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Elevating Design
Building Design as a Dynamic Capability

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A thesis submitted to the School of Design
from the College of Design, Architecture, Art, and Planning
at the University of Cincinnati for the degree of Master of Design

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This thesis focuses on the interaction between design and business, exploring its impact on the success of organizations through two case studies of design managers, Dan Harden, Chief Executive Officer for Whipsaw Inc and Sam Lucente, Global Vice President of Design for Hewlett-Packard. Through an analysis of organizational strategy and design, this thesis proposes a theoretical model that identifies how design becomes a dynamic capability for any organization when its promotion and support shifts from a person to a function. Finally, based on this model, this thesis analyzes the effectiveness of design thinking in supporting design as a dynamic capability and offers conclusions for the elevation of a design function in support of a sustained competitive advantage in organizations.
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To my family, friends, faculty, and mentors—you are my inspiration.
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INTRODUCTION

To understand design’s role in creating competitive advantage, we need to comprehend how design and business practices interact within organizations. Miscommunication between fields often results in explanations of practice through simplified processes that do not deeply reflect the actions of their practitioners. Designers anticipate something formulaic from their business partners, who in return expect high fidelity, market ready concepts from their design partners. These perceptual gaps often get in the way of the development of reflective business and design partners who are able to collaborate effectively, acknowledging each other’s value and the dynamic of a never finished process for creative work (Vogel & Cagan, 2002).

This thesis focuses on this interaction between design and business, exploring its impact on the success of organizations through two case studies of design managers, Dan Harden, Chief Executive Officer for Whipsaw Inc and Sam Lucente, Global Vice President of Design for Hewlett-Packard. Through an analysis of organizational strategy and design, this thesis proposes a theoretical model that identifies how design becomes a dynamic capability for any organization when its promotion and support shifts from a person to a function. Finally, based on this model, this thesis analyzes the effectiveness of design thinking in supporting design as a dynamic capability and offers conclusions for the elevation of a design function in support of a sustained competitive advantage in organizations.
CASE STUDIES

DAN HARDEN

Dan Harden is president, chief executive officer, and chief designer of Whipsaw, a highly acclaimed industrial design and product development consultancy located in San Jose, California. Dan is the embodiment of a design manager, who after founding Whipsaw in 1999 has won over 125 major design awards and been granted over 150 design and utility patents. Whipsaw was recognized as one of FastCompany’s top design firms in 2008, which is a major accomplishment for a young 25-person firm (Tischler, 2009).

Dan began his life as a designer growing up in Cincinnati, Ohio, learning art at Cincinnati’s premier high school, Walnut Hills High School, and studying industrial design at the University of Cincinnati’s top-ranked college of Design, Architecture, and Art (DAA). Before graduating in 1982, Dan had the opportunity to intern with Henry Dreyfuss Associates, George Nelson Associates, and Richardson Smith (Fitch) through the university’s co-operative education program (Harden, 2011). Learning industrial design during a time of economic uncertainty and interning under some of the most prolific designers of the 20th century, Dan gained a unique perspective on the relationship between design and its users, as well as design and market performance (Harden, 2009).

In his blog post from September 8, 2009 on FastCompany.com’s blog, Harden shares a transformational experience in his professional career when he worked under George Nelson. “He was a towering design hero to me, having defined much of what I knew as “modern” in design.” As an intern with George Nelson Associates, Dan was eager to learn, but found it challenging to connect directly with Mr. Nelson. “George spent most of his time in a closed office...he was intimidating and unreachable...I noticed that every afternoon at 4 o’clock sharp [he] would disappear for thirty minutes.” Dan discovered that he would go to a bathroom, light a cigarette and drink coffee by himself. One day, Dan went to the restroom at 4 o’clock sharp, and carefully initiated a conversation with Mr. Nelson, who very eloquently talked to Dan about “clients, society, and people, and how they don’t understand design.” These bathroom lectures became daily conversations while Dan was interning with George Nelson Associates—introducing
him to ideas of beauty, art, philosophy, and science, but always reverting to the “hard-core sting of ugly realities.” Dan continued, “George shocked [me] into a new awareness—he made me think, made me see, and made me mad” (Harden, 2009).

