Governance' (Henderson and Venkatraman, 1993), and (3) 'IT Portfolio' (Weill, 2004). Distinctive IT Competencies mainly focuses on technology and business integration, ensuring on the one hand connectivity among all IT Resources for well-fitted services, and enabling on the other hand alignment between the IT scope and the business scope, thus contributing to the achievements of the organizational business goals, and support the creation of new opportunities (Luftman, 1996; Weill, 2004). IT Governance specifies the management mechanisms, decision rights, and accountability frameworks for shaping IT policies, driving desirable practices in use of IT, and facilitating obtaining the required IT competencies (Weill, 2004). Such mechanisms include a formal decision making process in strategic alliances area, make-versus-buy choices, and the overall structure and roles of the IT organization (Luftman et al., 1993). IT Portfolio is defined as the unique list of IT infrastructure, applications, and services which were carefully selected amongst all IT investment opportunities to successfully support the organization's business goals (Henderson and Venkatraman, 1993) and achieve technology synergy as a source of competitive advantage (Lin et al., 2006). The alignment of IT Strategy and IT Resources is suggested as key to accruing BVIT (Henderson and Venkatraman, 1993). Complementarily, the contingency-based perspective asserts that IT Resources per se may add little value directly, but play a major role in improving firm performance when formulated by IT Strategy and transformed into dynamic-capabilities (Eisenhardt and Martin, 2000). Therefore,

Proposition4a: Stronger IT Strategy renders stronger IT Resources.

IT Strategy also impacts Know-Tech and Com-Tech, as these two IT-enabled capabilities are based on developing, carrying out, and exchanging information among processes and human capital. Itami (1987) refers to IT-enabled capabilities as 'invisible assets', which are built as a result of strategic

planning and resource allocation attempting to seek competitive advantages (Amit and Schoemaker, 1993). Studies grounded in the RBV perspective typically consider IT Strategy in and by itself to be a special resource that can influence organizational performance when properly combined with other strategic resources. For example, when identified with the creation of IT-enabled capabilities (i.e., knowledge dissemination), IT strategy is significantly associated with organizational performance (Bharadwaj, 2000; Santhanam and Hartono, 2003). Thus, it is hypothesized that the effects of IT Strategy and IT Resources on EVIT is fully mediated by Know-Tech and Com-Tech. Therefore

Proposition4b: Stronger IT-Strategy renders stronger Know-TEC capabilities.

Proposition4c: Stronger IT-Strategy renders stronger Com-Tec capabilities.

3.6 Organizational Resources

The Organizational-Resources construct is defined as a comprehensive set of tangible and intangible assets structuring the firm's resource portfolio, arranged and coordinated together to build capabilities and leverage them for stakeholders value (Sirmon et al., 2007). Henderson and Venkatraman (1993) posit that administrative infrastructure, skills, and processes are determinants of Organizational Resources. Thus, the Organizational-Resources construct is conceptualized here as comprised of four elements: 'Physical Capital', 'Organizational Capital', 'Human Capital' and 'Organizational Processes'. Physical capital includes assets such as plants, equipment, geographic locations, and raw materials, which can be leveraged into a value stream through administrative infrastructure, processes, and skills (Barney, 1991; Henderson and Venkatraman, 1993; Melville et al., 2004). Organizational Capital is institutionalized by knowledge and codified experience residing within, and utilized through manuals, databases, patents, structures, systems, and processes (Subramaniam and Youndt, 2005; Youndt et al., 2004). Organizational Capital and Human Capital encompass the training and learning structures in place as part of the organizational infrastructure, as well as the professional experience and competencies of all employees, including managerial education and commitments (Henderson and Venkatraman, 1993; Luftman et al., 1993), including knowledge and skills (Barney, 1991) gained by formal and informal channels of education and work experience. Organizational Processes, defined as organizational resource utilization through "specific ordering of work activities across time and space, with a beginning, an end, and clearly identified inputs and outputs" (Davenport, 1993, p. 5), include advanced management methods to operate and utilize resources and work activities underlying the value-chain processes (Melville et al., 2004), and cost-benefits outcomes.

When analyzing Organizational Resources via the 'IT-Embeddedness' (Kohli and Grover, 2008) lens, their main effects on accruing business value is two-fold. First, they facilitate IT strategy and resources aimed to accumulate, codify, and store knowledge in manuals, databases and patents for collective use (Garud and Nayyar, 1994), as well as to establish robust structures, systems, and processes to convert inputs into steady streams of outcomes (Cooper, 2000). This conceptualization leads to the following hypotheses:

Proposition5a: Stronger Org-Resources render stronger IT-Strategy.

