Validating a Design Thinking Strategy: Merging Design Thinking and Absorptive Capacity to Build a Dynamic Capability and Competitive Advantage

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Abstract. Design thinking in the management context has suffered from vague definition, gaps in literature, and lack of theoretical foundation. Research streams in absorptive capacity and dynamic capabilities have reached a point of convergence with respect to design thinking and absorption of external knowledge. As such, this study draws on both absorptive capacity and dynamic capability theory to provide theoretical foundation for the strategic consideration of design thinking in strategy, organization design, and organizational learning. In doing so, this study extends seminal absorptive capacity theory providing empirical evidence of design thinking as a dynamic capability to enhance absorptive capacity. Additionally, this study extends dynamic capabilities theory by confirming design thinking as a means of integration, learning, and reconfiguring knowledge to build competitive advantage. Therefore, this study merges existing research streams to empirically validate design thinking as a dynamic capability which must be strategically considered.

Keywords. Design Thinking; Absorptive Capacity; Dynamic Capability; Competitive Advantage.

1 Introduction

Strategic management of dynamic capabilities are required by executives and managers to sense and seize opportunities in markets, and the knowledge processes of integrating, earning, and configuring are core elements of dynamic capabilities (Teece & Pisano, 1994; Teece, Pisano, & Shuen, 1997; Teece D. J., 2007). Based on this view of the importance of knowledge, the knowledge based view proposes that acquisition and the management of knowledge, is the most important strategic based resource to gain a sustainable competitive advantage (De Carolis, 2002; Wiklund & Sheppard, 2003; Curado, 2006). Zahra and George (2002) first identified absorptive capacity as a dynamic capability by highlighting the need for organizations to continually invest in sustaining absorptive capacity to exploit new external knowledge. As such, previous research by Acklin (2013) and Llamas (2015) offered absorptive capacity as the theoretical foundation for design thinking as a means to acquire external knowledge, but cited the need for further research on how design management could be used as a dynamic capability for competitive advantage.

Design thinking has recently been proposed as a dynamic capability but scholars have identified that more studies are needed related to its impact in organizations due to vague definition, gaps in literature, and lack of theoretical foundation within the management research (Johansson-Skoldberg et al., 2013). Recent theoretical advances have linked design thinking as a dynamic capability to facilitate absorptive capacity of external knowledge which has led scholars to call for additional empirical research to understand how design thinking is a management process for absorptive capacity (Acklin, 2013; Llamas, 2015). The application of the two research streams of dynamic capabilities and absorptive capacity are substantially similar in their recognition that organizations must be customer focused and have the capability to acquire and commercialize knowledge external to the organization.

This qualitative multiple-case study describes and documents the perspectives of subject matter experts (SMEs) on how design thinking can support an organization's absorptive capacity and thus provides a dynamic capability and competitive advantage to acquire, assimilate, and apply external knowledge for value creation. This study advances the theoretical framework postulated by Llamas (2015) and Acklin (2015) that design thinking is a management process for absorptive capacity by acquiring, assimilating, and applying external knowledge (Llamas, 2015; Acklin, 2013). This theoretical framework supports the purpose of this study by providing a foundation on which to apply design thinking as a dynamic capability and competitive advantage by enhancing absorptive capacity of an organization (Llamas, 2015). The scholarly foundation for this framework is both the seminal work on absorptive capacity by Please confirm the year Cohen and Levinthal (1989) as well as the dynamic capabilities framework provided by Teece and Pisano (1994).

2 Previous Research

The concept of design thinking, from a scholarly point of view, has been developed in two different discourses of the design and managerial discourse (Johansson-Skolberg et al., 2013; Gasparini, 2015). Theoretical development of design thinking has primarily been accomplished

through the more scholarly design discourse, which, despite significant attention in academic and practitioner based literature, lacks theoretical foundation and is anecdotal (Johansson-Skolberg et al. 2013; Llamas, 2015). Within the design discourse, there are five clear sub-discourses that have theoretical foundation as well as an academic following (Johansson-Skoldberg et., 2013). The younger management discourse of design thinking, which has gained significant popularity since approximately 2003 with management practitioners (Johansson-Skoldberg et al., 2013), was developed primarily in the business media and practitioner testimonial .