One can see the impact of George Nelson on Dan’s approach to design. As philosophical and passionate as Mr. Nelson was to Dan; he has now assumed that role within Whipsaw as its leader, creative visionary and strategic decision maker. Dan is a premier example of a designer and design manager whose elevation of design as a dynamic capability has launched his firm to the top. At an Industrial Designer’s Society of America (IDSA) District Conference in Cincinnati, OH April 2011, Dan advised, that “you have to be just as creative in how you run your business as in how you design.” He continued, “It is like a game of chess—it is strategic…be smart about it, don’t give up.” Dan stressed the importance of business development and good press relations, and how through being organized one can be more persuasive, because your work and partnerships will come from a sincere place. Dan attributes much of his success to his ability to articulate the value of design and the time he spends acting strategically in creating new partnerships—“You don’t win every time, but you must consistently” (Harden, 2011).

Dan looks for the most challenging problems businesses are faced with and finds ways that design plays a role is their solution. He believes that even the most challenging economic conditions serve as a catalyst for change. “Constraints stretch flabby design muscles—the results are often surprisingly buff.” Dan’s works with companies that need CPR (Creativity, Passion, and Reason), and begins by taking a comprehensive evaluation of their clients’ customers’ needs: “it takes lots of user-research, testing, open-mindedness, and patience to nail a good universal design” (Harden, 2009). Often working with technology firms, Whipsaw has expertise at developing simple, intuitive solutions that soften technology and allow human interaction (Patton, 2005).

Dan’s confidence and experience allow him to maneuver obstacles and create new partnerships most firms would struggle to duplicate. One example is Dan’s design and development of the Yubo lunchbox for Kinsco. Whipsaw was approached by Cyndi and Paul Pedrazzi to design the ultimate children’s lunchbox, and instead of negotiating for the typical design fees, Dan noticed an opportunity and understood the value of their design. The industrial design, material knowledge and engineering capabilities offered by Whipsaw represented the entire value of the product. Without
a great design and incredible manufacturing knowledge, the Pedrazzis would not have a competitive advantage or significant value in a lunchbox offering. Dan negotiated not only a design fee, but also partial ownership of the new company so Whipsaw would succeed along with their design. Design became a venture capitalist investment on behalf of Whipsaw (Harden, 2011).

Over the last 31 years, Dan has moved from simply a brave young designer with the courage to speak to a design master to a master himself. His designs have brought him recognition, but his fearless decision making and consideration for strategy are what make him successful. I am skeptical whether Dan, as a design manager, would have been able to make the same decisions or create the same partnerships without both his mastery of design and business. In closing his IDSA speech, Dan wanted to make the following clear, “thinking is more interesting than knowing, but less interesting than seeing... every experience benefits from craft, because it adds authenticity, design is hand, head and heart together.” Dan finds truth through design, believes in process, focuses on his user, and through craft creates experiences—the content of life (Harden, 2011).
Sam Lucente, the former Vice President of Design at Hewlett-Packard Company (HP), transformed the way the global leader of printers, computers, and IT services strategically integrated design. As the first IT company to report revenues exceeding $100 billion, Sam’s contributions were significant to HP’s success (Brand Strategy, 2007). Sam’s leadership and strategy has been praised by the Design Management Institute, FastCompany, and the Wall Street Journal and his designs are part of the permanent collection at the New York moma, sfmoma, and the Smithsonian National Design Museum. In 2007, Sam was recognized by FastCompany as one of their global Masters of Design (Breen, 2007).

Sam, like Dan Harden was born in Southwest Ohio, near Dayton, and attended the University of Cincinnati’s College of Design, Architecture, and Art (DAA) graduating in 1981 from industrial design. While at DAA, Sam had the opportunity to intern through the co-operative education program including working at International Business Machines Corporation (IBM) with whom he continued working full-time after graduation. While at IBM, Sam worked under the corporate-wide design program established by Eliot Noyes in 1956. This was the first and one of the most influential corporate design programs created in the 20th century, and Sam credits its direct influence on his career as a designer (Lucente, 2011).

