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INFORMATION TECHNOLOGY USE AS A LEARNING MECHANISM: THE IMPACT OF IT USE ON KNOWLEDGE TRANSFER EFFECTIVENESS, ABSORPTIVE CAPACITY, AND FRANCHISEE PERFORMANCE[1]

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This study aims to contribute to the literature through the theoretical development and empirical investigation of the role of information technology use in organizational learning. We develop a theoretical framework that unpacks organizational learning into mechanisms and outcomes. The outcomes of organizational learning are distinguished at two levels: first-order and second-order. Based on the framework, we propose a research model set in the franchising context. We conceptualize franchisee use of IT provided by the franchisor as an important learning mechanism that impacts knowledge transfer effectiveness (first-order outcome) and absorptive capacity (second-order outcome). Further, the influence of IT use on financial performance is mediated through absorptive capacity. The model was tested on a sample of 783 independently owned real-estate franchisees using a comprehensive dataset comprised of primary and secondary data. The results indicate that IT use is an important learning mechanism for franchisees by impacting knowledge transfer effectiveness and absorptive capacity. In turn, absorptive capacity mediates the relationship between IT use and financial performance. The empirical support for the research model serves to affirm the underlying learning mechanisms–outcomes framework. The results are stable across the choice of statistical method and the operationalization of financial performance. Theoretical contributions, implications for practice, and limitations of the study are discussed.

Keywords: IT use, organizational learning, knowledge transfer effectiveness, absorptive capacity, IT value, franchising

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Introduction

This study focuses on investigating the role of information technology (IT) in organizational learning. Two significant developments in research and practice over the past two decades drive this investigation. First, IT has become more powerful, relatively cheaper, and has spread throughout organizations at a rapid rate. Research has found that organizations are investing ever more resources into IT-based systems to manage their knowledge resources, with the premise that this will lead to strategic competitive advantage, thus impacting firm performance (Alavi and Leidner 2001; Pavlou and El Sawy 2006; Sambamurthy et al. 2003; Sambamurthy and Subramani 2005). Second, firms are increasingly facing rapidly changing business environments. To thrive in such uncertain environments, firms are under constant pressure to leverage their learning capabilities. Organizational management research has, therefore, expanded its focus from explaining variance in firm performance as a factor of traditional resources (such as land, labor, and capital) to include the firm's capabilities in managing its knowledge and related processes, that is, organizational learning (Argote and Miron-Spektor 2011; Grant 1996; Spender 1996; Zollo and Winter 2002). Given the increasing stature of IT within organizations and the salience of organizational learning, understanding the specific role that IT plays in organizational learning is particularly important (Kane and Alavi 2007).

Although its importance is acknowledged (Argote et al. 2003; Sambamurthy and Subramani 2005), a holistic and systematic understanding of the role of IT in organizational learning still remains elusive (Bharadwaj et al. 2013). Under the broad domain of knowledge management systems (KMS) research, IS research has made progress in explaining the impact of IT-based systems on the stocks and flows of knowledge within organizations (Alavi and Leidner 2001; Markus, 2001). To a lesser extent, IS research has also examined the impact of information systems as an enabler of dynamic capabilities (Malhotra et al. 2005; Pavlou and El Sawy 2006). However, literature that bridges the gap between the impact of IT on knowledge management outcomes and on dynamic capabilities has been rare.[2] Moreover, the few studies that attempt to integrate knowledge management and dynamic capability outcomes do so in an *ad hoc* fashion without providing a conceptual basis of their convergence (Easterby-Smith and Prieto 2008). Further, the conceptual link between the IS outcomes of interest (i.e., knowledge management outcomes and dynamic capabilities), and how they relate to organizational learning, has eluded prior literature (Crossan et al. 2011; Easterby-Smith and Prieto 2008; Roberts et al. 2012; Vera et al. 2011). The absence of this conceptual link can perhaps be attributed to the lack of theoretical convergence within the organizational learning literature itself[3] (Argote and Miron-Spektor 2011; Bapuji and Crossan 2004; Easterby-Smith and Lyles 2011; Robey et al. 2000).[4] Conceptual convergence between these related domains can not only help us understand their complementarities, but also has the potential to substantially increase our understanding of the import role of IT in organizations. Thus, it is clear that to make progress in understanding the true importance of IT in organizational learning, the conceptual gaps between organizational learning, knowledge management outcomes, and dynamic capabilities have to be bridged.

This study aims to further our understanding through the theoretical development and empirical investigation of the role of IT on organizational learning. First, we address the need for conceptual clarity of the role of IT in organizational learning by proposing our learning mechanisms–outcomes framework. Building on prior research, we separate the mechanisms from the outcomes of organizational learning. Further, the outcomes of organizational learning are distinguished at two levels, first- and second-order outcomes. Next, we apply the learning mechanisms–outcomes framework to the franchising context to derive our research model and hypotheses.[5] Franchisee use of IT provided by the franchisor is conceptualized as a learning mechanism, which impacts knowledge transfer effectiveness (first-order outcome) and absorptive capacity (second-order outcome), and, subsequently, franchisee financial performance. We empirically test our hypothesized research model on a sample

[2]For an exception, see Pavlou and El Sawy (2006) who examine the evolution of dynamic capabilities in new product development teams.

[3]This lack of convergence has been attributed to various reasons including divergent ontological bases (Easterby-Smith and Lyles 2011; Robey et al. 2000), application of various disciplinary approaches such as behavioral versus cognitive perspectives (Friedman et al. 2005), the varying applications of the organizational learning phenomenon to different domains (Crossan et al. 1999), conflating various levels of analysis (individual, group, and organizational), organizational structure and culture, learning mechanisms with their outcomes (Dodgson 1993; Huber 1991; Robey et al. 2000), and even varying definitions of organizational learning (Argote and Miron-Spektor 2011).

[4]It is beyond the scope of this paper to summarize the literature on organizational learning. Readers are encouraged to refer to comprehensive reviews on the topic such as Argote and Miron-Spektor (2011), Bapuji and Crossan (2004), Crossan et al. (1999), and Easterby-Smith and Lyles (2011).

[5]The *franchise network* is comprised of a *franchisor* and several *franchisees*. The franchisor owns the business (trademarks, products, etc.) and, for a fee, provides the rights to the franchisee to operate the business in a specific geographical location.

of 783 independently owned real-estate franchisees. We follow several prior studies that have used franchisees as the unit of analysis to examine organizational learning phenomena (Argote and Ingram 2000; Bradach 1997; Jensen and Szulanski 2007; Kostova and Roth 2002; Winter and Szulanski 2001; Winter et al. 2012). A typical franchise network is a collaborative alliance between the franchise headquarters and several independently owned franchisees that operate in various locations. Given that franchising seeks to link independent entities (Bercovitz 1999), knowledge management processes that enable franchisee learning are centrally important for the success of the franchisee (Baum and Ingram 1998; Darr et al. 1995). In addition, information technologies have been known to play an important role in providing the franchisee with ready access to information and knowledge (Banker et al. 1990; Paswan and Wittmann 2009). Therefore, understanding franchisee learning is a relevant setting to investigate the role of IT in organizational learning.

This study contributes to the literature by providing a comprehensive theoretical development as well as empirical evidence to further our understanding of organizational learning and the important role that IT plays in organizational learning. There are three main contributions. First, based on prior research on organizational learning, we propose our learning mechanisms–outcomes framework. The framework provides a conceptual lens to integrate the rich domains of organizational learning, knowledge management, and dynamic capabilities. In doing so, the framework presents IS literature with the theoretical basis for integrating literature examining the impact of IT on knowledge outcomes and dynamic capabilities. Second, the study heeds the call for studies that can provide a more detailed and refined understanding of the role of IT in organizational learning (Robey et al. 2000) and, thus, takes an important step in establishing the significant role of IT within organizations. Third, the results from testing the model on a large sample of franchisees provide initial evidence for the role of IT as a key determinant of learning outcomes and franchisee financial performance. The empirical support for the research model also serves to affirm the underlying learning mechanisms–outcomes framework.

We organized this paper in four sections. In the theoretical framework section, we lay out the arguments supporting the learning mechanisms–outcomes framework. In the research model and hypotheses section, we apply the learning mechanisms–outcomes framework to the franchising context to derive our research model and support our hypotheses. Next, we describe the contextual setting, data collection, and empirical analysis in the research method section. Finally, we conclude by discussing our findings and their implications.

Theoretical Framework

Organizational learning is concerned with the processes through which organizations acquire knowledge, translate it into action, and the outcomes of these actions. The underlying premise is that organizations are cognitive entities capable of experimenting, observing, and modifying their actions in order to improve performance (Fiol and Lyles 1985; Robey et al. 2000). Prior organizational learning literature has progressed along two paths, with divergent ontological bases underlying each paradigm (Crossan et al. 2011; Easterby-Smith 1997). On one hand, literature interested in explaining how the *process* of organizational learning takes place typically reduce the organizational learning process into yet more subprocesses.[6] While this approach is intuitively appealing in its power to explain how organizational learning occurs, it does not provide adequate guidance on measurement, which leads to operational challenges (Robey et al. 2000). On the other hand, *content* theories (such as the knowledge-based view, dynamic capabilities) are more intent on providing conceptual explanations of the outcomes of learning (Vera et al. 2011). While this approach makes empirical examinations much more tractable, they are burdened with the lack of explanatory power and richness of the prior approach. The independent development of process and content-oriented literatures makes it unclear as to how organizational learning, knowledge management outcomes (such as knowledge transfer, knowledge sharing, etc.), and dynamic capabilities (such as absorptive capacity) are related. We could only find two conceptual studies that aimed to integrate and synthesize them to further our understanding. Easterby-Smith and Prieto (2008) integrate knowledge management and dynamic capabilities, and propose that learning itself is a dynamic capability that drives both within organizations. Vera et al. (2011) propose a process framework that argues that organizational learning is the change in capabilities. Yet, neither of these efforts enables existing literature to establish "a stronger association between actions that are construed as learning and the outcomes of learning" (Robey et al. 2000, p. 133)

Two developments have the potential for providing conceptual synthesis between process and content paradigms, as well as establishing the importance of organizational actions that drive organizational learning. The first development stems from the work of Popper and his associates (Friedman et al. 2005; Popper and Lipshitz 1998, 2000) who introduce the concept of organizational learning *mechanisms*. They define organizational learning mechanisms as

[6]These studies are typically characterized by the use of verbs ("ing" form) to describe organizational learning (Crossan et al. 2011).

> structural and procedural arrangements that allow organizations to systematically collect, analyze, store, disseminate and use information relevant to the performance of the organization and its members (Popper and Lipshitz 1998, p. 170).

Organizational learning mechanisms are observable structures, procedures, or routines that enable organizational members to interact for the purpose of learning (Friedman et al. 2005). Several learning mechanisms have been discussed in organizational literature. For example, post-project reviews (Schindler and Eppler 2003; Von Zedtwitz 2002), job rotation (O'Leary et al. 2011; Ortega 2001), research and development departments (Dodgson 1993; Mowery and Rosenberg 1991), executive succession (Virany et al. 1992), and strategic alliances (Hamel 1991; Kale et al. 2000) are all conceptualized as learning mechanisms that enable organizational learning. Some learning mechanisms are formal structures, such as research and development departments and strategic alliances, which are readily observed. Other learning mechanisms are procedural, such as post-project reviews, and pertain to routines initiated by the firm to enable learning. A common theme among all learning mechanisms is that they facilitate learning by organizational members by enabling the storage and dissemination of knowledge.

The second development relates to distinguishing between the outcomes of organizational learning at two levels, that is, between the first-order and second-order outcomes of learning. As summarized in Table 1, prior research has implicitly and explicitly distinguished between the outcomes of organizational learning at two levels. The specific labels used to describe first- and second-order outcomes of learning in these prior studies are different. For example, Danneels (2008) uses the terms *first- and second-order competencies*; Winter (2003) labels them *as zero-level and first-order capabilities*; Zahra et al. (2006) term them *substantive and dynamic capabilities*. Most recently, Pavlou and El Sawy (2006) use the terms *functional competencies* and *dynamic capabilities*. This avoids any confusion with the term *capability* by using it to only refer to the higher order outcomes of learning. The distinction between the lower and higher order outcomes also evokes the seminal work of Argyris and Schön (1974, 1978) who explain changes in the firm's knowledge resource base as single-loop learning and higher order changes as a product of double loop learning (Ambrosini et al. 2009). While the labels differ, these studies are fairly consistent in separating the two levels of outcomes of organizational learning mechanisms. Our conceptualization is similar to these prior studies that differentiate between the two levels of outcomes (Danneels 2008; Pavlou and El Sawy 2006; Winter 2003; Zahra et al. 2006).