2.1 Designer Thinking in the Design Discourse

Schon pragmatic-based philosopher and educator concerned with the study of organizational knowledge acquisition (Visser, 2010; Johansson-Skolberg et al., 2013). Schon (1983) seminal work on reflection in action described the practice, or methods, in which designers deal with ambiguity in problem solving (Kimbell, 2009; Kimbell, 2011) depending on the situation. Schon's hermeneutics view of design problem solving relied on the designers ability to create a solution and reflect upon that creation for continual improvement and re-creation (Johansson-Skoldberg et al., 2013) to revise understanding . Artistry and intuition are inherent in the ability of the designer to frame and reframe the problem space to offer possible solutions based on the individual solving the problem and context of the problem . This is relevant, as it inspired the post-rationalist, design methods movement , moving design-management theory from a problem solving cognitive concept toward a situational concept.

The design-methods movement (Buchanan, 1992; Buchanan & Margolin, 1995; Jones, 1992) highlighted situational aspects of design as designers reflect on the problem, solution and context which frames the problem space . Buchanan (1992) moved design from its cognitive roots to focus on patterns of reasoning employed by designers to approach ill defined, or wicked, problems noting innerrelationship of the analytic and synthetic phase where designers combine and balance requirements to produce a solution (Buchanan, 1992; Johansson-Skolberg et al., 2013). Cycling through contextual exercises to make sense of things (Wylant, 2010; Johansson-Skolberg et al., 2013) facillitates communication and interaction among participants identifying participant views and concerns. In Buchanan's view, integrative nature of design is relevant to developing the hypothesis and a set of acceptable solutions (Buchanan, 1992). Wylant (2010) noted this ability of designers to select the context, and recursively cycle through solutions, as an integral part of the designer's choice of a dominant context on which sense can be made of things (Johansson-Skolberg et al., 2013; Wylant, 2010). The highly dynamic, recursive and heuristic nature of problem solving which the designer continually reflects on a problem situation, interprets feedback, and reframes the problem relies on the context which the problem is approached .

Krippendorff (2006) identified stakeholders, and ultimately the user, as the focus of design thus moving away from technology centered design toward human-centered design . Krippendorff (2006) further proposed a new science of design whereby designers, due their unique capabilities and competencies, claim expertise in a second order understanding of how others use and understand artefacts. Second order understanding is dialogic and interactive by creating a new, more dynamic, form of knowledge which uncovers dynamic ways in which artifacts change user interpretation, functional parameters required, and influece selection of the appropriate design

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2.2 Design Thinking in the Managerial Discourse

Development of design thinking in the managerial discourse has taken a bottom-up approach highlighting design contributions to innovation prior to integrating management . Since the majority of content is practitioner based, to facilitate understanding, literature is dominated as a case-based approach referencing successes of design as a metaphorical and a managerial way to approach design. This bottom-up approach contributes to curiosity surrounding the concept and its contibutions to innovation (Johansson-Skoldberg et al.,2013). Consequently, popularity of design thinking as applied to innovation has been engineering-realated, based on statistical relationships and rational models of innovation. As such, development of design thinking in the management context was initially based on overly positive descriptions without contextualized meaning (Johansson-Skoldberg et al., 2013) and rich theory building indicative of scholarly work. Focus on the successes of design thinking related to practitioner accounts and innnovation has neglected theory from design research areas related to professional designers and how they think and work .