Proposition5b: Stronger Org-Resources render stronger IT-Resources.

Supportive organizational resources are necessary if IT strategy and resources are to enhance organizational knowledge and communication capabilities by facilitating data integration, communication, assimilation of information, and dissemination of knowledge among individuals, groups, and networks (Allen, 1977). Drawing upon Contingency theory, Org-Resources are essential elements in the IT contingent inter-relationship within the organization.

Proposition5c: Stronger Organizational Resources render stronger Know-Tech capabilities.

Proposition 5d: Stronger Organizational Resources render stronger Com-Tech capabilities.

3.7 Organizational Strategy

Organizational Strategy is defined as the pattern of decisions and activities stream (Mintzberg and McHugh, 1985) that characterizes the match an organization achieves with its environment and determines the attainment of its goals (Hofer and Schende, 1978). The emphasis is on an activities pattern that impacts goal achievement in relation to both the internal and external environments (Hakansson and Snehota, 2006; Henderson and Venkatraman, 1993). Consequently, Organizational Strategy composed of: (1) 'Business Scope', (2) 'Business Governance', and (3) 'Distinctive Competencies'. Business Scope or business portfolio (Luftman, 1996; Luftman et al., 1993) includes choices linked with markets, products, services, groups of customers, and locations where an organization competes, as well as the competitive forces affecting the business environment (Porter, 1980). Synergy, integration and prioritization are benefits accrued by Organizational Strategy that can eventually render 'economics of scope' (Bakos and Treacy, 1986; Wade and Hulland, 2004). Business Governance, composed of the internally-oriented elements: organizational structure, business processes, and IT practices, referred also as an internal governance strategy (Bakos and Treacy, 1986), is concerned with the development of efficient information processes to achieve qualitative goals and quantitative objectives between management and stakeholders (directors, strategic partners, regulators and so forth), as well as with maintaining effective organizational structures with high functional alignment (Luftman, 1996; Luftman et al., 1993). Organizational Strategy, however, is incomplete unless supported by 'Distinctive Competencies' (Henderson and Venkatraman, 1993), including cohesive vision and mission, brands, research capabilities, manufacturing and product development, cost and pricing structure, sales and distribution channels (Henderson and Venkatraman, 1993; Luftman, 1996; Luftman et al., 1993), as well as planning, budgeting and control practices which translate into dynamic operational work plans (Eisenhardt and Martin, 2000; Teece, 1997). Organizational Strategy is the driving force behind Organizational Resources, IT Strategy and IT Resources, and a primary facilitator of attaining organizational competencies. For example, Henderson and Venkatraman (1993) portray two alignment views where Organizational Strategy is the initiator which shapes Organizational Resources, IT Strategy and IT Resources. Therefore,

Proposition 6a: Stronger Organizational Strategy renders stronger Organizational Resources.

Proposition 6b: Stronger Organizational Strategy renders stronger IT Strategy.

Proposition 6c: Stronger Organizational Strategy renders stronger IT Resources.

It is important to recognize that a firm's knowledge capacity depend on the ongoing development and exchanges of resources among stakeholders who continually communicate their knowledge and expertise. IT-enabled knowledge, like intellectual assets and unlike physical assets, increase in value with coordinated use (Quinn et al., 1996). This is contingent upon a strong support of top management via adaptive strategies (Teece, 1997). Therefore,

Proposition 6d: Stronger Organizational Strategy renders stronger Know-Tech capability.

Proposition 6e: Stronger Organizational Strategy renders stronger Com-Tech capability.

4 DISCUSSION AND CONCLUSIONS

This study developed a model that portrays the paths by which organizational strategy and resources, together with IT strategy and resources drive economic value of IT (EVIT) via organizational knowledge and communication capacities. The study answers the research questions by 1) showing how the relationships among IT and organizational resources and strategies provide the necessary conditions for IT value creation, and 2) highlighting how the 'embeddedness' nature of IT creates IT-enabled competencies which lead to economic value. Building upon theoretical frameworks that have only seldom been conjointly used before to explain BVIT, the study contributes to the extant body of knowledge by showing the indirect paths from IT to performance as measured by multiple economic indicators, developing three new IT-driven business value constructs: Know-Tech, Com-Tech, and

EVIT, and by proposing their theoretical facets and implying at the empirical scales for their measurement.