First-order outcomes of learning are analogous to functional competencies and are concerned with improvements in the effectiveness and efficiency of performing operational day-to-day activities that enable the firm to earn a living in the present (Pavlou and El Sawy 2006). First-order outcomes pertain to potential improvements in operational activities of the firm (Collis 1994), and have an immediate and clear use (Danneels 2008). Dynamic capabilities constitute the second-order outcomes of learning (Ambrosini et al. 2009; Collis 1994; Zollo and Winter 2002), and pertain to the insights gained about how to function effectively and efficiently in various environments brought on by changing markets (Levinthal and March 1993). Helfat et al. (2007, p. 1) define dynamic capabilities as "the capacity of an organization to purposefully create, extend or modify its resource base."[7] As the second-order outcome of learning, dynamic capabilities offer deeper strategic insights about resources and environments that enable adaptation to change (Collis 1994; Danneels 2008). Winter (2003, p. 992) provides a heuristic guide to distinguish between the two levels:

> Consider a hypothetical firm "in equilibrium," an organization that keeps earning its living by producing and selling the same product, on the same scale and to the same customer population over time. The capabilities exercised in that stationary process are the zero-level capabilities, the "how we earn a living now" capabilities. Without them, the firm could not collect the revenue from its customers that allows it to buy more inputs and do the whole thing over again. By contrast, capabilities that would change the product, the production process, the scale, or the customers (markets) served are not at the zero level.

Distinguishing between first- and second-order outcomes of organizational learning is important for theoretical and practical reasons. A lack of distinction between the two levels may lead to incomplete understanding of organizational learning, thereby detracting from empirical research (Visser 2007). Further, while both are important, first-order outcomes are much easier to accomplish, and the gains far less sustainable, than second-order outcomes (Arthur and Aiman-Smith 2001). This distinction is a significant one to make because the outcomes may be differentially important in predicting performance under varying contexts (Virany et al. 1992). In less-dynamic contexts, first-order outcomes improve existing oper-

[7]While the definition of dynamic capabilities has undergone several iterations, this definition links dynamic capabilities to organizational learning directly, because of its cognizance of intangible assets (such as knowledge) to be included in the broad meaning of the term *resource* (Helfat et al. 2007, p. 4).

Table 1. Exemplars of Prior Research that Distinguish Between the Outcomes of Organizational Learning

Article	Arguments
Fiol and Lyles (1985)	It is possible to identify two levels of learning, as lower-level and higher-level. Lower level learning refers to rudimentary associations of behavior and outcomes pertaining to organizational routines. Higher-level learning changes overall rules and norms rather than specific routines.
Levinthal and March (1993)	Learning occurs at several interrelated levels at the same time. An organization learns which strategy to follow, and how to operate in various alternative strategies.
Danneels (2008)	Second-order competences sit at a higher level than first-order competences. A first-order competence is a skill at performing a particular task, whereas, a second-order competence is a skill at learning new tasks.
Winter (2003)	Zero-level capabilities, also termed *ordinary or operational capabilities*, are analogous to resources, and permit the firm to earn a living in the present. First-level capabilities, analogous to dynamic capabilities, modify and change zero-level capabilities.
Ambrosini et al. (2009)	Dynamic capabilities are an extension of RBV thinking. Dynamic capabilities are at a higher level than resources, and are defined as the intentional efforts to change the firm's resource base.
Collis (1994)	There is an infinite regression of capabilities on various levels with each successive capability as the capability to renew lower capabilities. The first are akin to resources (i.e., those that reflect an ability to perform the basic functional activities of the firm). The second category concerns dynamic improvements to the activities of the firm.
Zahra et al. (2006)	Dynamic capabilities can be distinguished from substantive capabilities. Substantive capabilities refer to the firm's ability to solve a problem, whereas dynamic capabilities are higher-order abilities to manipulate substantive capabilities.
Zollo and Winter (2002)	Organizational learning processes are geared to meet the demands at two levels. The first is termed operational routines, and corresponds to the passive experiential process of learning responsible for the operating activities of the firm. The second, which constitute dynamic capabilities, refers to the cognitive processes that constitute the firm's systematic methods for modifying operational routines.
Pavlou and El Sawy (2006)	Functional competencies help the firm to undertake its day-to-day activities, whereas dynamic capabilities allow firms to shape their functional competencies when the opportunity or need arises.

ational processes and procedures, and contribute to increasing efficiency, thus impacting performance. In turbulent and learning-intensive contexts, core assumptions and premises underlying the operational procedures are changed due to the second-order learning outcomes, thus enabling the firm to change.

Building on the aforementioned developments, we unpack organizational learning into organizational learning *mechanisms* and first- and second-order organizational learning *outcomes* as shown in Figure 1. Thus, we conceptualize *organizational learning as the relationship between the use of learning mechanisms and their potential impact on the first- and second-order outcomes within the organization*. There are several benefits of this conceptualization. First, it establishes links between abstract concepts and organizational actions (Friedman et al. 2005; Robey et al. 2000), thus avoiding the reliance on metaphorical and anthropomorphic constructs (Popper and Lipshitz 1998). Second, it makes research on organizational learning more tractable by opening it up to empirical investigations where organizational learning is construed to have taken place when learning mechanisms impact learning outcomes (Friedman et al. 2005). Third, the conceptualization enables the investigation of differential impacts of various learning outcomes on performance.

Research Model and Hypotheses

In this section, we apply the learning mechanisms–outcomes framework to inform the development of our research model and hypotheses specific to the franchising context. We begin by introducing the variables that constitute learning mechanisms and first- and second-order outcomes.

We conceptualize IT use as a learning mechanism as defined by Popper and Lipshitz (1998). Prior IS research supports both aspects of this definition of learning mechanisms as applied to IT use: that IT use is a *structural arrangement* and

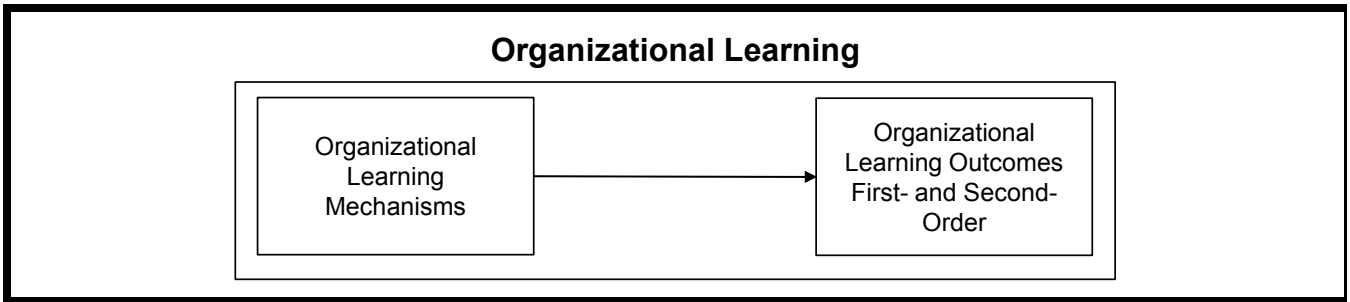

Figure 1. Learning Mechanisms and Outcomes Framework

that IT use *enables the collection, storage and dissemination of organizational knowledge*. Structurational models of technology conceptualize technology artifacts as embodying potential structures, which are then appropriated during their use (DeSanctis and Poole 1994; Orlikowski 1992, 2000). This perspective focuses attention on the structures emergent in practice, rather than the technology (Orlikowski 2000). The technology artifact is developed through a social-political process which embodies rules and resources for appropriation (Orlikowski 2000). However, the artifacts alone do not represent structure. Instead they only have the *potential* to serve as structuring elements. They should be accompanied by human action (i.e., use) in order to be considered structures. As Orlikowski (2000, p. 406) explains,

> Structure is here understood as the set of rules and resources instantiated in recurrent social practice. Elements of technology, once they have been built into a technology, are external to human action. As inscribed properties of a technology, they constitute neither rules nor resources, and thus cannot be seen to be structures. It is only when such technological elements are routinely mobilized in use that we can say that they "structure" human action, and in this way they become implicated as rules and resources in the constitution of a particular recurrent social practice.

Prior IS and organizational learning research has supported the notion that IT use enables the storage, collection, and dissemination of information and knowledge in organizations. For example, Alavi and Leidner (2001) argue that IT use can enable, support and even enhance four knowledge processes of creation, storage, transfer. and application within organizations. Similarly, Robey et al. (2000) make the case that IT use supports organizational learning through the capture, representation, storage, retrieval, and communication of information and knowledge. Further, it has been proposed that IT use impacts organizational learning by enabling the transfer of tacit and explicit knowledge (Kane and Alavi 2007). These arguments are also supported by organizational learning researchers. For example, Argote and Miron-Spektor (2011) posit that information systems serve as knowledge repositories that serve to remember, retrieve, and distribute knowledge and information, thus enabling organizational learning. Further, Tippins and Sohi (2003) make three arguments to support the notion that IT use enables organizational learning. First, IT use accelerates the speed at which information is acquired and disseminated throughout the rm. Second, IT use enables shared individual interpretations of information enabling consensus development. Third, IT use serves as a mechanism for the storage and retrieval of knowledge within the organization. Thus, given the broad ranging support for IT use as a structural arrangement that enables the collection, storage and dissemination of knowledge, we conceptualize IT use as an organizational learning mechanism.

In this study, we focus on franchisee use of IT provided by the franchisor (i.e., *internal IT use*) as the focal learning mechanism for franchisees. Two reasons drive this choice. First, franchising is an example of network organization that exists primarily to enable effective knowledge transfer (Baum and Ingram 1998; Gupta and Govindarajan 2000; Inkpen and Tsang 2005). The franchising literature further suggests that the franchisor is the most important source of knowledge for the franchisees (Bradach 1998; Darr et al. 1995). The franchisor assumes the role of the producer and intermediary of knowledge, focusing on eliciting, documenting, indexing, and packaging knowledge so that it can be disseminated to, and consumed by, the franchisee (Markus 2001). Second, franchisors often rely on IT-based systems to transfer knowledge to franchisees (Banker et al. 1990; Paswan and Wittmann 2009; Seideman 1998, 1999).[8] Franchisors are motivated to build these IT systems and provide them to the franchisee, because they can potentially provide a cost-effective means of

[8]Indeed, Paswan and Wittmann (2009) discuss how IT systems enable knowledge transfers between franchisees directly, and also from the franchisees to the franchise headquarters. These phenomena, while interesting, are beyond the scope of this study.

enabling its knowledge production and intermediary roles (Markus 2001). Franchisees make specific decisions about the extent to which they use such franchisor provided IT (Winter et al. 2012). The extent to which a focal franchisee uses such IT resources, however, could potentially impact its learning from the franchisor.[9]

In this study, *knowledge transfer effectiveness* is the first-order outcome of learning. The effective transfer of knowledge has been recognized as an important area of study in organizational learning research (Gupta and Govindarajan 2000; Kogut and Zander 1992; Lane et al. 2001; Szulanski and Jensen 2006; van Wijk et al. 2008). Knowledge transfer effectiveness subsumes the interplay of two entities (individuals, groups or teams, organizations, etc.), the entity *from* which the knowledge is being transferred, and the entity *to* which the knowledge is being transferred, that is, the source and the recipient (Alavi and Leidner 2001). In this study, the source is the franchise headquarters, and the recipient is the franchisee. In line with prior research, we define knowledge transfer effectiveness as the extent to which the franchisee acquires useful knowledge for its operational activities (Ambos and Ambos 2009; Foss and Pederson 2002; Levin and Cross 2004; Minbaeva et al. 2003; Zollo and Winter 2002). As such, the effectiveness of knowledge transfer is an *ex post* evaluation of the perceived usefulness of the knowledge to the recipient's (i.e., the franchisee's) operations (Ambos and Ambos 2009; Becerra-Fernandez and Sabherwal 2001; Gold et al. 2001). In doing so, we follow prior studies that treat knowledge as an information good whose value is in its use, rather than a stock/flow approach that treats knowledge as an economic good (Haas and Hansen 2005). This perspective emphasizes that the value of knowledge should be assessed by evaluating the benefit of the received knowledge to the recipient (Ambos and Ambos 2009; Becerra-Fernandez and Sabherwal 2001; Levin and Cross 2004).