Hassi and Laakso (2011) identified the concepts of human-centered approach, visualizing, collaboration, thinking by doing, and divergent and convergent work styles. Of these concepts, the human-centered approach is highlighted in much of the literature on design thinking and usually involves empathy for the subjects (Brown T. , 2008; Clark & Smith, 2008; Dunne & Martin, 2006; Holloway, 2009; Junginger, 2007) through a putting people first approach (Brown T. , 2008; Porcini, 2009; Ward, Runcie, & Morris , 2009; Porcini, 2009) which uses integrative thinking to identify the most important aspects of problems and creating a compromised solution from competing possible solutions (Brown T. , 2008; Fraser, 2009). Divergent and convergent approaches as well as combinations of the two, is a practice of creating, or visualizing, multiple possibilities without assuming that these possibilities are the best (Boland & Collopy, 2004) but are instead paths toward a solution . Visualizing is a way to make sense of things in an intangible manner other than words or symbols in order to communicate ideas to be discussed as the process moves toward convergence and mutual understanding. Thinking by doing is an iterative practice which uses prototypes and reflection in action to stimulate thinking and explore multiple ideas (Boland & Collopy, 2004; Lockwood, 2009) by turning the visualized concepts into tangible representations to stimulate further reflection and exploring (Boland & Collopy, 2004).

Boland and Collopy (2004) expanded on Simon (1969) theory of design as a method of changing existing states into more preferred states. Simon (1977) proposed a new science of management decision making which, due to management's responsibility to change existing situations into preferred situations, should be treated similar to applied sciences of engineers and architects. Previously, design was viewed as a noun describing a completed process rather than as a verb indicative of an ongoing process or management action (Boland & Collopy, 2004; Boland & Collopy, 2007). This distinction in the action, as a verb, of changing an existing situation into a preferred, is a key aspect of design making which makes organizational leaders an active part of the process rather than passive responders to presentations. Boland & Collopy (2007) state that this verbal form of design, where the management are active participants, is a critical skill

for successful organizational leaders and the design attitude is an important cognitive mode for practising managers which should be addressed by management education and practice.

From an organizational perspective, design thinking used as a method to approach organizational problem solving as well as a skill for managers, developed by Dunne and Martin (2006) noted cognitive, affective, and interpersonal skills designers have developed. Hassi and Laakso (2011) note methods designers have developed as practices, thinking styles, and mentalities which underscore the close relationship of the organisational practices sub-discourse with the practitioner-focused sub discourse of design as a way of working with innovation and design. As such, Dunne & Martin (2006) notes the need for management education to build the skills necessary for a deeper understanding of the end user and end user experience using observational research techniques to uncover needs that are not easily articulated (Leonard & Rayport, 1997). Building on Argyris and Schon (1978), Martin references the need for management education to develop skills of inquiry within MBA students which note the importance and usefulness of others to understand the value of curiosity and inquiry in problem solving . By developing design thinking separately from the practioner-based discourse, which focuses on design and innovation, Martin removes the concept of designerly ways of working and focuses on the mental processes used by designers which can be adopted by everyone who follows the process . By decoupling design thinking from design, innovation, and new product development, Martin opened up the design-thinking concept as a process to use in a variety of disciplines and industries which in turn validates the concept as a skill needed by practising managers. As a result, design thinking has grown within the management community, due to Martin's wide reach as a speaker and author, to influence work in a wide range of disciplines, including strategy and organizational change and development (Johansson-Skolberg et al., 2013; Sato, Lucente, & Meyer, 2010).

Despite the lack of empirical evidence and firm theoretical base within the management context, design thinking has increasingly been applied by organizations (Liedtka, King, & Bennett, 2013; McCreary, 2003) in a variety of industrial contexts . The relatively small amount of empirical research that exists on design thinking in organizations has evolved from a performative perspective focused on the performance of the design-thinking methodology and accompanying tools (Seidel & Fixson, 2013; Carlgren, 2013). Additionally, empirical research has been conducted in experimental settings involving students however the results have been mixed . The lack of substantive empirical research has led to reliance on practitioner based accounts of design thinking resulting in overly positive views of the value of design thinking. As a result of overly positive practitioner accounts, academic researchers have been apprehensive to approach the concept . Accordingly, prior scholarly research had called for additional studies to determine the success of design management absorption as a dynamic capability to build a competitive advantage and unless research builds on the scholarly aspects of the design discourse the concept of design thinking in the management discourse will likely die (Johansson-Skoldberg, et al., 2013).