This study supports and extends some of the assertions suggested by Kohli and Grover (2008), who maintained that "IT-based value manifests itself in many ways" (p. 26), having developed two such manifestations of BVIT, Know-Tech and Com-Tech, and conceptually showing how IT strategy and resources create knowledge and communication capabilities that lead to the formation of a learning and communicative organization. Know-Tech represents the dynamic process of knowledge accumulation and retention, generated at the heart of the organization as learning practices. Perhaps the most relevant treatment of the learning practice in regards to IT is the concept of absorptive capacity, defined by Cohen and Levinthal (1990) as a firm's ability to recognize the value of new information, thereby collect, codify, assimilate, and apply it commercially to gain economic benefits. Thus when IT promotes learning as absorptive capacity, the result might be increased organizational efficiency and innovation. Com-Tech is the second IT-driven capability that transforms IT into economic value. By capturing and sharing valuable expertise and knowledge throughout an organization, employees can better solve problems, avoid duplication of effort, drive organizational efficiency, and improve innovation in processes and products (Powers, 2004). It is theoretically established that these dynamic capabilities, which are embedded within the organizational complex fabric, can drive competitive edge that can eventually expand into economic values.

The manifestation of these value creation paths substantiates the understanding of IT-Embeddedness suggested by Kohli and Grover (2008). Thus, a plausible sought after path of IT -> Capability Required -> Business Value is demonstrated here, showing how "IT can serve as a magnifier or accelerator of desired business capabilities" (Kohli and Grover, 2008, p. 30) and includes not only IT, but also complementary assets (Davern and Kauffman, 2000), in this case organizational strategy and resources. This is clearly only a first step in a direction that merits further research. An additional research thrust attempted here addresses the question: "what are the indirect and intangible paths to economic value that can be influenced by information and IT capabilities, and how do we foster them?" (Kohli and Grover, 2008, p. 29). It is suggested that knowledge and communication capabilities, fostered by IT, can lead to such value, for example to EVIT. The EVIT concept developed here as a multi-faceted economic manifestation of IT value can pave the road to additional research.

IT and Business alignment has been advocated as key to accruing BVIT, yet quite illusive to identify, define, and empirically test (Henderson and Venkatraman, 1993; Kearns and Lederer, 2000). Previous studies (e.g. Reich and Benbasat, 2000), having looked for factors affecting short-term and long-term alignment, found that knowledge sharing and business-IT relationships contributed to short-term alignment, whereas only shared domain knowledge contributed to long-term alignment. This study takes this conceptualization a step further by identifying alignment through the lens of IT-enabled knowledge and learning as the manifestation and results of business and IT alignment. Likewise, supporting and extending the findings of Mata et al. (1995) that managerial IT skills is the only IT resource that provide sustainable value, this research adds complementary assets (Davern and Kauffman, 2000) and shows, via the Contingency theory lens, how these assets interact to jointly drive organizational performance by creating a knowledgeable, learning organization. This is a particularly warranted perspective in the current knowledge-intensive competition that should be pursued by future research. Especially intriguing is the question: which of the many structures comprising the BVIT contributes most to sustainability.

The study is an additional manifestation of why 'IT Matters' in terms of economic value creation. Whereas direct business benefits of IT are quite illusive, this study draws the paths to accumulate the tacit and idiosyncratic values of IT in knowledge and communication spaces that, unlike physical IT assets, are inimitable and deeply embedded, and therefore can render sustainable competitive edge. Further research should empirically test the model to substantiate the proposed contributions.