Knowledge transfer effectiveness is particularly relevant for franchisees (Darr et al. 1995; Szulanski and Jensen 2006). Because franchising links independent entities in a hybrid form of governance, somewhere between markets and hierarchies (Bercovitz 1999), a key to franchisee performance, therefore, is the dissemination of useful knowledge from the franchise headquarters to franchisees (Baum and Ingram 1998; Darr et al. 1995). The franchise headquarters is the key provider of useful knowledge, thereby increasing the knowledge resource base of each franchisee. Indeed, franchisees are motivated to join franchise networks because of this premise (Darr et al. 1995; Szulanski and Jensen 2006). Given its importance within the franchising context, knowledge transfer effectiveness is the first-order outcome of interest in this study.

We focus on *absorptive capacity* as the second-order outcome of learning. Absorptive capacity is a dynamic capability (Roberts et al. 2012; Zahra and George 2002). It is defined as a firm's capability to "recognize the value of new knowledge, assimilate it, and apply it to commercial ends" (Cohen and Levinthal 1990, p. 128).[10] Absorptive capacity has emerged as an important concept in explaining the processes through which organizations identify and use knowledge to impact performance (Cohen and Levinthal 1990; Lane et al. 2006; Roberts et al. 2012; Volberda et al. 2010). In their recent review of absorptive capacity in the IS literature, Roberts et al. (2012) clarify the nature of absorptive capacity as an organizational dynamic capability and not an asset, thus differentiating it from the firm's extant knowledge resource base.[11] Much like independent firms, a franchisee's absorptive capacity is crucial in recognizing threats and opportunities and reacting to them (Bradach 1998; Cohen and Levinthal 1990; Kostova 1999; Yu and Zaheer 2010). To a great extent, franchisees rely on knowledge coming from the franchise headquarters. Without the capability to recognize and apply knowledge that they receive from the headquarters, franchisees may be unable to leverage this knowledge toward commercial ends. Franchisee absorptive capacity is, therefore, of fundamental importance. Thus, absorptive capacity is conceptualized as the second-order outcome (i.e., a dynamic capability) of interest in this study.

Our research model is shown in Figure 2. We conceptualize internal IT use as a franchisee learning mechanism. Knowledge transfer effectiveness is the first-order outcome, whereas absorptive capacity of the franchisee is the second-order dynamic capability of interest. Franchisee financial growth is the endogenous variable. In the following subsections, we present the case for each of the hypotheses presented in the research model.

Internal IT Use and Knowledge Transfer Effectiveness

As mentioned above, IS research has argued that IT use has an important role in enabling knowledge transfer (Alavi and

[9]As we explain later, we control for the franchisee use of IT not sourced from the franchisor, what we term *external IT use*.

[10]While other conceptualizations of absorptive capacity exist (Lane et al. 2006; Lane et al. 2001; Volberda et al. 2010; Zahra and George 2002), we rely on this definition because of its roots in organizational learning.

[11]The IS literature has conceptualized absorptive capacity in three distinct ways: as an asset, an ordinary capability, and a dynamic capability. For a comprehensive review of absorptive capacity in the IS literature, see Roberts et al. (2012).

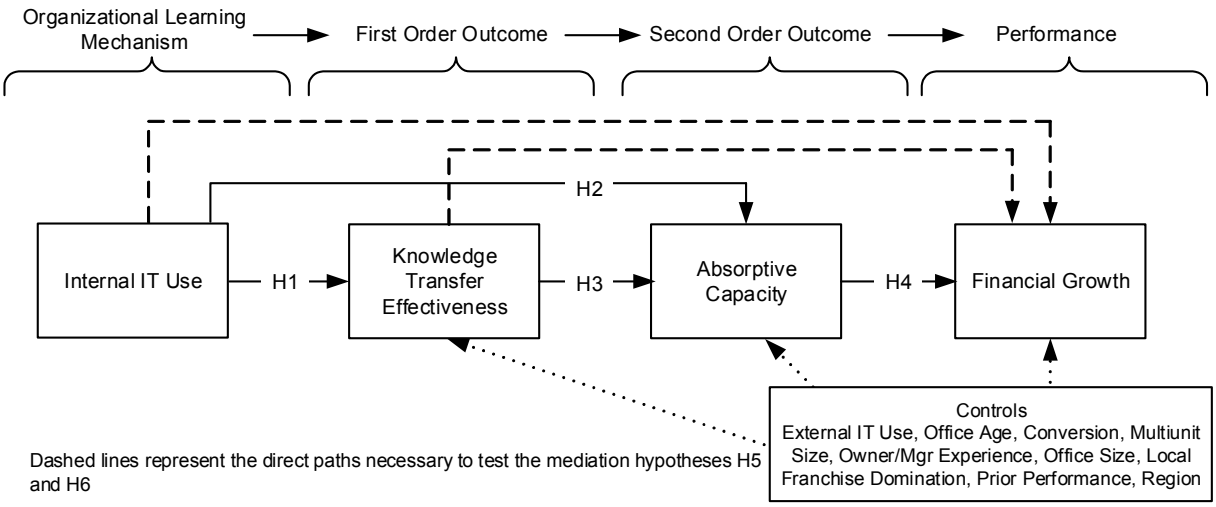

Figure 2. Research Model

Leidner 2001; Sambamurthy and Subramani 2005). Prior literature suggests that IT systems enable the capture, storage, and transfer of knowledge (Alavi and Leidner 2001; Markus 2001). To date, however, most empirical examinations of this relationship have tended to focus on the individual level of analysis. We posit that transfer of knowledge through IT use at the organizational level of analysis is an important span for IS research to bridge, complementing our understanding of the transfer of knowledge between individuals within a firm. Yet, we found only three studies that empirically examine this relationship at the organizational level of analysis. In the first of these studies, Malhotra et al. (2007) surveyed supply chain partners to understand how standard electronic business interfaces positively influence information exchange between them. More recently, Merminod and Rowe (2012) and Westergren and Holmström (2012), employ qualitative methods to begin characterizing the processes that underlie this relationship, but do not investigate variance. Therefore, further research is needed to better understand this relationship.

Within the franchising context, we argue that greater internal IT use by the franchisee leads to greater knowledge transfer effectiveness. The franchising literature has emphasized the role of various transfer mechanisms through which knowledge transfer takes place. Darr et al. (1995) theorize that regular communication, personal acquaintance, and meetings all serve as mechanisms for knowledge transfer. These are, in turn, facilitated by technology (Paswan and Wittmann 2009). Technology-based systems are constructed to enable the transfer of knowledge of effective strategies and tactics regarding the business to the franchisee. Franchisees are motivated to use these systems for ready access to this knowledge (Dickey and Ives 2000). In using these systems, franchisees draw upon the franchise headquarters' knowledge to inform them about how to best constitute their own work practices. For example, Nonaka et al. (1998) describe a case study of Seven Eleven Japan, which offers a point-of-sale system to franchisees. These point-of-sale systems enable profitability listings to be generated by the franchise headquarters, which identify and replace poorly performing products at the franchisee location, thereby enabling the franchisee to be more efficient and effective in serving its market. Similarly, Bradach (1998) describes the use of information systems within KFC, Pizza Hut, Jack in the Box, and Hardee's that recorded each transaction by their outlets. Heuristic rules of thumb used by managers to spot trouble areas were also programmed into the system, which helped in reducing inventory and labor costs. These examples, albeit anecdotal, are illustrative of how IT provided by the franchisor can enable the transfer of useful knowledge to franchisees. Therefore, we hypothesize that

H1: *Higher internal IT use by the franchisee will lead to higher knowledge transfer effectiveness.*

Internal IT Use and Absorptive Capacity

While most research in the IS literature has argued for an indirect influence of IT use on absorptive capacity through knowledge transfer, recent studies have begun to explore a

direct relationship (Roberts et al. 2012). For example, Pavlou and El Sawy (2006) examine the use of IT and its impact on absorptive capacity in a new product development context. Similarly, Malhotra et al. (2005) examined how information systems can impact absorptive capacity in a supply-chain context. Consistent with this more recent view, we posit here that internal IT use by the franchisee influences its absorptive capacity directly.

In their seminal article laying the groundwork for absorptive capacity, Cohen and Levinthal (1990) underscore the importance of the structure of communication systems between the organization and its environment as an important source of absorptive capacity. Due to the nature of franchising, wherein the franchisee relies on knowledge from another entity (the franchisor), franchisee absorptive capacity assumes particular importance. Further, because of the business embeddedness of the franchisor and franchisee, they can rely on a centralized and structured interface to communicate (Cohen and Levinthal 1990). Internal IT use assumes the role of a structured interface function that impacts each of the three abilities that make up franchisee absorptive capacity: the ability to recognize, assimilate, and apply knowledge. First, internal IT use can facilitate franchisee recognition of new knowledge since IT systems are able to represent information in multiple ways to serve diverse needs (Malhotra et al. 2005). For example, Bradach (1998) describes how the information system at KFC outlets enabled the rapid and thorough analysis of field tests that recognized the potential new product ideas. Second, internal IT use also impacts the assimilation of knowledge, that is, the social process of linking new knowledge to the franchisees' own experiences of their localized conditions (Nonaka and Takeuchi 1995). Internal IT can present information in ways that reduce the effort in interpreting and synthesizing new insights (Alavi and Leidner 2001; Malhotra et al. 2005; Pavlou and El Sawy 2006). For example, in a multiunit cement manufacturing context, individual units increased knowledge assimilation through their use of a web portal provided by the headquarters, thereby impacting their absorptive capacity (Mahnke et al. 2005). Finally, franchisor-provided IT can enable the franchisee to apply new improvements to their existing competencies (Zahra and George 2002). For example, Bradach (1998) articulates how the information system provided by Pizza Hut enabled franchisees to apply the strategy of *management by exception*, wherein managers could assess their variance in performance on key indicators, as compared to all other outlets in the district, or even the entire region. Therefore, we hypothesize that

H2: *Higher internal IT use will lead to greater franchisee absorptive capacity.*

Knowledge Transfer Effectiveness, Absorptive Capacity, and Franchisee Performance

Prior literature has supported the notion that knowledge transfer effectiveness increases absorptive capacity (Argote and Miron-Spektor 2011; Caloghirou et al. 2004; Gold et al. 2001). In their seminal article, Cohen and Levinthal (1990) underscore the importance of knowledge transfers within and across units, as an important driver of absorptive capacity development. Several scholars have echoed these arguments that absorptive capacity is enhanced by effective knowledge transfers within the organization (Pawlowski and Robey 2004; Roberts et al. 2012; Teigland and Wasko 2003; Van Den Bosch et al. 1999). Following prior research, we propose that knowledge transfer effectiveness impacts the franchisee's absorptive capacity.

Previous studies have suggested that absorptive capacity of the recipient in knowledge transfer relationships depends on the extent to which the recipient's knowledge base overlaps with the source. The underlying reason is that new ideas are learned by associating them to what is already known (Reagans and McEvily 2003). Therefore, knowledge transfer effectiveness is necessary to generate the associations required to absorb new knowledge (Van Den Bosch et al. 2003). Effective knowledge transfer to the franchisee increases the knowledge overlap between the franchisee and headquarters, and thus enhances the franchisees ability to generate associations with new knowledge with their existing knowledge base. These associations increase the franchisee's ability to not just recognize the value of new knowledge, but also assimilate and apply it (Argote and Miron-Spektor 2011; Lenox and King 2004; Szulanski 1996; Todorova and Durisin 2007; Zahra and George 2002). For example, Dyer and Singh (1998) articulate how Toyota transfers knowledge to its suppliers by locating its personnel with the supplier, which enhances the supplier's ability to assimilate and apply new knowledge. Within the franchising context, Bradach (1998) describes how Hardee's franchisees were provided with information on individual line items accompanied by a comparison with regional performance. Franchisees used this knowledge to determine the variance from expected performance on key items, such as food inventory and labor time. These statements not only provided franchisees with a transparent look at their own operations, but also enabled them to realize that controlling the variances was key in maintaining performance. Further, they were able to ascertain specific variance tolerance levels that were pertinent to their own location, and focused their attention on problem areas where these variances were high. Therefore, we hypothesize that

H3: *Higher levels of knowledge transfer effectiveness will lead to higher franchisee absorptive capacity.*