As a student and professional, Sam greatly respected Eliot Noyes’ work including his design for the IBM Selectric Typewriter in 1961. “His design really broke away from IBM’s standards—he basically said, “screw the standards”—and yet he beautifully interpreted IBM’s design attitude.” Sam sees this as a model for leading design in the 21st century, where corporations set a design ethos through its guidelines; however structure their teams to develop “beautiful, consumer-based objects that relate to their target market in a way that I could never understand” (Breen, 2007).

After working for IBM, Sam joined Netscape in 1996 where he learned innovative new ways of managing design. From IBM’s corner offices and corporate design standards, to cubicles and entrepreneurial spirit, Netscape celebrated its equality and ingenuity rather than its hierarchy and tradition of innovation. Netscape’s design process was systematic and replicable—through trial and tribulation great design could
be accomplished. Sam mentions how this model was very user-centric in its approach, “you build something, you test it, you put it in beta, [and] you refine it.” At Netscape Sam learned how to manage the design of software through a collaborative approach and trust the user as part of the design process (Breen, 2007).

These experiences from IBM, Netscape, and independently as a consultant, shaped Sam’s strategic approach to aligning design as a dynamic capability for H-P. Sam notoriously setup a meeting with a senior H-P executive in late 2002 because he “saw tremendous opportunity to help reinvent the company [after acquiring Compaq]” (Tam, 2004). In January 2003, Sam was hired as the company’s director of brand design and experience. Immediately Sam began unraveling the complexity of design at H-P, he found systems of products that looked like they were produced by different companies and brochures and information booklets that had little to no consistency in brand language. H-P was using a portfolio of different design consultants with a lack of communication across product lines, which produced inconsistently and consequently confused consumers. In 2003, Mr. Lucente stated that “we’re building on H-P’s engineering heritage to invent a new customer experience” (Tam, 2004). By linking his efforts with the core competencies of the company, Sam was elevating the importance of his work to develop an ethos and consistent brand of H-P products.

During a now famous meeting between new H-P CEO Mark Hurd and Sam Lucente in the spring of 2005, Mr. Hurd opened the meeting with “Why am I meeting with you guys?” Hurd was in the midst of restructuring the entire company in order to make operational efficiency the cornerstone of its competitive strategy. Sam felt that design played a role as a dynamic capability in this model and wanted to persuade Mark Hurd to support this approach (Breen, 2007).

“The ponytailed Sam Lucente, who’d become H-P’s first-ever vice president of design two years earlier, was in the hot seat. He flashed a slide that showed dozens of H-P logos, each created by a different team within the company. The next slide was a single logo, crafted by his corporate design crew, that could be used everywhere. Lucente predicted that when 500 million of the new “jewel” logos were shipped, the company would have saved roughly $50 million in development and manufacturing costs” (Breen, 2007).
Sam connected design objectives with organizational strategy, aligning his efforts with the priorities of the firm. Mark Hurd was impressed and supported Sam’s plans for a corporate design initiative that included aligning software, product controls, packaging, enterprise systems, and parts of the supply chain (Spooner, 2006). Over the next 5 years, Sam was able to introduce new ideas from prototypes on his desk to marketplace success, and save the company tens of millions of dollars in additional savings from his strategic design efforts (Lucente, 2011).

With Sam Lucente’s leadership, design became a dynamic capability in the organization’s strategy. H-P used design as a strategic business tool which gave the company’s products and services a look and feel that is specific to their brand. It is now part of a long-term goal to transform their computers and printers from low-margin commodities to stylish desirable products (Brand Strategy, 2007).