3 Absorptive Capacity

Organizational level absorptive capacity was introduced by economists Cohen and Levinthal (1989) seminal work explaining why organizations invest in research and development. Absorp-

tive capacity conceptualized an organization's ability to exploit external knowledge through a sequential process to recognize the value of external knowledge, assimilate this new knowledge through exploratory learning, and apply assimilated knowledge to create new knowledge and value . Early research into absorptive capacity focused on learning and innovation with respect to the performance of the firm (Volberda et al., 2010) and the firm's ability to acquire, assimilate, and apply external knowledge . Much early empirical research focused on an innovation based learning process evident in research and development projects and firms.

Todorova and Durisin (2007) extended seminal work of Cohen & Levinthal (1989), subsequent research by Zahra and George (2002) and Lane (2006) as well as drawing on learning theory, to propose the acquisition of knowledge by an organization utilizes internally existing organizational knowledge to recognize the potential value of external knowledge. With resepect to assimilation of knowledge, Todorova and Durisin (2007) note that organizational assimilation is contingent on the social integration process of transformation as proposed by Zahra and George (2002), and Todorova and Durisin, 2007. Likewise, the application phase of the model highlights the dynamic capability perspective of absorptive capacity previously overlooked by Zahra and George (2002) as well as this dynamic nature of feedback loops use during application.

The knowledge based view of absorptive capacity is an outgrowth of the resource-based view of the firm proposed by Barney (1986) which highlights the impact of partner contributions and outward knowledge transfer to absorptive capacity .The knowledge-based view of absorptive capacity stresses the importance of developing knowledge, promoting organizational learning, enhancing open innovation, managing alliances, creating strategic variety, and impacting financial performance . Research by Lichtenthaler (2016) noted both benefits and drawbacks of absorptive capacity along with tendency of prior research to only focus on benefits. Volberda et al. (2010) highlights the impact other factors such as a dynamic environment have on the level of absorptive capacity.

According to Barney (1991), firm resources are all capabilities, processes, attributes, assets, information, and knowledge controlled by a firm, which can be strategically manipulated to gain competitive advantage.

Grant (1996) confirms the importance of knowledge as the most strategically important resources of the firm and Kogut and Zander (1992) maintain knowledge is the main determinant of competitive advantage. Accordingly, the strategic importance of knowledge strongly reinforces the relevance of absorptive capacity as a key resource in developing and increasing a firm's knowledge (Volberda et al., 2010). Building on the concept of dynamic capability proposed by Barney (1991), Zahra and George (2002) furthered the theoretical base of absorptive capacity as a dynamic capability related to the management and successful exploitation of knowledge. Zahra and George (2002) recognized the need for organizations to continually invest in sustaining absorptive capacity to exploit new information which Todorova and Durisin (2007) built on this point stressing additional dynamic factors of social and organizational factors. Zahra and George (2002) was important from the organizational standpoint as it recognized organizational absorptive capacity does not reside in any one individual but resides in the accumulation of all individual capabilities (Cohen & Levinthal, 1990; Volberda et al., 2010).

4 Dynamic Capabilities, Competitive Advantage, and the Business Model

Chandler's (1962) seminal work on strategy and structure is credited with first identifying a firm's strategy for growth as determining the strategic management of an organizations valuable resource . Penrose (1959) in her theory of the growth of the firm first viewed the firm as a competitive bundle of resources (Hoskisson et al., 1999). Building on Penrose (1959), the resource based view gained widespread attention in a variety of theoretical streams in the 1980's resulting in Barney (1991), which identified the resource traits necessary for sustainable competitive advantage as value, rareness, inimitability, and substitutability.