While some researchers have argued that absorptive capacity impacts performance through mediators (Lane et al. 2006; Zott 2003), more recent theoretical treatments also support a direct positive relationship (Volberda et al. 2010). Firms with greater absorptive capacity are more adept at continually replenishing their knowledge stocks and leveraging them to respond to any changes in their environment appropriately (Malhotra et al. 2005; Zahra and George 2002). Several studies have reiterated this positive link between absorptive capacity and performance. For example, Lee et al. (2006) propose that absorptive capacity can reduce the costs involved in supply chains. Prior studies show evidence that absorptive capacity significantly impacts firm performance (Rothaermel and Alexandre 2009; Zahra and Hayton 2008). Within the IS literature, Roberts et al. (2012) have proposed that firm performance is a direct consequence of its absorptive capacity. In the franchising context, franchisees with greater levels of absorptive capacity are more likely to improve their financial performance (Szulanski 1996). Franchisees with greater levels of absorptive capacity will be able to more accurately predict the commercial potential of the new knowledge (Volberda et al. 2010). Therefore, a franchisee with high absorptive capacity will be more efficient in recognizing strategies and tactics that potentially impact their financial performance, and avoiding those that don't. Furthermore, franchisees with greater absorptive capacity will be able to link the new knowledge to its own markets, and will thus be in a strong position to effectively exploit the commercial potential of the new knowledge (Lane et al. 2001). Thus, a franchisee with high absorptive capacity may not only be efficient in acquiring relevant knowledge (regarding, say, changing regulations, customer preferences, disruptive technologies, etc.), but also effective in exploiting the potential opportunities to drive its profitability. For example, Bradach (1998) describes how Hardee's restaurants in Iowa recognized and leveraged the opportunity created by local pork producers to serve pork sandwiches in that state. Thus, greater franchisee absorptive capacity ensures that the franchisee is in a favorable position to leverage opportunities toward enhancing its financial performance. While there are no studies that have specifically examined the link between franchisee absorptive capacity and performance, we rely on Tsai (2001), who examined this link in a distributed multiunit firm context, and found that units with high absorptive capacity can leverage it to increase their financial performance. Therefore, we hypothesize that

H4: *Higher absorptive capacity will lead to greater franchisee performance.*

The Role of Absorptive Capacity as a Mediator

As hypothesized in previous sections, internal IT use will positively impact absorptive capacity of the organization and, further, absorptive capacity in turn impacts the firm's financial performance. However, most empirical examinations have shown no direct effect of IT use on performance (Devaraj and Kohli 2003; Kohli and Devaraj 2003; Tanriverdi et al. 2007). Further, these nonsignificant results have been explained as the result of overlooking mediating variables between IT use and firm performance (Sambamurthy et al. 2003; Tippins and Sohi 2003). Dynamic capabilities, such as absorptive capacity, are often conceptualized as these mediating variables (Malhotra et al. 2005; Pavlou and El Sawy 2006; Roberts et al. 2012). Thus, conceptual arguments as well as empirical results from prior literature suggest that absorptive capacity will mediate the effect of internal IT use on firm performance (Roberts et al. 2012; Tanriverdi 2005). Applying these arguments to franchisees, we hypothesize that franchisee absorptive capacity will mediate the relationship between internal IT use and franchisee financial performance. Internal IT use serves as a conduit for useful information for the franchisee. However, the franchisee's absorptive capacity would play an important role before the new information enabled by internal IT use can impact the franchisee's financial performance. Therefore, we hypothesize that

H5: *Absorptive capacity will mediate the relationship between internal IT use and franchisee performance.*

As discussed in the previous sections, knowledge transfer effectiveness as an antecedent for developing absorptive capacity and, further, that absorptive capacity influences firm performance, are ideas that have been consistently supported in prior literature (Cohen and Levinthal 1990; Volberda et al. 2010). There is, however, scant support for direct influence of knowledge transfer effectiveness on firm performance. Indeed, it has been argued that the mere transfer of useful knowledge will not directly influence an organization's performance (Lane et al. 2001). The lack of a direct influence of knowledge transfer on performance has been attributed to the heterogeneity in local environments (Fiol and Lyles 1985). To bridge the gap between the access of knowledge and its commercial application relevant to its own environment, the firm requires higher levels of absorptive capacity (Cohen and Levinthal 1990). These arguments indicate that the influence of effective knowledge transfer on firm performance is through its absorptive capacity. Similar to these arguments, we propose that absorptive capacity mediates the relationship between knowledge transfer effectiveness and franchisee performance. While the franchisee may acquire useful knowl-

edge, its ability to apply the acquired knowledge to impact its financial performance will depend on its capacity to transform and apply the knowledge to its own strategic context. That is, the franchisee should be able to link the knowledge to its own product markets in meaningful ways by recognizing the commercial potential and exploiting the opportunities it presents before it can impact financial performance. Thus, the franchisee's absorptive capacity is a key mediator between the acquisition of useful knowledge and financial performance. Therefore, we hypothesize that

H6: *Absorptive capacity will mediate the relationship between knowledge transfer effectiveness and franchisee performance.*

Research Method

Contextual Setting

Franchising provides some methodological advantages as a quasi-experimental setting to study organizational learning (Darr et al. 1995; Szulanski and Jensen 2006; Winter et al. 2012). First, the knowledge resources provided by the headquarters are ubiquitous across all franchisee firms. Second, franchisees operate at arm's length and make independent decisions on the use of such knowledge resources provided, indicating that differences in outcomes are more readily attributable to the franchisee's decision on the use of these resources, after controlling for other factors. Third, franchisee firms are more similar to each other in their operations than a random sampling of firms across industries and, thus, are more readily comparable to each other. Thus, examining franchisee learning provides certain advantages as a context to study organizational learning issues.

Given the advantages that the franchising context provides, we chose franchising in the real estate industry as the setting for our study. The real estate industry is highly knowledge intensive, as it is characterized by complex transactions, high reliance on tacit knowledge, high levels of contact with the customer, and high levels of customization (Lovelock 1983). Consistent with prior studies that have used franchising (Darr et al. 1995; Szulanski and Jensen 2006; Winter et al. 2012), we approached RE/MAX LLC, one of the largest U.S. based real estate firms. RE/MAX specializes in residential real estate transactions, but also sells commercial property, conducts real estate auctions, and provides advisory and relocation services. Since its inception in 1973, the company has expanded from a single location to a global network of 100,000 associates located in over 70 regions around the world. RE/MAX enables independent brokerages and new franchise owners to tap into a client base by positioning themselves in the local market more quickly than they could do by themselves. RE/MAX's recruiting motto, "In business for yourself, but not by yourself," is aimed at communicating its business model succinctly. RE/MAX provides its network of franchisees with a strong brand name, proven business practices, training and education, technology, and market knowledge. In return, the franchisees/offices are obligated to endorse the brand and pay RE/MAX ongoing fees, but retain full ownership rights to their operations.[12]

RE/MAX has been a leader in understanding that IT is the foundation of doing business in the digital economy, particularly in an information-intensive industry like real estate (Jesperson 2001). Since the late 1980s, RE/MAX has invested in, and embarked on, several IT initiatives that often lead the industry. This history of investments had been crucial to staying competitive and keeping the franchise network vibrant, by creating opportunities for real estate brokerages as well as entrepreneurial agents. Introduced in 1995, the Remax.com website was one of the first real estate websites in the United States. Through Remax.com, consumers can search for properties in any of the countries served by RE/MAX. Access to relevant resources is made available to both brokers and agents through a password-protected portal, launched in 1998, called Mainstreet. Under the broad umbrella of Mainstreet, RE/MAX has provided access to IT focused on various aspects of the real-estate business. LeadStreet, a lead-generation and lead-management system for affiliates in the United States and portions of Canada, was introduced in 2005, and enables franchisees to send and receive referrals. RE/MAX Design Center, announced in 2006, offers a full suite of online marketing tools including brochures, flyers, presentation cards, printing and mailing services, ad campaigns, electronic greeting cards, virtual tours, slide shows, and multimedia presentations—complete with web traffic reporting tools to identify the success or failure of online marketing campaigns. RE/MAX University, unveiled in 2007, encompasses a training service that allows agents to obtain knowledge and certifications about specific areas of the real-estate business.

The learning process is highly context dependent (Argote and Miron-Spektor 2011). To better understand the organization and its context in order to inform the survey development, we conducted interviews, on-site observations, and documentation review. The documentation reviewed included annual reports, company archival analyses, past internal surveys, organizational charts, newspaper articles mentioning RE/MAX, and archival reports from the National Association

[12]Corresponding to the colloquial use of the term *office* to refer to *franchisees*, we use these terms interchangeably.

of Realtors. We conducted 29 interviews with middle and top managers, broker managers, broker owners, and agents. We performed on-site observation of four different RE/MAX offices. The interviews provided examples on how internal IT was being used. For example, one initiative was to share video documentaries of successful agents through Mainstreet, so that other agents could observe their practices. Mainstreet was also leveraged for sharing effective listing presentations as well as information on short-sales and foreclosures. Albeit anecdotal, the interviews and observations also established the relevance of our research model. For example, a franchise owner stated,

> [Some] shied away from technology because I think they felt like it was going to dilute the face to face communication. And I looked at it a little bit differently and I realized that that doesn't have to be the case. I can use technology to gain an even deeper relationship….I knew more about the people, because of technology….There are some very valid and legitimate ways that technology is really important.

Measurement of Variables

Data collected for this study came from three distinct sources: data from the centrally managed franchise membership database, census data, and a survey instrument directed to the owners and managers of franchisee locations located all over the United States.

Independent Variables: Since we did not find any readily applicable measurement, we decided to develop new measures for the *internal IT use* construct. Internal IT use was measured as the extent to which a franchisee used Mainstreet to access the various resources provided by RE/MAX. Thus, four items were developed which aimed to tap into the extent of use of IT provided by RE/MAX.

While we found prior studies that measured *knowledge transfer effectiveness* (for example, Ko et al. 2005), the items were not found to be readily applicable to our research context. In this study, we decided to measure knowledge transfer effectiveness by developing a reflective (primary measure) and a formative (supplemental measure) scale. This decision was driven by two important reasons. First, multiple measures can allow researchers to examine the content validity of their measurement items (Diamantopoulos and Winklhofer 2001). Second, we avoid the common pitfalls of misspecification of constructs (Jarvis et al. 2003). Based on our interviews and our review of prior research, we developed a six-item reflective scale and a three-item formative scale to measure knowledge transfer effectiveness. Theoretical considerations as well as empirical considerations may drive scale development efforts (Coltman et al. 2008). In developing the reflective scale, we primarily focused on the nature of the construct (Ko et al. 2005; Argote and Ingram 2000). Empirical (collinearity) and contextual (adequate coverage of key dimensions) factors drove the development of the formative measures (MacKenzie et al. 2005). Through interviews and review of RE/MAX internal surveys and documents, we identified three specific areas. These include agent management activities, marketing and selling properties, and IT/office administration support.

In prior IS research, absorptive capacity has often been operationalized as an asset, rather than a dynamic capability (Roberts et al. 2012). Therefore, consistent with prior arguments that underscore the importance of using survey measures to measure absorptive capacity as a dynamic capability (Pavlou and El Sawy 2006; Roberts et al. 2012), absorptive capacity was measured by adapting the 10 items developed by Pavlou and El Sawy (2006).

Dependent Variable: We measured franchisee firm performance as the percentage growth in franchisee firm commissions for 2010 and 2011.While we acknowledge that performance is a multidimensional construct and alternative specifications of performance can be construed (for example, agent satisfaction, new agent recruitment, etc.), growth in annual commission reflects the revenues generated by the franchisee and is the outcome of immediate importance to franchise owners. In addition, financial growth has been found to be a good proxy for firm performance, and has been used in prior studies (He and Wong 2004). Therefore, we argue that this measure more accurately reflects the performance of the franchisee.

Control Variables: Several control variables were used in this study. We discovered that franchisees sometimes use IT services not provided by the headquarters to stay current with broad industry trends and local market developments (such as The National Association of Realtors blog, ActiveRain.com, RealTrends.com, etc.). Therefore, we controlled for external IT use by franchisees in this study. We measured external IT use using a four-item survey instrument as the extent to which the franchisee used IT that is not provided by headquarters. Since newer offices joining the network may not reflect complete understanding of RE/MAX resources and practices, we controlled for the age of the office, operationalized as the number of years that it has belonged to RE/MAX. In addition, we controlled for whether the office had converted from another real-estate organization using a dichotomous variable, conversion. Since multiunit franchises are likely to transfer knowledge between units, which may impact perfor-

mance (Kalnins and Mayer 2004; Winter et al. 2012), we controlled for the number of offices that were owned by the owners of the focal franchisee as multiunit size. Office size has been recognized as an important variable impacting the relationship between strategy and performance (Dobrev and Carroll 2003; Hofer 1975; Volberda et al. 2012). Consistent with prior studies (Achrol and Kotler 1999), we controlled for office size, measured as the total number of active agent work days for the year. We controlled for the total experience of owners and managers for the franchising unit since more experienced management may be more capable at avoiding common pitfalls. The extent of the franchisee's local market-share as the number of its agents divided by the total number of RE/MAX agents in the county, termed local franchise domination, was used as a control in the study. Since the impact of the economic downturn has been more severe in some regions than others, we controlled for the region in which the office was located. Four dummy coded variables were constructed to control for the five regions of the United States (west, midwest, southwest, south, northeast), with the western region as the baseline. Finally, we control for prior performance of the franchisee by including the prior year commissions (i.e., the total commissions for the calendar year 2010) of the franchisee. To aid with distributional assumptions, all of the control variables were log transformed prior to being used in the model.