References

- Allen, T.J. *Managing the Flow of Technology* The MIT Press, Cambridge, MA, 1977.
- Amit, R., and Schoemaker, P.J.H. "Strategic Assets and Organizational Rent," *Strategic Management Journal* (14:1), 1993, pp 33-46.
- Anderson, J.C., and Gerbing, D.W. "Structural Equation Modeling in Practice: A Review and Recommended Two Step Approach," *Psychological Bulletin* (103:3, 1988, pp 411-423.
- Argyres, N.S. "The Impact of Information Technology on Coordination: Evidence from the B-2" Stealth" Bomber," *Organization Science* (10:2), 1999, pp 162-180.
- Armstrong, C.P., and Sambamurthy, V. "Information Technology Assimilation in Firms: The Influence of Senior Leadership and IT Infrastructures," *Information Systems Research* (10:4), 1999, pp 304-327.
- Bakos, J.Y., and Treacy, M.E. "Information Technology and Corporate Strategy: A Research Perspective," *MIS quarterly* (10:2), 1986, pp 107-119.
- Barney, J.B. "Firm Resources and Sustained Competitive Advantage," *Journal of Management* (17:1), 1991, pp 99-120.
- Barua, A., Kriebel, C.H., and Mukhopadhyay, T. "Information Technologies and Business Value: An Analytic and Empirical Investigation," *Information Systems Research* (6:1), 1995, pp 3-23.
- Bassellier, G., and Benbasat, I. "Business Competence of Information Technology Professionals: Conceptual Development and Influence on IT-Business Partnerships," *MIS quarterly* (28:4), 2004, pp 673-694.
- Benjamin, R.I., and Levinson, E. "A Framework for Managing IT-Enabled Change," *Sloan Management Review* (34:4), 1993, pp 23-33.
- Bharadwaj, A.S. "A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation," *MIS quarterly* (24:1), 2000, pp 169-196.
- Boudreau, M.C., Gefen, D., and Straub, D.W. "Validation in Information Systems Research: A State-of-the-Art Assessment," *MIS quarterly* (25:1), 2001, pp 1-26.
- Christiaanse, E., and Venkatraman, N. "Beyond Sabre: An Empirical Test of Expertise Exploitation in Electronic Channels," *MIS quarterly* (26:1), 2002, pp 15-38.
- Cohen, W.M., and Levinthal, D.A. "Absorptive Capacity: A New Perspective on Learning and Innovation," *Administrative Science Quarterly* (35:1), 1990.
- Cooper, B.L., Watson, H.J., Wixom, B.H., and Goodhue, D.L. "Data Warehousing Supports Corporate Strategy at First American Corporation," *MIS quarterly* (24:4), 2000, pp 547-567.
- Crossan, M.M., Lane, H.W., and White, R.E. "An Organizational Learning Framework: From Intuition to Institution," *Academy of Management Review* (24:3), 1999, pp 522-537.
- Davenport, T.H. *Process Innovation: Reengineering Work through Information Technology* Harvard Business School Press, Cambridge, MA, 1993.
- Davern, M.J., and Kauffman, R.J. "Discovering Potential and Realizing Value from Information Technology Investments," *Journal of Management Information Systems* (16:4), 2000, p 143.
- Dehning, B., and Stratopoulos, T. "Determinants of a Sustainable Competitive Advantage Due to an IT-Enabled Strategy," *Journal of Strategic Information Systems* (12:1), 2003, pp 7-28.
- Dehning, B., Vernon J., Richardson, Stratopoulos, T. "Information Technology Investments and Firm Value," *Information & Management* (42:7, 2005, pp 989-1008.
- DeLone, W.H., and McLean, E.R. "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1), 1992, pp 60-95.
- Diamantopoulos, A., and Winklhofer, H.M. "Index Construction with Formative Indicators: An Alternative to Scale Development," *Journal of Marketing Research* (38:2, 2001.
- Doty, D., Glick, H., and Huber, P. "Fit, Equifinality, and Organizational Effectiveness: A Test of Two Configurational Theories," *Academy of Management Journal* (36:6), 1993, pp 1196-1250.