The resource-based view postulated by Barney (1991), created a concrete base on which to build a variety of research streams related to the resource-based view of the firm (Hoskisson, et al., 1999). Porter (1991) proposed the dynamic theory of strategy noting the most important of all resources is the ability to learn and adapt to the changing environment. Subsequently, to overcome the limitations of the resource-based view and building on Porter (1991), Teece and Pisano (1994) proposed the dynamic capability framework to address the changing global business environment which requires organizations to respond quickly to the market, engage in rapid innovation, and adapt to future competition and markets. To compete in this changing environment, organizations must develop capabilities to adapt, integrate and reconfigure both internal and external competencies (Ambrosini & Bowman, 2009; Teece & Pisano, 1994). Accordingly, the dynamic capability framework proposes that competitive advantage is achieved in the global, fast moving, markets by an organization's ability to sense, seize, and transform opportunities by creating, renewing, or altering the resource mixes (Teece, Pisano, & Shuen, 1997; Teece D. J., 2007).

The dynamic capabilities framework is a strategic view descending from Schumpteter (1934) theory of economic development. Teece and Pisano (1994) propose managerial and organization competencies of integrating, learning, and reconfiguring are three key components to dynamic capability and competitive advantage. Similarly, Ambrosini (2003) identified four organizational and managerial dynamic capability processes; learning, creative integration, reconfiguration, and leveraging. The dynamic capability of knowledge exploitation can be leveraged into a competitive advantage when customer-centric, value creating, business models are developed which focus on user needs and delivery (Chesbrough & Rosenbloom, 2002; Mansfield & Fourie, 2004). Of the resources and assets of the firm, knowledge related assets are most valuable due to their ability to be coordinated and integrated in a manner, which creates value but cannot be replicated in the market . Therefore, strategic management of dynamic capabilities is required by executives and managers to sense and seize opportunities by allocating, reallocating, combining, or recombining the resources and assets of the organization to provide customer solutions . Accordingly, De Carolis (2002) offers knowledge-based view of the firm as an extension of the resource based view which considers knowledge as the most important strategic based resource of the firm . Wiklund and Sheppard (2003) notes if a resource is difficult to formalize, articulate, and transfer to other organizations, and the resource is also organized and valuable, then it meets the threshold of rare and inimitateable, thus providing a sustainable competitive advantage.

5 Research Method

The problem this study addresses are gaps in literature on how design thinking can support an organization's absorptive capacity and competitive advantage to acquire, assimilate, and apply external knowledge for value creation (Llamas, 2015). Empirical studies have been conducted and point to absorptive capacity as a key factor for multiple outcomes (Jansen, Van Den Bosch, & Volberda, 2005; Schildt, Keil, & Maula, 2012), however, results are inconsistent and question the assumptions that firms perform better because of absorptive capacity. While results are inconclusive as to the extent absorptive capacity contributes to firm performance, research has shown that as firms perform higher, they invest more in absorptive capacity . The inconsistencies in empirical results, along with base assumptions on which prior research was based, has caused the need for further research to understand the trade-offs and conflicting contingencies that impact the functioning of absorptive capacity at the firm level .The purpose of this qualitative multiple-case study is to describe and document the perspectives of SMEs on how design thinking can support an organization's absorptive capacity and competitive advantage to acquire, assimilate, and apply external knowledge for an organizations value creation.

This research study utilized a qualitative, multiple-case study to describe key insights of six SMEs in the field of design thinking to study the application of design thinking in various settings to determine how design thinking is used to facilitate absorptive capacity. According to Yin (2014), a unit of analysis is the phenomenon or population that must be defined, therefore, within the context of this research, the term *case* means a single person, a SME, and how SMEs describe the application of design thinking to acquire, assimilate, and apply external knowledge. Therefore, for the purpose of this study the unit of analysis is the case and how SMEs view design thinking promotes absorptive capacity to acquire, assimilate, and apply external knowledge (Acklin, 2013; Llamas, 2015) to build a dynamic capability and competitive advantage.