Data Collection

An initial feedback about the face validity of the items was provided by members of the RE/MAX management team and three IS researchers. Following this, two pilot studies were conducted. The online survey was targeted to the owners and/or managers of franchises located all over the United States. In the first pilot, a random sample of 200 owners and managers from the complete list of 4,202 owners/managers were emailed a link to the survey, along with an introductory cover letter from the CEO explaining the purpose of the study and encouraging response. We received 45 responses to the first pilot survey. Principal components analysis (PCA) of the reflective items indicated no concerns. Based on the comments received, modifications were made to the instruments to increase clarity. Changes were primarily made to the write-ups preceding the survey items. After the changes, we conducted a second pilot by sending the survey to a second random sample of 200 owners and managers, and received 38 responses. Results from the second pilot provided satisfactory evidence of the reliability and validity of the items. In the full survey, we polled the remaining member constituency of 3,802 owner/managers over a three week period during July–August 2011, and received 976 responses (25.6% response rate). After closing the survey, we removed responses from offices that did not have historic performance data, resulting in a final sample of 783 unique offices (27.49%) out of 2,848 offices, and 882 unique respondents out of 3,802 owners/managers (23.19%). All secondary data, including performance data, was collected in February 2012 from RE/MAX's centrally managed database. RE/MAX collects performance and other data for each of its franchisees at the end of each calendar year. Thus, commissions for an office for 2011 is the total commissions generated by the office in the entire calendar year (January to December, 2011). Characteristics of the respondents and the offices are provided in Table 2.

Measurement Model Analysis

Table 3 summarizes Cronbach's alpha, composite reliability, and the average variance extracted (AVE) for the reflective constructs: internal IT use, absorptive capacity, knowledge transfer effectiveness, and the control variable external IT use. Coefficient alpha values range from 0.83 to 0.96, well above the recommended 0.707 threshold (Nunnally and Bernstein 1994). Similarly, composite reliabilities range from 0.83 to 0.97, exceeding the recommendation of .70 (Straub 1989). The AVE for each construct is larger than the correlation of each construct with all other constructs, thus indicating adequate discriminant validity. In addition, the square root of the AVE for each construct exceeds the cutoff of 0.5 (Fornell and Larcker 1981; Hair et al. 1998). Item loadings on their constructs were highly significant ($p < .001$), and were significantly larger than cross loadings, indicating convergent validity. While the loading for one item, abscap_1, was slightly below 0.7, we decided to retain it in the analysis since it was close to the recommended threshold. To test the validity of the formative knowledge transfer effectiveness scale, a multiple indicators and multiple causes (MIMIC) model was used (Diamantopoulos and Winklhofer 2001; Jöreskog and Goldberger 1975; Vinzi et al. 2010). The results of the MIMIC model, provided in Appendix A, indicate that the formative and reflective scales of knowledge transfer effectiveness share a large amount of variance. The weights of the three formative items are statistically significant. These results provide strong support for the reliability and validity of the scales used in this study.

We conducted a comparison of the four-factor measurement model (internal IT use, absorptive capacity, reflective measures of knowledge transfer effectiveness, and the control variable external IT use) against three other models to ensure discriminant validity (Anderson and Gerbing 1988; Choi et al. 2010): the null model, a one factor model with all 24 items loading onto a single factor, and a three-factor model with internal and external IT use items loading to one factor. The

Table 2. Demographic Characteristics of the Sample

Respondent Characteristics (n = 882)						Office Characteristics (n = 783)					
Tenure	**Freq.**	**Percent**	**Age†**	**Freq.**	**Percent**	**Agents**	**Freq.**	**Percent**	**Office Age**	**Freq.**	**Percent**
< 5	111	12.59	20-29	8	0.95	< 10	171	21.84	< 5	101	12.90
5–9	224	25.40	30–39	69	8.21	10–19	207	26.44	5–9	202	25.80
10–14	201	22.79	40–49	180	21.43	20–29	135	17.24	10–14	125	15.96
15–19	163	18.48	50–59	284	33.81	30–39	101	12.90	15–19	131	16.73
20–24	116	13.15	60–69	250	29.76	40–49	62	7.92	20–24	126	16.09
25–29	54	6.12	70–79	48	5.71	50–59	39	4.98	25–29	71	9.07
30–34	12	1.36	> 80	1	0.12	60–69	27	3.45	30–34	21	2.68
> 34	1	0.11				> 69	41	5.24	> 34	6	0.77
Gender	**Freq.**	**Percent**	**Experience††**	**Freq.**	**Percent**	**Conversion**	**Freq.**	**Percent**	**Multiunit Size**	**Freq.**	**Percent**
Male	509	57.71	< 10	107	12.17	No	738	94.25	< 5	707	90.29
Female	373	42.29	10–19	280	31.85	Yes	45	5.75	5–9	47	6.00
Role	**Freq.**	**Percent**	20–29	282	32.08	**Region**	**Freq.**	**Percent**	10–14	9	1.15
Manager	154	17.46	30–39	166	18.89	West	152	19.41	15–19	3	0.38
Owner	349	39.57	40–49	42	4.78	Midwest	98	12.52	20–24	10	1.28
Owner &	379	42.97	> 49	2	0.23	Southwest	182	23.24	> 24	7	0.89
Manager						South	204	26.05			
						Northeast	147	18.77			

†n = 840, age data missing for 42 individuals; ††n = 879, experience data missing for 3 individuals; percentages may not add up to 100 because of rounding

Table 3. Survey Items, Loadings and Cross Loadings (n = 783)

Measure	Item Text	Loadings and Cross Loadings			
Absorptive Capacity: Alpha = .95, C.R. = .95, AVE = .65, Square Root of AVE = .81					
abscap_1	We are successful in learning new things within our office	0.69	0.12	0.15	0.25
abscap_2	Our office is effective in developing new knowledge or insights that have the potential to influence our business	0.72	0.07	0.17	0.22
abscap_3	Our office is able to identify and acquire internal (e.g.,within the office) and external (e.g.,market) knowledge	0.74	0.05	0.09	0.23
abscap_4	Our office has effective routines to identify, value, and import new information and knowledge	0.81	0.13	0.09	0.19
abscap_5	Our office has adequate routines to analyze the information and knowledge obtained	0.84	0.13	0.08	0.12
abscap_6	Our office has adequate routines to assimilate new information and knowledge	0.85	0.12	0.09	0.10
abscap_7	Our office can successfully integrate our existing knowledge with the new information and knowledge acquired	0.84	0.19	0.10	0.15
abscap_8	Our office is effective in transforming existing information into new knowledge	0.82	0.16	0.12	0.15
abscap_9	Our office can successfully exploit internal and external information and knowledge into concrete applications	0.82	0.20	0.13	0.14
abscap10	Our office is effective in utilizing knowledge in new services	0.77	0.21	0.13	0.16

Table 3. Survey Items, Loadings and Cross Loadings (n = 783) (Continued)

Measure	Item Text	Loadings and Cross Loadings			
Internal IT Use: Alpha = .90, C.R. = .91, AVE = .71, Square Root of AVE = .84					
int_use_1	Our office always uses technology provided by RE/MAX	0.17	0.81	0.03	0.25
int_use_2	Our office makes use of the complete range of functionality provided by RE/MAX technologies	0.23	0.83	0.11	0.21
int_use_3	RE/MAX technologies are completely ingrained in our business practices	0.23	0.84	0.14	0.27
int_use_4	The technologies that we use are provided by RE/MAX	0.13	0.76	-0.14	0.37
External IT Use: Alpha = .83, C.R. = .83, AVE = .56, Square Root of AVE = .75					
ext_use_1	Our office builds or acquires technologies from sources other than RE/MAX	0.08	-0.04	0.81	-0.10
ext_use_2	Our office always searches for new technologies to complement our business practices	0.25	0.16	0.82	-0.03
ext_use_3	Our office frequently looks outside of RE/MAX for new technologies	0.13	-0.08	0.83	-0.20
ext_use_4	Our office complements the suite of RE/MAX technologies with other technologies	0.20	0.24	0.71	0.23
Knowledge Transfer Effectiveness (Reflective): Alpha = .96, C.R. = .97, AVE = .82, Square Root of AVE = .91					
kte_ref_1	RE/MAX provides my office with necessary and useful knowledge	0.18	0.12	-0.05	0.88
kte_ref_2	My office knowledge base is enhanced by RE/MAX	0.15	0.15	0.01	0.90
kte_ref_3	My office has gained a lot of knowledge from RE/MAX	0.16	0.19	-0.03	0.91
kte_ref_4	My office perceives RE/MAX to be a useful source of knowledge	0.13	0.22	-0.04	0.87
kte_ref_5	My office often obtains useful knowledge from RE/MAX	0.17	0.19	-0.03	0.89
kte_ref_6	Overall the interactions of my office with RE/MAX has increased our knowledge levels	0.14	0.19	-0.02	0.90
Knowledge Transfer Effectiveness (Formative)					
For the following survey items, consider whether RE/MAX LLC provides you with all the necessary knowledge to perform these activities at your office		**Weight**	**T**	**p-value**	
kte_for_1	Recruiting, training, and retaining agents	0.3	8.86	< 0.001	
kte_for_2	Marketing and selling properties	0.44	12.47	< 0.001	
kte_for_3	Technology and administrative functions	0.11	3.09	0.002	

Table 4. Comparisons of Measurement Models

Model	RMSEA	AIC	BIC	CFI	TLI	SRMR	CD	χ2	df	
M0: Null Model								17273.30	276	
M1: One-factor model	0.22	50383.06	50718.80	0.46	0.41	0.18	0.96	9358.17	252	
M2: Three-factor model	0.12	43901.17	44250.91	0.85	0.83	0.11	1.00	2870.28	249	
M3: Four-factor model	0.09	42781.61	43145.34	0.91	0.90	0.08	1.00	1744.72	246	
Model Comparisons								**Δχ2**	**Δdf**	**p-value**
M0 – M1								7915.13	24	0.00
M1 – M2								6487.89	3	0.00
M2 – M3								1125.56	3	0.00

Table 5. Paired T-Tests

	Absorptive Capacity		Knowledge Transfer Effectiveness (Reflective)		Knowledge Transfer Effectiveness (Formative)		Internal IT Use		External IT Use	
	t	(p-val)	t	(p-val)	t	(p-val)	t	(p-val)	t	(p-val)
Age[††]	1.33	(0.19)	0.70	(0.48)	1.57	(0.12)	1.88	(0.06)	2.04	(0.04)
Experience	1.49	(0.14)	0.44	(0.66)	-0.76	(0.45)	-0.81	(0.42)	0.28	(0.78)
Tenure	-0.11	(0.91)	-0.25	(0.80)	1.40	(0.16)	-0.42	(0.68)	-0.15	(0.88)
Response Date	1.14	(0.26)	-0.09	(0.92)	0.66	(0.51)	-0.97	(0.33)	0.67	(0.50)
Gender[†]	1.86	(0.07)	1.48	(0.15)	1.94	(0.06)	2.08	(0.04)	-1.31	(0.20)

p-values are two tailed; n = 113 pairs; [†]n = 49 pairs; [††]n = 106 pairs

comparisons are shown in Table 4. The difference in Chi-square statistics indicates the superiority of the fit of the theorized measurement model, as compared to the other models.

To check for the extent of common method bias due to single respondents, we conducted several tests based on Podsakoff et al. (2003). First, we conducted the one-factor Harman test using all the reflective items in an exploratory factor analysis. The unrotated factor solution resulted in four factors with eigenvalues greater than one. No single factor accounted for the majority of the variance. Second, we tested for the impact of including a latent method factor in the model by allowing all indicator variables to load on this factor in addition to their respective constructs. We found minimal reduction in the loadings of each item onto their construct. Further, all predicted paths retained their significance after controlling for the possibility of a single method factor. Since conventional tests of common method bias have been called into question (Chin et al. 2012), we conducted additional analyses to examine the extent of common method bias.