Sam succeeded at H-P because he knew instinctually how to navigate bureaucracies. He quietly figured out how to communicate the value of design in business terms and successfully positioned design as a key dynamic capability in a $100 billion company. In the next section I explain the concepts of design and dynamic capabilities, introducing their relationship. I then investigate how organizations can build support and sustain a competitive advantage in the context of these case studies.
DESIGN AS A DYNAMIC CAPABILITY

DESIGN

Design is challenging to define—yet many claim it as a descriptor. Functioning as both a noun and a verb, design is directly linked to the product development process. Pointing to its multiple uses, John Heskett states: “design is to design a design to produce a design” (Heskett, 2003). The complexity of its usage is also represented in how design is defined by the diversity of individuals who claim it as part of their field. Looking at scholars from Carnegie Mellon University alone, one can see the diversity of thought concerning design. Herbert Simon, a cognitive psychologist and political scientist, known for his work on artificial intelligence explains, “everyone designs who devises courses of action aimed at changing existing situations into preferred ones” (Simon, 1996). Harold Nelson, architect, describes design as “the ability to imagine that which does not yet exist, to make it appear concrete form as a new, purposeful addition to the real world” (Nelson & Stolterman, 2003). Finally Richard Buchanan, formerly the head of the school of design at Carnegie Mellon describes design as “the human power of conceiving, planning, and making products that serve human beings in the accomplishment of their individual and collective purposes” (Buchanan, 2001). Whether simple or complex, design is ultimately user-centered; it is an approach to solving problems that embraces the unknown with the known. Design fully utilizes one’s abilities, often through collaboration with others, to discover an unexpected solution that improves an experience.

There are many ways that we solve problems, some benefit from a creative approach like design, and others require an evidenced based approach that delivers empirically proven solutions. Donald Schön in The Reflective Practitioner, identifies how scientific and analytical thinking has dominated our society, producing a movement he calls Technical Rationality. Utilizing this method, we have attempted to solve problems that would improve the wellbeing of society; however we have failed to consistently create wealth, improve human life, accomplish national goals, or solve social problems (Schön, 1983). Similarly, Nigel Cross in Designerly Ways of Knowing argues that along with the cultures of science and humanities, there is a third culture of design that “is not so easily recognized, simply because it has been neglected, and has not been adequately
named and articulated.” (Cross, 2008). This interaction between science, humanities and design is reflected in the need for innovation within organizations large and small—leading to new concepts in organizational strategy.

**DYNAMIC CAPABILITIES VIEW**

In volatile markets, it can be extremely useful for a firm to develop a core competency in responding to change. C. K. Prahalad and G. Hamel (1990) showed how core competencies relate to specific core products in their model presented in “The Core Competence of the Corporation” from the Harvard Business Review May-June 1990. However, it is also possible for a firm to develop core competencies that are not specific to any set of technologies or products, but rather to a set of abilities that enable it to quickly reconfigure its organizational structure and routines in response to new opportunities. Such competences are dynamic capabilities, those that enable firms to quickly adapt to emerging markets and user needs.

Dynamic capabilities are organizational and strategic routines by which firms achieve new resource configurations as markets emerge collide, split, evolve, and die. They represent specific and identifiable processes such as product development or strategic decision making (Eisenhardt & Martin, 2000). Richard J. Arend and Philp Bromiley evaluated the multiple perspectives of the dynamic capabilities view in their article “Assessing the Dynamic Capabilities View: Spare Change, Everyone?” They summarized the three viewpoints of Teece and Pisano (1994)/Teece et al. (1997), Eisenhardt and Martin (2000), and Teece (2007) in the following FIGURE:
Arend and Bromiley argue that the potential contribution of Dynamic Capabilities View is limited because it is unclear how it adds value compared to other models. They believe it needs a more coherent foundation and empirical support in order to express clear, practical implications (Arend & Bromiley, 2009). Berkeley economist David Teece (1998, 72) who initially highlighted the significance of firm-related dynamic capabilities, points out that “it is relatively easy to define dynamic capabilities, quite another to explain how they are built.”