The resulting six-design thinking SMEs are all recognized design-thinking practitioners within the design-thinking community and skilled in the application of design thinking in various organizational contexts. A wide range of organizational contexts was selected for this research study in order to provide a wide range of perspectives in order to view the application of design thinking in multiple contexts. Participants who were deemed to have little experience, knowledge, or lacked breadth of application of the concept were disqualified from the research study. Six participants was determined to be an appropriate amount for this exploratory research where an in depth, open ended, interview process was used to engage a small number of samples and determine replication logic across the multiple case research study design .

5.1 Data Collection, Processing, and Analysis

To facilitate rich exploration, and description, of the perspectives of SMEs this research study chose semi-structured interviews to increase understanding the phenomenon or phenomena from the participant's point of view . The six participants in this research study were taken through a semi-structured interview process, which consisted of a series of open ended questions to describe how SMEs view the ability of design thinking to facilitate absorptive capacity and competitive advantage to acquire, assimilate, and apply external information for organizational value creation

(Acklin, 2013; Llamas, 2015). Replication of results by conducted cross-case synthesis was used to indicate the extent to which the replication logic was either a literal replication whereby the outcome was predicted or a theoretical replication based on a prediction of contrasting data . The research data collected was triangulated to provide cross-data validity checks of the data collected from the multiple cases to achieve more accurate and valid estimates of results (Merriam, 2009; Stake, 1995).

To gain better understanding of the research outcome as well as improve the quality of the investigation and study, triangulation was accomplished by both theory and investigator triangulation. Investigator triangulation involves using multiple investigators to analyze the same set of data which, in the case of this research, also supports theoretical triangulation by using multiple perspectives to interpret a single set of data. In this research study, investigators included the researcher, and two independent evaluators outside of the field of design thinking and management in the fields of Organizational Behavior and Finance and Statistics. Each evaluator read the entire transcript, reviewed the data analysis process and results, and validated the researchers' interpretations of transcript data. Therefore, investigator triangulation was accomplished via two independent investigators who also provided theoretical triangulation by offering multiple perspectives outside of the field of study .

6 Empirical Results

This study confirms the ability of design thinking to support an organizations absorptive capacity to provide both a dynamic capability and competitive advantage relevant to absorption capacity of external knowledge. The study viewed the flow of external information through the lens of absorptive capacity as a means to explore the potential dynamic and competitive nature of design thinking. As such, this study's central research questions were concerned with acquisition, assimilation, and application of knowledge outlined in the economic model of absorptive capacity. The study's findings confirm design thinking is a dynamic capability, which provides a competitive advantage to facilitate absorptive capacity of external knowledge and as such, three significant themes emerged throughout this multiple-case study of SMEs.

The first theme evidenced in this study is the ability of design thinking to dynamically integrate the external into an internal process for the purpose of learning as highly dynamic requiring management interaction. The design-thinking process builds deep understanding of end user and end user experiences through observational research techniques uncovering needs not easily articulated (Leonard & Rayport, 1997). Llamas (2015) referred to design thinking as a project based method to facillitate collaboration between new product design, engineering, and end users to create effective solutions to meet social needs. In Buchanan's view, the very act of assessing and formulating the problem is part of the problem and allows simultaneious development of analytic and synthetic phases in which designers combine and balance requirements to produce a solution (Buchanan, 1992; Johansson-Skoldberg et al., 2013) According to Teece et al. (1997), dynamic capabilities are defined as the three processes of integrating, learning, and configuring. Ambrosini (2003) added to this dynamic view stating, the four organizational and managerial processes of learning, creative integration, reconfiguration, and leveraging are a dynamic capability. Executives and managers are required to sense and seize opportunities by

allocating, reallocating, combining, or recombining the resources and assets of the organization to provide customer solutions and if a resource is difficult to formalize, articulate, and transfer to other organizations then it meets the threshold of rare and inimitateable, thus providing a sustainable competitive advantage. As such, design thinking spans several of these capabilities as it integrates customers or users into the learning and configuring process for the purpose of leveraging insights to create value and therefore must be considered a dynamic capability.