Since 87 of the 783 offices in our sample had more than one respondent, we were able to compare multiple responses from the same office through the use of paired t-tests. Of these 87 offices, 77 had exactly two owner/manager respondents, 8 had exactly three, and 2 had exactly four respondents. From the 8 three-respondent offices, we generated 24 pairs by considering all possible combinations of respondents. Similarly, we generated 12 all-possible pairs from the 2 four-respondent offices. Therefore, we had 113 pairs of respondents rating all scale items. We then conducted paired difference t-tests after classifying each owner/manager respondent into one of two groups based on age, experience, tenure, response date, and gender (after dropping all same-gender pairs; sample size n = 46). The results of the pairwise t-tests are provided in Table 5. None of the t-tests were significant at the 0.01 level. Since paired t-tests are a powerful statistical method to demonstrate group differences, the lack of significant differences indicates that responses reflect a true value of the measure for each office. The evidence from the paired t-tests in combination with the conventional common method bias tests that were conducted suggests that common method bias is not an issue of concern in this study. For multiple-respondent offices, we calculated the average rating before testing our hypotheses.

To examine the extent of any systematic nonresponse bias in the sample, t-tests between early (first quartile) and late (fourth quartile) responders to the survey were conducted. Tests were conducted on both archival variables as well as survey variables. The tests revealed no significant differences between the two groups. Similar tests after median splitting the respondents into two halves also indicated no differences. In addition, we conducted a Chi-square test for the goodness of fit, based on the population distribution of the number of offices in all 50 states and the District of Columbia. The Chi-square value of 60.61 (p-value = 0.167) indicates that the sample distribution of offices by states is similar to the population. These results indicate the lack of a systematic response-bias.

Structural Model Analysis

Table 6 summarizes the descriptive statistics and correlations among the variables used in the analysis of the structural model. Covariance-based structural equation modeling was used to conduct data analysis, rather than component-based approaches such as PLS. Two reasons drove this choice. First, our sample is fairly large and the model does not contain second-order formative constructs. In addition, our explanatory and mediating variables were measured using multiple items and, therefore, modeling the measurement error was an important consideration. Thus, covariance-based SEM is more appropriate than PLS. We used the statistical package, Stata Release 12 (StataCorp 2011) to conduct our analysis.

Table 6. Summary Statistics and Correlations (n = 783)

	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12
1. Absorptive Capacity	5.62	0.86	1											
2. Internal IT Use	4.75	1.22	0.43*	1										
3. External IT Use	5.50	0.96	0.33*	0.14*	1									
4. Knowledge Transfer Effectiveness (Reflective)	5.84	1.06	0.38*	0.51*	-0.02	1								
5. Knowledge Transfer Effectiveness (Formative)	5.43	1.17	0.34*	0.51*	-0.06	0.74*	1							
6. Office Age	14.00	8.42	0.03	-0.05	0.00	-0.02	-0.02	1						
7. Multiunit Size	2.57	4.77	0.08	-0.01	0.10*	-0.06	-0.07	0.06	1					
8. Conversion	0.06	0.23	0.06	0.03	0.00	0.09	0.09	-0.29*	-0.04	1				
9. Owner/Manager Experience	38.50	27.89	0.05	-0.02	0.00	-0.03	-0.03	0.34*	0.03	-0.08	1			
10. Office Size	8034	7135	0.18*	0.01	0.15*	0.43	-0.01	0.39*	0.18*	-0.10*	0.36*	1		
11. Prior Performance	1718050	1947113	0.15*	-0.07	0.12*	0.00	-0.05	0.43*	0.18*	-0.11*	0.39*	0.88*	1	
12. Local Franchise Domination	0.61	0.38	0.00	0.01	-0.07	0.09	0.09	0.04	-0.08	-0.03	-0.01	-0.05	-0.07	1
13. Financial Growth	0.00	0.44	0.11*	0.12*	-0.01	0.10*	0.12*	-0.17*	0.00	0.14*	-0.07	0.06	-0.08	0.09

* $p < .01$

Table 7 presents the statistical results of the structural model. Hypothesis 1, which predicted a positive relationship between internal IT use and knowledge transfer effectiveness, is strongly supported (coefficient = 0.555, $p < 0.001$). Hypothesis 2 predicted a positive relationship between internal IT use and absorptive capacity and (coefficient = 0.281, $p < 0.001$) and is also supported. Hypothesis 3 predicted a positive relationship between knowledge transfer effectiveness and absorptive capacity and is also strongly supported (coefficient = 0.248, $p < 0.001$). Absorptive capacity was hypothesized to positively impact financial performance. The path coefficient is highly significant (coefficient = 0.119, $p < 0.001$), providing support for hypothesis 4.

Hypothesis 5 predicted that absorptive capacity will mediate the relationship between internal IT use and firm performance. To test this hypothesis, a direct path was drawn from internal IT use onto financial growth (represented as a dashed line in Figure 2). This direct link was not significant. We also compared model fit of the baseline model (proposed in Figure 2) to the model with the direct path added to it. While the fit indices are similar across the two models, the addition of the direct path did not significantly improve the model fit (difference in $\chi^2 = 0.001$, difference in d.f. = 1, $p > 0.1$). The comparison of the two models is provided in Table 8. After establishing complete mediation, we followed the advice of Shrout and Bolger (2002) to assess the strength of mediation by calculating the effect ratio.[13] The effect ratio was found to be higher than one, indicating full mediation. These results indicate support for hypothesis 5. We followed a similar process to test if absorptive capacity completely mediated the relationship between knowledge transfer effectiveness and performance. The comparison between the hypothesized model and the model with the direct paths is provided in Table 8 (difference in $\chi^2 = 0.334$, difference in d.f. = 1, $p > 0.1$). Further, the effect ratio was also found to be greater than 1, indicating support for hypothesis 6.

The results of testing the hypothesized structural equation model are shown in Figure 3.[14] Table 9 presents the results of the hypotheses tested in this study. The squared multiple correlations (equation level R-squares) for knowledge transfer effectiveness (0.319), absorptive capacity (0.371), and franchisee performance (0.265) indicate that the predictors account for a moderate amount of variance in these variables. To test the stability of the results, we used the log of commissions for 2011 as the dependent variable rather than financial growth as in our original specification. The alternative specification of the dependent variable yielded very similar results to the primary model, available in Appendix B. Similarly, we also tested the alternate specification of knowledge transfer effectiveness using the formative construct and found similar results (also provided in Appendix B). Further, we ran three models with each of the knowledge transfer effectiveness formative items used as single-item constructs

[13] $P_m = \hat{a} * \hat{b} / \hat{c}$.

[14] Paths from all control variables were drawn to knowledge transfer effectiveness, absorptive capacity, and firm performance.

Table 7. Path Coefficients

	Knowledge Transfer Effectiveness		Absorptive Capacity		Financial Growth	
	β	**(SE)**	**β**	**(SE)**	**β**	**(SE)**
Constant					4.163***	(0.512)
Owner/Manager Experience	-0.050	(0.035)	0.033	(0.034)	-0.026	(0.035)
Office Age	-0.015	(0.040)	0.003	(0.039)	-0.098**	(0.040)
Conversion	0.067**	(0.034)	0.038	(0.033)	0.054	(0.033)
Multiunit Size	-0.036	(0.034)	0.026	(0.033)	-0.005	(0.034)
Office Size	0.040	(0.065)	-0.013	(0.063)	0.813***	(0.061)
Prior Performance	0.032	(0.071)	0.106*	(0.068)	-0.807***	(0.067)
Local Franchise Domination	0.074**	(0.033)	0.001	(0.032)	0.106***	(0.032)
Midwest	-0.034	(0.038)	-0.081**	(0.037)	-0.047	(0.038)
Southwest	-0.049	(0.042)	-0.055	(0.041)	-0.055	(0.042)
South	-0.071*	(0.043)	0.032	(0.041)	-0.061	(0.043)
Northeast	-0.023	(0.041)	-0.014	(0.039)	-0.113***	(0.040)
External IT Use	-0.140***	(0.036)	0.295***	(0.034)	-0.058	(0.038)
Internal IT Use	0.555***	(0.029)	0.281***	(0.039)	-0.001	(0.043)
Knowledge Transfer Effectiveness			0.248***	(0.037)	-0.023	(0.040)
Absorptive Capacity					0.119***	(0.041)

Model Fit Statistics**: d.f.** = 496; **χ2** = 2033.928; **RMSEA** = 0.063; **AIC** = 55833.234; **BIC** = 56793.84; **CFI** = 0.911; **TLI** = 0.897; **SRMR** = 0.055; **CD** = 0.992

Table 8. Model Fit Comparisons

	χ2	**Δχ2**	**d.f.**	**Δd.f.**	**RMSEA**	**AIC**	**BIC**	**CFI**	**TLI**	**SRMR**	**CD**
Model with all direct paths	2033.93		496		0.063	55833.23	56793.84	0.911	0.897	0.055	0.992
Model with path from *Internal IT Use* to *Financial Growth* omitted **(H5)**	2033.93	0.001	497	1	0.063	55831.24	56787.18	0.911	0.897	0.055	0.992
Model with path from *Knowledge Transfer Effectiveness* to *Financial Growth* omitted **(H6)**	2034.26	0.334	497	1	0.063	55831.57	56787.51	0.911	0.897	0.055	0.992

Δ = the difference between the model with all direct paths and models with omitted path.

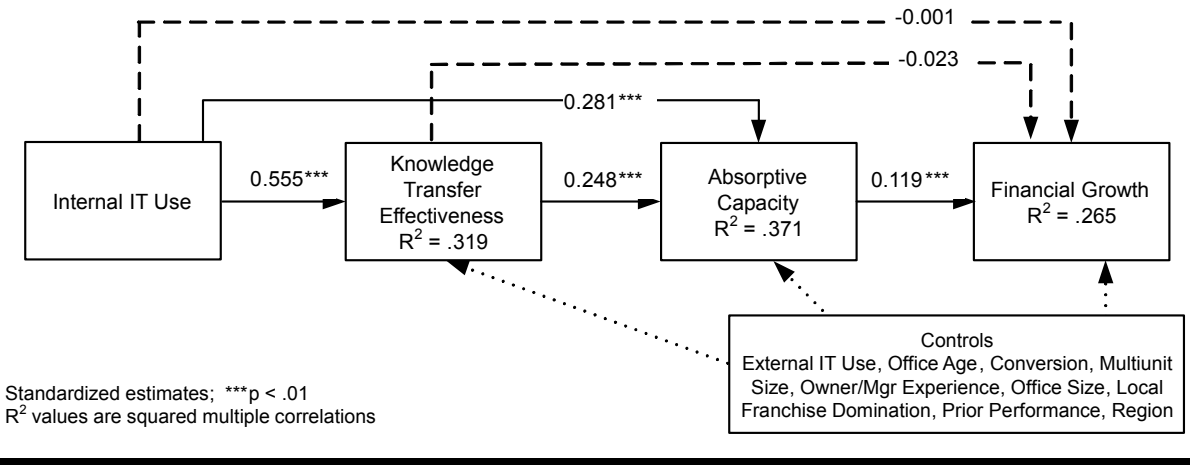

Figure 3. Results from Model with Direct Path

Table 9. Summary of Hypotheses Testing

	Result
H1: Higher internal IT use by the franchisee will lead to higher knowledge transfer effectiveness.	Supported
H2: Higher internal IT use will lead to greater franchisee absorptive capacity.	Supported
H3: Higher levels of knowledge transfer effectiveness will lead to higher franchisee absorptive capacity.	Supported
H4: Higher absorptive capacity will lead to greater franchisee performance.	Supported
H5: Absorptive capacity will mediate the relationship between internal IT use and franchisee performance.	Supported
H6: Absorptive capacity will mediate the relationship between knowledge transfer effectiveness and franchisee performance.	Supported

and found significant results for knowledge transfer of each operational area. These results indicate that the impact of internal IT use is important for knowledge transfer effectiveness across functional areas.

Discussion

Contributions and Implications

The goal of this study is to investigate the role of IT in organizational learning. We began by theorizing about this role and proposed the learning mechanisms–outcomes framework. We then applied the framework to the franchisee learning context to derive our research model where we conceptualized internal IT use by franchisees as a learning mechanism that impacts knowledge transfer effectiveness, absorptive capacity, and franchisee financial performance. The findings, based on data from the franchise membership database, census data, and survey data from a large sample of 783 franchisees, render support for IT use as a learning mechanism that impacts financial performance through its impact on learning outcomes.