- Duncan, N. "Capturing Flexibility of Information Technology Infrastructure: A Study of Resource Characteristics and Their Measure," *Journal of Management Information Systems* (12:2, 1995, pp 37-57).
- Easterby-Smith, M., Crossan, M., and Nicolini, D. "Organizational Learning: Debates Past, Present and Future," *Journal of Management Studies* (37:6), 2002, pp 783-796.
- Eisenhardt, K.M., and Martin, J.A. "Dynamic Capabilities: What Are They?," *Strategic Management Journal* (21:10-11), 2000, pp 1105-1121.
- Feeny, D.F., and Willcocks, L.P. "Core IS Capabilities for Exploiting Information Technology," *Sloan Management Review* (39:3, 1998, pp 9-21).
- Figge, F., and Hahn, T. "The Cost of Sustainability Capital and the Creation of Sustainable Value by Companies," *Journal of Industrial Ecology* (9:4), 2005, pp 47-58.
- Garud, R., and Nayyar, P. "Transformative Capacity: Continual Structuring by Inter-Temporal Technology Transfer," *Strategic Management Journal* (15, 1994, pp 365-385).
- Goodhue, D.L., Wixom, B.H., and Watson, H.J. "Realizing Business Benefits through Crm: Hitting the Right Target in the Right Way," *MIS Quarterly Executive* (1:2), 2002, pp 79-94.
- Hakansson, H., and Snehota, I. "No Business Is an Island: The Network Concept of Business Strategy," *Scandinavian Journal of Management* (22:3), 2006, pp 256-270.
- Heart, T., Maoz, H., and Pliskin, N. "From Governance to Adaptability: The Mediating Effect of IT Executives' Managerial Capabilities," *Information Systems Management* (27:1), 2010, pp 42-60.
- Henderson, J.C., and Venkatraman, N. "Strategic Alignment: Leveraging Information Technology for Transforming Organizations," *IBM Systems Journal* (32:1), 1993, pp 4-16.
- Henderson, R.M., and Clark, K.B. "Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms," *Administrative Science Quarterly* (35:1), 1990.
- Hitt, L.M., and Brynjolfsson, E. "Productivity, Business Profitability, and Consumer Surplus: Three Different Measures of Information Technology Value," *MIS quarterly* (20:2), 1996, pp 121-142.
- Hofer, C.W., and Schende, D. *Strategy Formulation, Analytical Concepts* West Publishing, St. Paul, MN, 1978.
- Itami, H. *Mobilizing Invisible Assets* Harvard University Press, Cambridge, MA, 1987.
- Jarvenpaa, S.L., and Leidner, D.E. "Communication and Trust in Global Virtual Teams," *Journal of Computer-Mediated Communication* (3:4), 1998.
- Kearns, G.S., and Lederer, A.L. "The Effect of Strategic Alignment on the Use of IS-Based Resources for Competitive Advantage," *Journal of Strategic Information Systems* (9:4), 2000, pp 265-293.
- Kogut, B., and Zander, U. "Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology," *Organization Science* (3, 1992, pp 383-397).
- Kohli, R., and Grover, V. "Business Value of IT: An Essay on Expanding Research Directions to Keep up with the Times," *Journal of the association for Information Systems* (9:1), 2008, pp 23-39.
- Lei, D., Slocum, J.W., and Pitts, R.A. "Designing Organizations for Competitive Advantage: The Power of Unlearning and Learning," *Organizational Dynamics* (27, 1999, pp 24-38).
- Lin, B.W., Chen, C.J., and Wu, H.L. "Patent Portfolio Diversity, Technology Strategy, and Firm Value," *IEEE Transactions on Engineering Management* (53:1), 2006, pp 17-26.
- Luftman, J., Brier, T. "Achieving and Sustaining Business-IT Alignment," *California Management Review* (1, 1999, pp 109-122).
- Luftman, J.N. *Competing in the Information Age: Strategic Alignment in Practice* Oxford University Press, USA, 1996.
- Luftman, J.N., Lewis, P.R., and Oldach, S.H. "Transforming the Enterprise: The Alignment of Business and Information Technology Strategies," *IBM Systems Journal* (32:1, 1993).
- Malhotra, N., Kim, S., S., and Patil, A. "Common Method Variance in IS Research: A Comparison of Alternative Approaches and a Reanalysis of Past Research," *Management Science* (52:12), 2006, pp 1865-1883.
- Maoz, H. "Modeling Alignment of Organizational and IT Strategies and Resources for Sustaining IT Business Value," Ph.D. Dissertation, Industrial Engineering and Management, Ben-Gurion University of the Negev, Beer-Sheva, 2009.