In this thesis, I propose that design becomes a dynamic capability when it moves from the responsibility of a person to an integrated function within an organization. Designers represent a compelling source of building innovation and competitive advantage when linked to a strategic functional role within the enterprise (Blaich & Blaich, 1993).
“We define dynamic capabilities as the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization’s ability to achieve new and innovative forms of competitive advantage given path dependences and market positions” (Leonard-Barton, 1995).

As David Teece (1998) references, it is relatively easy to identify design as a dynamic capability for an organization, but it is much more difficult to build it into an organization’s strategy. Brigit Helene Jevnaker (2009) discusses this relationship in *Mediating In-between: How Industrial Design Advances Business and User Innovation*, “Design and designers can also be related to and extend how enterprises and their core groups actually come to sense and seize business opportunities, and renew their organization’s distinctive competencies, which have been coined ‘dynamic capabilities.’” Jevnaker speaks to how to overcome the gaps of understanding between design and business, seeing dynamic capabilities as a critical link (Jevnaker, 2009).

Based on the dynamic capabilities models of Teece and Pisano (1994)/Teece et al. (1997), Eisenhardt and Martin (2000), and Teece (2007), along with the exploratory framework for building creative capabilities from Napier and Nilsson (2006), I have created the following theoretical model for building design as a dynamic capability within an organization.
Figure 2: Building Design as a Dynamic Capability
As seen in figure 2, the model proposes three primary components, (1) the interaction of the design process within the organization, (2) the role of the design management function to both integrate with the design process and establish its value outside, and (3) the actions of the design management function to capitalize on design as a dynamic capability to both protect against competition, and support organizational assets to create a sustained competitive advantage in the marketplace.

Both Dan Harden and Sam Lucente were able to use design as a dynamic capability in their organizations and either protect or support their assets, creating value for design and supporting the growth of their companies. Dan was excellent at stimulating Whipsaw’s design process with diverse individuals and generating both intellectual property and unique designs that not only solved problems, but created advantageous positions for their clients in the marketplace.

FIGURE 3: DAN HARDEN’S WORK TO BUILD DESIGN AS A DYNAMIC CAPABILITY AT WHIPSAW INC.
With Dan at the helm of Whipsaw Inc., they have consistently delivered successful and competitive designs, that have allowed them to negotiate for ownership in the companies they support and design fees that respond to the product’s performance.

Sam Lucente was able to transform design into a dynamic capability for Hewlett-Packard, because he was able to strategically navigate the large bureaucratic system, and gain support for design from top executives including Chief Executive Officer Mark Hurd. Sam created an efficient design process that consistently produced quality concepts which linked all of H-P’s brands together. Through this work, Sam was able to communicate the value of design in terms of business and demonstrate how his team’s work supported H-P’s assets.

*Figure 4: Sam Lucente’s work to build design as a dynamic capability at H-P*
Sam understood the key to elevating design (Figure 4) was to link every stage of the design process to HP's global supply chain. He also realized that to have the freedom to establish design at such a central, strategic position, he had to earn approval top-down, and build capabilities bottom-up. To do this, Sam built case studies to showcase design’s contributions and developed a model for design teams to use as they collaborated with HP engineers and business partners called the “d³ Matrix” (Lucente, et al., 2008).

The D³ Matrix (Figure 5) aligned design goals to simplify, differentiate, and innovate with organizational goals focused on HP’s process, products and supply chain. By integrating design within company objectives, Sam solidified design’s role in HP’s strategy.

**FROM A PERSON TO A FUNCTION**

Dan Harden and Sam Lucente are great examples of individuals who see beyond the typical boundaries of one field and are able to lead a multidisciplinary team to interdisciplinary results. Both know how to leverage the value of design in terms of business and engineering, and have made incredible contributions as an individual and as part
of a team to support their organizations. With careful and intelligent decisions they achieved positions of influence that created environments where design could succeed. But in both cases, they represented the ventriloquists of the whole operation. It was their decision making, strategic moves, and knowledge of design and business that created value for the organization.