The study provides four main contributions to the IS literature. First, it enhances our understanding of the role of IT use in organizational learning by empirically investigating the impact of IT use on knowledge transfer effectiveness (first-order outcome) and absorptive capacity (second-order outcome). Our results indicate that internal IT use enables the transfer of useful knowledge. Further, in investigating the impact of internal IT use on the formative knowledge transfer construct, we found that the transfer of useful knowledge through IT use does not depend on the specific operational area. These results broadly support arguments that IT use may have an important role to play in the transfer of various types of knowledge which enables responses to market changes (Alavi and Leidner 2001; Kane and Alavi 2007). Our results indicate that internal IT use has a significant

impact on building franchisee absorptive capacity. Prior research has lamented that little is understood about the organizational antecedents of absorptive capacity (Volberda et al. 2010). This study fills this gap by establishing the relationship between IT use and absorptive capacity. The results demonstrate that the nature of this influence is not just indirect through enhancing knowledge transfer effectiveness, but also direct. In doing so, we tie absorptive capacity closer to the nomological network of IS research, and reiterate the importance of IT use as an antecedent of absorptive capacity (Roberts et al. 2012). Furthermore, we also find that external IT use also has a significant impact on franchisee absorptive capacity. This indicates that franchisees increase their absorptive capacity through IT use, regardless of the source of such IT.

Second, the empirical results of the model affirm the conceptualization of IT use as a crucial organizational learning mechanism. Research in organizational learning has consistently and unambiguously underscored the important role of IT as an enabler of organizational learning (Argote and Miron-Spektor 2011; Volberda et al. 2010). However, there are few IS studies that apply an organizational learning lens to understand the role of IT within organizations. Albeit splintered, prior research has hinted at the importance of IT in enabling learning by focusing either on the first-order or the second-order outcomes of organizational learning. For example, literature on knowledge management systems has supported the role of IT as an enabler of various knowledge outcomes (Alavi and Leidner 2001). On the other hand, IS studies have found support that IT use impacts dynamic capabilities (Pavlou and El Sawy 2006). In conceptualizing IT use as a learning mechanism, this study not only bridges the gap between these two traditions, but also helps to underscore the role of IT as being much broader than a just an organizational tool with a narrow purpose. When sociotechnical properties of the IT artifact are combined with intentional human action through its appropriation, IT use is a structural arrangement that has important implications on learning within organizations (Orlikowski 2000). This conceptualization of IT use as a learning mechanism paves the way to a profound understanding and richer appreciation of its role within organizations.

Third, through the inclusion of financial performance, this study improves our understanding of the value that IT use provides, and how such value can be expected. Finding a relationship between IT and firm financial performance has been a persistent question in IS research, primarily because of the mixed results of empirical studies (Devaraj and Kohli 2003; Kohli and Devaraj 2003; Tanriverdi 2005). These mixed results have been explained as the result of overlooking key mediating variables between IT use and firm performance (Sambamurthy et al. 2003; Tippins and Sohi 2003). Dynamic capabilities such as absorptive capacity are often conceptualized as these important mediating variables (Malhotra et al. 2005; Pavlou and El Sawy 2006; Roberts et al. 2012). Our study is the first to examine the critical role of absorptive capacity as a mediator between IT use and firm performance. In doing so, this study improves our understanding of the value that IT use provides, and how such value can be expected.

Fourth, this study proposes a theoretical framework that offers the potential to unify diverse perspectives by providing a lens on how related concepts, such as organizational learning, knowledge management, and dynamic capabilities, fit together (Easterby-Smith and Prieto 2008; Vera et al. 2011). Three aspects of the framework are important to highlight. One, it bridges the widening gap between process and content theories of organizational learning. Without discarding each of the unique advantages of process and content theories, the framework integrates them by retaining the richness of explanation of process theories with tractability of empirical research of content theories. Two, the framework provides a lens to understand how learning underpins the creation and renewal of dynamic capabilities (Zollo and Winter 2002). Rather than assuming that dynamic capabilities evolve through unpredictable and idiosyncratic processes, the framework allows the understanding that dynamic capabilities can be nurtured through specific organizational actions that serve to promote learning within organizations. Three, through the conceptualization of learning mechanisms as identifiable organizational structures or routines, the framework makes it possible to investigate the impact of various strategic organizational actions on relevant first- and second-order learning outcomes.

In this study, we have applied the framework within a specific interfirm network context (i.e., franchising). We believe that the framework could potentially be used to understand IT-enabled organizational learning in other contextual situations, through the appropriate choice of first- and second-order outcomes. The framework can be useful in examining IT-based learning within other types of interfirm networks such as strategic alliances, distributed multiunit firms, etc. For example, applying the framework to a supply-chain context, research could examine how collaborative IT use between supply chain partners can lead to knowledge sharing and supply-chain agility and thus impact relationship performance (Alinaghian et al. 2012; Malhotra et al. 2005; Sambamurthy et al. 2003). Further, the framework may be useful in examining how IT can impact organizational learning *within* organizations. IS research has explained the role of knowl-

edge management systems that are used to store and disseminate knowledge within firms (Alavi and Leidner 2001). For example, applying the framework in a new product development context, research could examine how IT use can lead to knowledge integration and build new product development capabilities (Bharadwaj 2000; Pavlou and El Sawy 2006). In addition, the framework could potentially prove useful in investigating common non-IT-based organizational learning mechanisms (such as post-project reviews, executive succession, strategic alliances, etc.) to understand their impact on learning outcomes and performance.

For practice, this study has two main implications. First, our study provides an example, in the context of franchising, showing that IT use is an important learning mechanism and has a significant impact on knowledge outcomes, dynamic capabilities, and financial performance. This study provides a counterexample to those who have argued a more defensive strategy toward technology, based on the argument that IT use provides little, if any, strategic value to the organization (Carr 2003). Instead, our study suggests that executives should avoid viewing technology as a commodity, and instead aggressively engage in understanding how IT use can enhance learning processes and outcomes, and enhance dynamic capabilities. Specifically, firms need to consider how to develop IT-based organizational learning mechanisms that can potentially impact the higher-order learning outcomes. Firms that recognize these possibilities before others do will continue to differentiate themselves in the marketplace and reap economic rewards. Second, franchising has increasingly become a significant part of the economy (Beheler et al. 2008; Dant 2008; International Franchise Association 2011). The management of knowledge is singularly important in the franchising context (Attewell 1992). Knowledge, however, has been shown to be both "sticky and leaky" (Szulanski and Jensen 2006), implying that it is difficult to transfer to others, and yet it is also difficult to protect it from being transferred to entities when it is not intentional. The use of IT-based systems can serve as an important mechanism in facilitating effective knowledge transfer between the franchisee and franchisor, while at the same time impeding knowledge transfer to other entities. Thus, this study is useful in showing that IT use can play a crucial role in the dissemination of knowledge to franchisees by reducing the stickiness and leakiness of knowledge.

Limitations and Future Research

As is true of any research, this study has several limitations, which can be addressed by future research. The first limitation is in the contextual setting of franchisees as the unit of analysis, and the subsequent choice of knowledge transfer effectiveness and absorptive capacity as the outcomes of interest. The franchising context has served as a sandbox to understand organizational learning and we build on this tradition (Darr et al. 1995; Sorenson and Sorenson 2001; Winter et al. 2012). The contextual setting contributed to the rigor of this research by enabling us to test the hypothesized relationships in a quasi-experimental setting within a knowledge-intensive industry (Winter et al. 2012). As such, the findings could provide insights into contexts that bear close resemblance to franchising, such as geographically distributed multiunit firms (Garvin and Levesque 2008), and multinational companies and their subsidiaries (Kogut and Zander 1993). While these models of network organizations may differ from franchising in several ways, they are also similar in the issues they face with knowledge management (Kostova 1999). Further, our choices of the outcomes were predicated on the importance of knowledge transfer effectiveness in franchising, and absorptive capacity's roots in learning. In other contextual situations that are not similar to franchising, the focal knowledge outcomes may be different. Future studies can use the framework as a guiding lens to determine a research model with pertinent choices of first- and second-order outcomes.

Second, since this paper has focused on absorptive capacity, we do not account for other dynamic capabilities that may explain performance. It has been opined that dynamic capabilities evolve slowly, on the basis of performance feedback (Zollo and Winter 2002). Thus, prior performance may correlate with extant dynamic capabilities, at least to a certain extent. Therefore, we have tried to mitigate, to a small extent, the lack of other dynamic capabilities in the model by controlling for prior performance. In addition, the study's primary contribution is not to explain greater variance in performance, but rather to explain how the primary constructs (internal IT use, knowledge transfer effectiveness, and absorptive capacity) are related to each other. Nevertheless, future research that can investigate the synergies between disparate dynamic capabilities (for example, see Pavlou and El Sawy 2006) may have the added benefit of explaining more variance in firm performance.

Third, while our data was collected from both primary and secondary sources, the primary constructs of this study (internal IT use, knowledge transfer effectiveness, and absorptive capacity) were all measured as multi-item survey responses. We were unable to cross-validate the self-reported items with objective data. This raises the possibility that the relationships between these constructs may be subject to common method bias. We took several steps to test for such bias. These tests revealed that the study's constructs do not

suffer from common method bias. In addition, since there were multiple respondents from each office, we were able to conduct paired-tests. Each pair of respondents independently responded to the same set of questions in the survey. Also, paired-t tests are a powerful statistical test, able to detect differences. Because we did not find any significant differences, we argue that the constructs have not been subject to common method bias in this study. Nonetheless, future research that measures the constructs from separate respondents may serve to alleviate any lingering concerns.

Fourth, it is conceivable that firms may rely on more than one learning mechanism. In this study, while internal IT use is the focal learning mechanism pertinent for franchisees, we have controlled for franchisee external IT use. Future research applying the framework to examine IT-enabled learning in other contexts can select the pertinent learning mechanisms to develop their research model based on their context. For example, in within-firm learning contexts, since the choice to use any external IT may not exist, the provenance of IT (internal versus external) may not be relevant. Thus, in these situations, the relevant learning mechanism may just be the use of focal organizational IT such as a knowledge management system. This also raises the question: Under what circumstances would learning mechanisms interact with each other? We conducted *post hoc* tests to examine if there was an interaction between internal and external IT use on knowledge transfer effectiveness and absorptive capacity, but found no support. Future research can further our understanding by investigating how and whether various learning mechanisms interact to impact learning outcomes. Such comparisons may also help in contrasting IT-enabled and non-IT-enabled learning mechanisms.

Finally, the cross-sectional design of this study impedes us from testing the argument that the outcomes of organizational learning and dynamic capabilities have a reinforcing positive-loop relationship between them (Alavi and Leidner 2001; Szulanski 1996; Roberts et al. 2012). While knowledge transfer effectiveness enhances the focal firm's absorptive capacity, the prior absorptive capacity in turn influences the extent to which knowledge is transferred to the focal firm. Extending these arguments to IT, one can argue that greater levels of absorptive capacity can enhance the firm's ability to build IT infrastructures that enhance its learning (Gold et al. 2001), which in turn increase its absorptive capacity (Robey et al. 2000). Future longitudinal studies can provide insights into the temporal aspects of the development of dynamic capabilities.

Conclusions

This study contributes to research and practice through the theoretical development and empirical investigation of the role of IT use in organizational learning. We empirically examined the relationship between internal IT use, knowledge transfer effectiveness, absorptive capacity, and franchisee performance on a sample of 783 independently owned franchisees using a comprehensive dataset comprised of both primary and secondary data. The overall results indicate support for the argument that IT use impacts knowledge transfer effectiveness, and absorptive capacity, and that the influence of IT use on firm performance is completely mediated by absorptive capacity. The results are stable across the choice of statistical method and the operationalization of financial performance. Our findings suggest that IT use is an important learning mechanism that enables knowledge outcomes and dynamic capabilities within franchisees. Firms need to recognize these impacts of IT use in order to leverage IT to its fullest extent. This might be more important than ever before, given the rapidly changing business environments and investments in IT-based systems to manage knowledge resources. We hope that the findings of this study encourage the continued examination of the role that IT plays in organizational learning, and the outcomes of such learning.