- March, J.G. "Exploration and Exploitation in Organizational Learning," *Organization Science* (2:1), 1991, pp 71-87.
- Mata, F.J., Fuerst, W.L., and Barney, J.B. "Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis," *MIS quarterly* (19:4), 1995, pp 487-505.
- Matusik, S.F., and Hill, C.W.L. "The Utilization of Contingent Work, Knowledge Creation, and Competitive Advantage," *Academy of Management Review* (23:4), 1998, pp 680-697.
- Melville, N., Kraemer, K., and Gurbaxani, V. "Review: Information Technology and Organizational Performance: An Integrative Model of IT Business Value," *MIS quarterly* (28:2), 2004, pp 283-322.
- Mintzberg, H., and McHugh, A. "Strategic Formulation in an Adhocracy," *Administrative Science Quarterly* (30), 1985, pp 160-197.
- Nonaka, I. "A Dynamic Theory of Organizational Knowledge Creation," *Organization Science* (5:1), 1994, pp 14-37.
- Pearlson, K.E., and Saunders, C.S. *Managing and Using Information Systems: A Strategic Approach* (2nd ed.) John Wiley & Sons, New York, NY, 2003.
- Penrose, E.T. *The Theory of the Growth of the Firm* Wiley, New York, 1959.
- Petter, S., Straub, D.W., and Rai, A. "Specifying Formative Constructs in Information Systems Research," *MIS Quarterly* (31:4), 2007, pp 623-656.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., and Podsakoff, N.P. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88(5)), 2003, pp 879-903.
- Porter, M.E. *Competitive Strategy: Techniques for Analyzing Industries and Competitors* Free Press, New York, NY, 1980.
- Powers, V. "Virtual Communities at Caterpillar Foster Knowledge Sharing," *T AND D* (58, 2004, pp 40-40.
- Pralahad, C.K., and Hamel, G. "The Core Competence of the Corporation," *Harvard Business Review* (68:3), 1990, pp 79-91.
- Quinn, J.B., Anderson, P., and Finkelstein, S. "Leveraging Intellect," *The Academy of Management Executive* (1993-2005) (10:3), 1996, pp 7-27.
- Radhakrishnan, A., Zu, X., and Grover, V. "A Process-Oriented Perspective on Differential Business Value Creation by Information Technology: An Empirical Investigation," *Omega* (36:6), 2008, pp 1105-1125.
- Real, J.C., Leal, A., and Roldan, J.L. "Information Technology as a Determinant of Organizational Learning and Technological Distinctive Competencies," *Industrial Marketing Management* (35:4), 2006, pp 505-521.
- Reich, B.H., and Benbasat, I. "Factors That Influence the Social Dimension of Alignment between Business and Information Technology Objectives," *MIS quarterly* (24:1), 2000, pp 81-113
- Ringle, C.M., Wende, S., and Will, A. "Smartpls 2.0 (M3) Beta," in: *Universitat Hamburg, Hamburg, 2005.*
- Rivard, S., Raymond, L., and Verreault, D. "Resource-Based View and Competitive Strategy: An Integrated Model of the Contribution of Information Technology to Firm Performance," *The Journal of Strategic Information Systems* (15:1), 2004, pp 29-50.
- Rockart, J.F., Earl, M. J., Ross, J. W. "The New IT Organization: Eight Imperatives," *Sloan Management Review* (38:1), 1996.
- Ross, J.W., Beath, C.M., and Goodhue, D.L. "Develop Long-Term Competitiveness through IT Assets," *Sloan Management Review* (38:1), 1996, pp 31-42.
- Santhanam, R., and Hartono, E. "Issues in Linking Information Technology Capability to Firm Performance," *MIS quarterly*, 2003, pp 125-153.
- Seddon, P. "A Respecification and Extension of the DeLone and Mclean Model of IS Success," *Information Systems Research* (8:3), 1977, pp 240-253.
- Sirmon, D.G., Hitt, M.A., and Ireland, R.D. "Managing Firm Resources in Dynamic Environments to Create Value: Looking inside the Black Box," *Academy of Management Review* (32:1), 2007.
- Stewart, G.B. *The Quest for Value: A Guide for Senior Managers* HarperBusiness, New-York, 1999.

- Straub, D., Boudreau, M.C., and Gefen, D. "Validation Guidelines for IS Positivist Research," *Communication of the Association for Information Systems* (13, 2004, pp 380-427.
- Subramaniam, M., and Youndt, M.A. "The Influence of Intellectual Capital on the Types of Innovative Capabilities," *Academy of Management Journal* (48:3), 2005, p 450.
- Teece, D.J., Pisano, G., and Shuen, A. "Dynamic Capabilities and Strategic Management," *Strategic Management Journal* (18:7, 1997, pp 509-533.
- Venkatraman, N. "IT Induced Business Reconfiguration, in the Corporation of the 1990s," In: Morton, M., (Ed.), Oxford University Press, New York, NY), 1991, pp 122–158.
- Wade, M., and Hulland, J. "Review: The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research," *MIS quarterly* (28:1), 2004, pp 107-142.
- Weill, P. "The Relationship between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector," *Information Systems Research* (3:4), 1992, pp 307-331.
- Weill, P. "Managing the IT Portfolio," Massachusetts Institute of Technology (MIT) - Sloan School of Management, Center of Information Systems Research (CISR), 2004.
- Weill, P., and Olson, M.H. "An Assessment of the Contingency Theory of Management Information Systems," *Journal of Management Information Systems* (6:1, 1989, pp 59-85.
- Youndt, M.A., Subramaniam, M., and Snell, S.A. "Intellectual Capital Profiles: An Examination of Investments and Returns," *Journal of Management Studies* (41:2), 2004, pp 335-361.