The second theme identified participant views of the contingent nature of competitive advantage in acquiring knowledge and difficulty in maintaining sustainability. Participant seemed to focus on the tendency of design thinking overly focus on tools to engage and acquire knowledge, which most participants viewed as imitable. SME's indicated contingency exists in the degree of competitive advantage and sustainability relative to a host of organizational factors. Additionally, participants noted the contingent nature of speed and efficiency in application of knowledge as a factors impacting competitive advantage. The immediacy assumption of prior absorptive capacity research, assumes that knowledge acquired must financially materialize immediately and does not allow for time lags. Furthermore, Leonard and Barton (1995) noted that effective use of knowledge is an important factor in value creation, which is impacted by a lack of understanding of the sciences involved in the newly acquired knowledge as well as the misunderstanding by management of the capabilities of the firm to apply external knowledge . Teece (2007) described the business model as a reflection of management perspective about what customers want, and recognizes the acquisition and the management of knowledge as dynamic capabilities that provide sustainable competitive advantage (Wiklund & Sheppard, 2003; Curado, 2006). Furthermore, Teece (2007), also highlights the ability to take advantage of opportunity and remain competitive through management of the resources of a business enterprise's tangible and intangible assets as dynamic capabilities. Teece (2007) goes on to indicate the business model as a reflection of management perspective about what customers want and how the organization can meet those needs and get compensated. Therefore, design thinking is a dynamic capability to build competitive advantage, however, contingency is related to organizational factors which promote aborptive capacity, speed and efficient application of knowledge.

The third theme identified competitive advantage of design thinking is derived from a highly dynamic interrelationship between assimilation and application of knowledge in design-thinking. This dynamic interrelationship is based on integration of the customer or user into the prototyping and iteration process. Integration of the external source of knowledge into prototyping is boundary spanning as assimilation and application of knowledge happens simultaneously. The process gets more dynamic as prototypes go through the iterative process whereby prototype improvements are made until an acceptable solution is achieved. Hassi and Laakso (2011) referred to this as an iterative practice which uses prototypes and reflection in action to stimulate thinking and explore multiple ideas (Boland & Collopy, 2004; Lockwood, 2009) by turning visualized concepts into tangible representations to stimulate reflection and exploring (Boland & Collopy, 2004). Design thinking is explorative and experimental, tolerant of ambiguity, oriented toward the future, and optimistic involving a wide range of stakeholders as an integral part of design thinking (Brown T. , 2008; Brown T. , 2009; Clark & Smith, 2008; Dunne & Martin, 2006;Holloway, 2009; Lockwood, 2010). Boundary spanning activity in absorptive capacity research outlined by Todorova and Durisin (2007) draws on learning theory to propose the acquisition of knowledge by an organization utilizes internally existing organizational knowledge

to recognize the potential value of external knowledge and subsequently, the assimilation phase is contingent on a social integration process of transformation as proposed by Zahra and George (2002). This is also supported from the dynamic capability perspective, which highlights the dynamic nature through the contribution and value of feedback loops . Considering this dynamic nature, Llamas (2015) referred to design thinking as collaboration between new product design, engineering, and end users to create effective solutions.