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MIS Quarterly

RESEARCH ARTICLE

INFORMATION TECHNOLOGY USE AS A LEARNING MECHANISM: THE IMPACT OF IT USE ON KNOWLEDGE TRANSFER EFFECTIVENESS, ABSORPTIVE CAPACITY, AND FRANCHISEE PERFORMANCE

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Appendix A

MIMIC Model Analysis

A MIMIC (multiple indicators and multiple causes) model serves as a strong statistical validation technique for a set of formative indicators (Bagozzi 2011; Cenfetelli and Bassellier 2009; Diamontopoulos and Winklhofer 2001; Jöreskog and Goldberger 1975), and can be used when reflective indicators of related constructs to the focal formative construct are available. The method uses the reflective items as a criterion measure to establish the validity of the formative measures (MacKenzie et al. 2005). In its simplest form, a MIMIC model can be used when there are two sets of indicators that are tapping into the same construct, one formative and one reflective. In such a situation, the MIMIC model ties both sets of indicators as tapping into the same construct, wherein the formative indicators act as direct causes of the construct, which in turn are indicated by the reflective items (Diamantopoulos 2011; Diamantopoulos and Winklhofer 2001). We conducted a MIMIC model analysis with the three items that comprise the formative knowledge transfer effectiveness construct, and the six-item reflective knowledge transfer effectiveness construct. The results of the analysis are provided below in Figure A1. The Chi-square statistic of 159.92 (d.f. = 24; p-value < 0.0001) and other fit indices, also provided in Figure A1, indicate that the overall model fit is very satisfactory. In addition, each of the weights of the three formative indicators are statistically significant ($p < 0.01$), indicating that each of the three items contribute directly to the latent variable they are supposed to measure. An R^2 value above 0.33 for such a model is considered moderate (Chin 1998). Our results indicate that a high amount of variation in the reflective adaptation construct is explained by the formative construct. The R^2 value of 0.59 indicates that the formative adaptation construct captures similar variance as that of the reflective knowledge transfer construct. Taken together, the results of the MIMIC model analysis provide strong evidence for the validity of the formative measure of knowledge transfer.

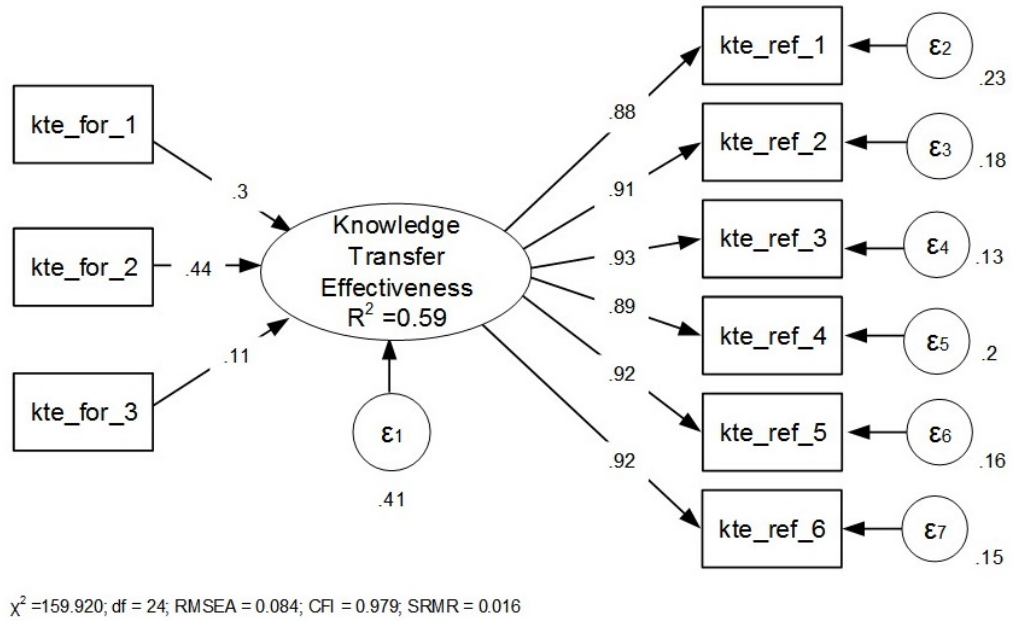

Figure A1. Knowledge Transfer Effectiveness MIMIC Model

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Appendix B

Alternate Specifications of the Research Model

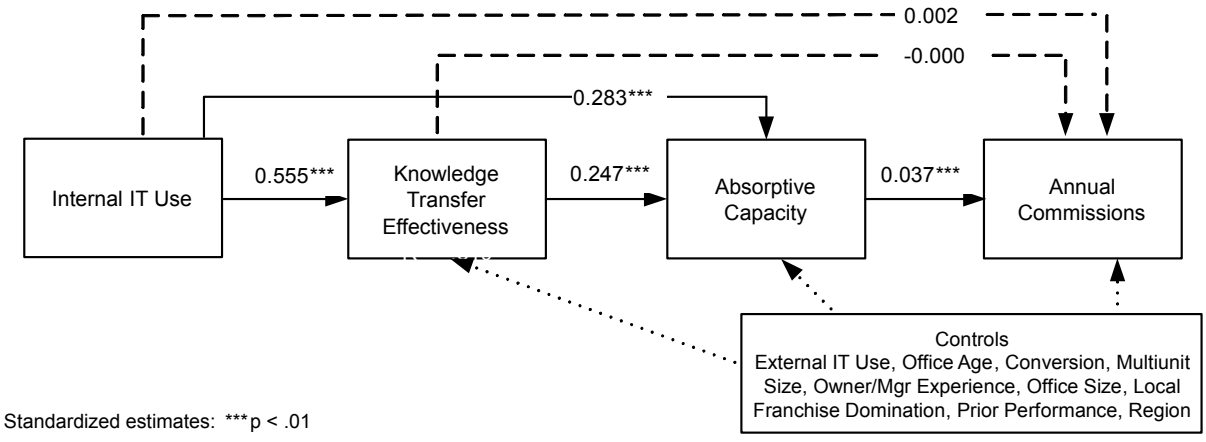

Figure B1. Annual Commissions as the Dependent Variable

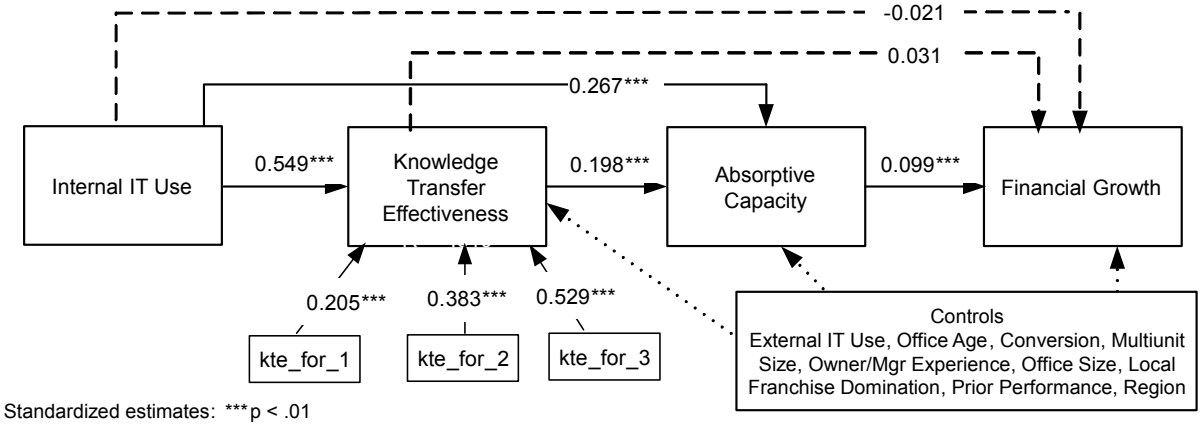

Figure B2. Knowledge Transfer Effectiveness Formative and Growth

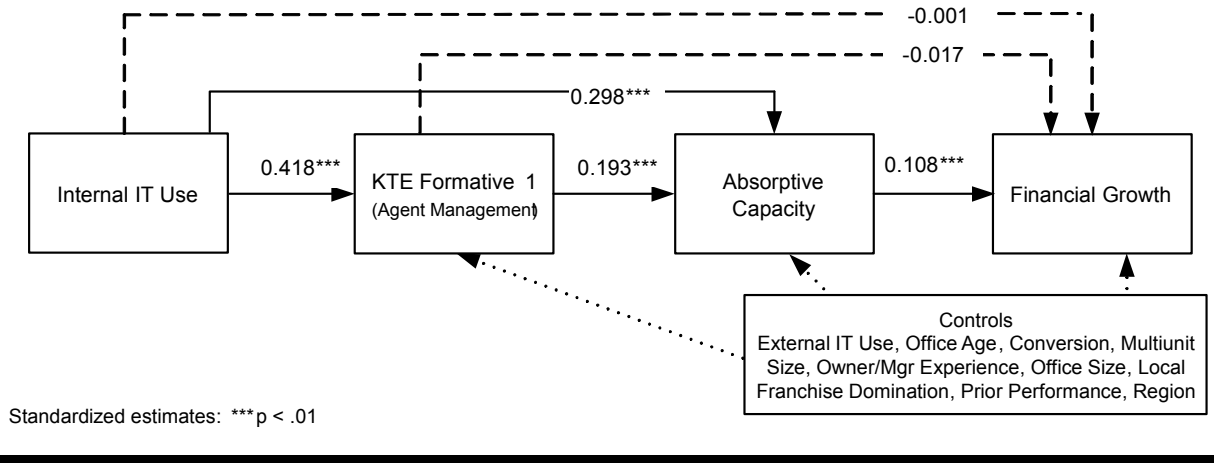

Figure B3. Results with Knowledge Transfer Effectiveness Formative 1

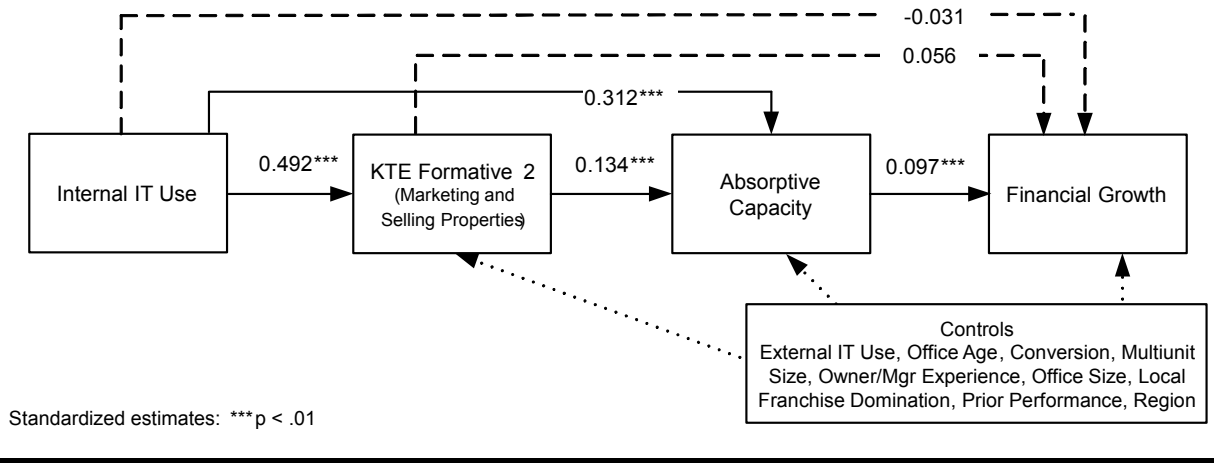

Figure B4. Results with Knowledge Transfer Effectiveness Formative 2

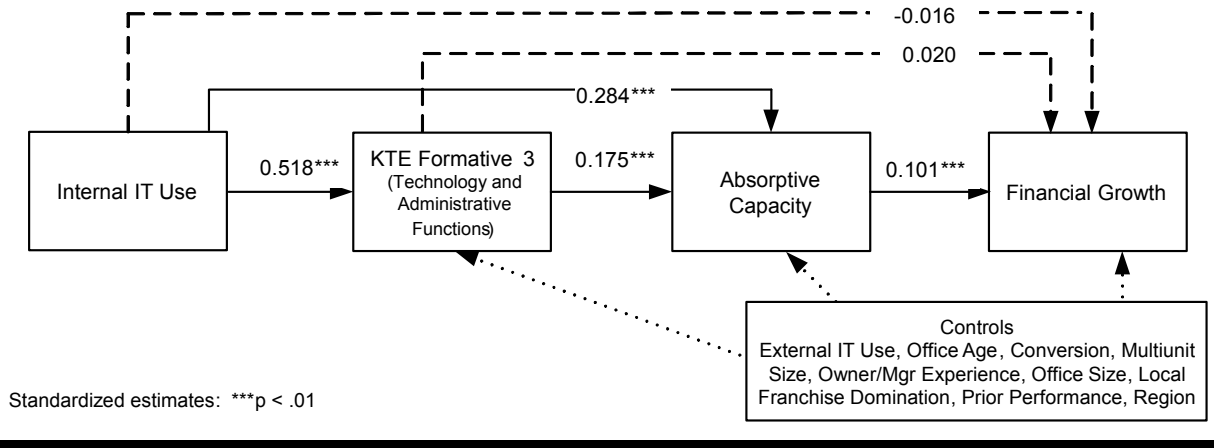

Figure B5. Results with Knowledge Transfer Effectiveness Formative 3