7 Theoretical Contributions

This study contributes to previous research by Acklin (2013) and Llamas (2015) that design thinking is a management process for absorptive capacity by acquiring, assimilating, and applying external knowledge. The scholarly foundation is seminal work on absorptive capacity by Cohen and Levinthal (1989) that proposes firms benefit from investing in absorptive capacity to preempt environmental changes by taking a knowledge based view of absorptive capacity to promote organizational learning, enhance open innovation, manage alliances, create strategic variety, and impact financial performance . This was later extended by Lane and Lubatkin (1998) noting organizations must focus on understanding their internal knowledge and the process which it acquires new knowledge, converts that knowledge to capabilities, and the ability of those capabilities to meet demands of the environment. Barney (1991), and Zahra and George (2002) extended the theoretical base of absorptive capacity as a dynamic capability related to the management and successful exploitation of knowledge. As such, this study is a further extension of the seminal work of Cohen and Levinthal (1989) absorptive capacity theory by providing empirical evidence in supporting design thinking as a dynamic capability and competitive advantage to enhance absorptive capacity of organizations (Llamas, 2015).

This study also extends dynamic capabilities theory as an extension of Schumpteter (1934) theory of economic development. The dynamic capabilities framework proposes managerial and organization competencies of integrating, learning, and reconfiguring are key components to dynamic capability and competitive advantage. Consequently, executives and managers are required to sense and seize opportunities by allocating, reallocating, combining, or recombining the resources and assets of the organization to provide customer solutions and if a resource is difficult to formalize, articulate, and transfer to other organizations then it meets the threshold of rare and inimitateable, thus providing a sustainable competitive advantage. As an extension to this theory, Teece (2007) extended the dynamic capabilities theoretical framework to include the business model which must have capabilities to analyze multiple alternatives, understand user needs and deliver what users want . As such, this study provides empirical support for design thinking as a dynamic capability to provide a competitive advantage due to its understanding of the customer which facilitates learning and customer solutions; however, this research recognizes the need for further empirical investigation relative to managerial interaction in a variety of contexts.

8 Conclusion and Recommendations for Future Research

Organizational learning literature highlights the needs for organizations to take a system thinking approach to building a framework to promote absorptive capacity to adapt to the dynamic and increasingly complex nature of external knowledge, this is particularly relevant in the new digital economy. This study has provided empirical evidence of design thinking as a dynamic capability to enhance absorptive capacity to acquire, assimilate, and apply external knowledge (Acklin, 2013; Llamas, 2015) and provides a foundation on which to strategically consider design thinking (Llamas, 2015). The knowledge uncovered in study empirically extends previous research by Acklin (2013) and Llamas (2015) by further validating design thinking as a strategy and organizational design consideration thus bridging theoretical gaps and providing a basis for further study of the effects of design thinking in a variety of managerial contexts. Future empirical research is needed to extend the findings of this study with respect to; dynamic integration of the external into the internal, dynamic interrelationship between assimilation and application, and contingent factors impacting competitive advantage and sustainability. Furthermore, future research should seek to investigate these findings in a variety of strategic, organizational, and managerial contexts.

According to Teece (2007), a good business model must have capabilities to analyze multiple alternatives, understand user needs and business models should be based on customer focused value creation (Chesbrough & Rosenbloom, 2002; Mansfield & Fourie, 2004). While this study provides validation of design thinking as a strategic in nature, future researchers should explore the organizational effects of structure, people, and culture on degree of competitive advantage realized by design thinking in a variety of contexts through empirical based qualitative research. Similar to Carlgren, Rauth, & Elmquist 2016, this study also confirms the need for further empirical research to understand how design thinking is used in a variety of organizational settings and contexts in order to gain a deeper understanding of the impact of these factors on the absorptive capability, dynamic nature, and related competitive advantage of design thinking to validate its strategic and competitive importance. In addition to organizational settings, future research should consider more widespread adoption of design thinking management training in higher education as well as practical settings. Therefore, future research should focus on establishing a design thinking management body of knowledge for the purpose of both higher education development as well as as organizational and practitioner training.

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Biographies

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