This reliance on an individual to elevate design strategically is what makes it challenging to sustain. As Dan and Sam phase out of their roles, or move to other projects, if a similarly trained and capable leader does not take their place, the whole system falls apart. Sam Lucente talked about this during an interview after he left Hewlett-Packard. Sam discussed how some of his strongest leaders in design were moved to other practices because of their transdisciplinary abilities. This immediate shift is reflective of the frailty of the design group once their leader left—even with the D³ Matrix (Lucente, 2011).

Dan Harden would likely face similar challenges if he retired from Whipsaw. His courage in creating agreements with clients and confidence in his teams’ ability rocketed Whipsaw from a start-up to a leading industrial design firm in less than ten years. Dan talked about how he is establishing a design culture at Whipsaw to help them grow and sustain their competitiveness (Harden, 2011). This approach differs from Sam’s, but it does not remove the dependence on a single person to define how their creative capabilities are valued.

Leaders are needed within every organization, but a sustained competitive advantage comes from a design function, not a design hero. Organizations must build design management teams that are able to be nimble as organizational priorities shift. As a function, they must be able to drive value from design as a dynamic capability, protecting from competition and supporting their organizational assets. Finding professionals who are able to manage both design and business is challenging, but several institutions have begun to experiment training new ‘hybrid’ students those with business degrees and design sensibility, and those designers with management knowledge.
EFFECTIVENESS OF DESIGN THINKING IN SUPPORTING

DESIGN AS A DYNAMIC CAPABILITY

CREATIVE CAPABILITIES

Recent design and management research emphasizes new complexities of working with multiple specialists and critical interest groups that stretch their abilities in order to reinvent and differentiate offerings faster than before (Hamel, 2002; Vogel & Cagan, Creating Breakthrough Products, 2002; Leonard-Barton, 1995). Additionally, a designer’s ability to act strategically is recognized, yet seldom formally included in strategic management (Blaich & Blaich, 1993). Researchers investigating how creative organizations promote creative capabilities to generate value have found that the most successful organizations have “creative entrepreneurs,” who build collaboration, exploit knowledge, and enhance relationships in and outside of the organization (Napier & Nilsson, 2006).

Nancy K. Napier and Mikael Nilsson’s (2006) exploratory framework (Figure 6) details how creative organizations develop and use routines and processes to strengthen their ability to collaborate across disciplines to achieve a specific creative outcome. In their framework, they place the creative entrepreneur at a critical place, as the...
“architect, supporter, and developer of creative capabilities” (Napier & Nilsson, 2006). Through their case studies they highlight the pivotal role of the creative entrepreneur in multiple organizations, and these same insights can be found while inspecting the work of Dan Harden and Sam Lucente. Dan and Sam both acted as entrepreneurs within their organizations with a strong confidence in their teams’ creative capabilities. Their efforts allowed their organizations to generate resource yielding competitive advantage from their creative capabilities.

Napier and Nilsson’s framework suffers from the same challenges expressed by David Teece (1998) of dynamic capabilities. It is simple to define creative capabilities and identify creative entrepreneurs, but it is difficult to explain how they are created or sustained. The organizations represented by this framework are only as strong at empowering creative capabilities as the individual creative entrepreneur. When this individual leaves, the organization is left fragile and uncertain moving forward—there is no organizational structure, only an individual.

**DESIGN PROCESS**

“Men of business tend to be practical and functional in their thinking; if they were poetic they probably would not be businessmen. Therefore they have neglected the aesthetic factor in consumption.” Philip Kotler’s (1973-1978, 48) may not represent every relationship between design and business, but they do express the distance a designer may feel within a large organization from strategic decision making. This gap between design and business is also reflected in the way Napier and Nilsson express the creative process in their theoretical model.

![Figure 7: Napier and Nilsson's Representation of the Creative Process](image)

In **Figure 7**, the creative process is shown as linear, step-by-step routine; however a successful design process is better-informed when it involves more iteration and assessment during a concepts’ development. Jenn and Ken Visocky O’Grady demonstrate this energy in their model of this process.
As seen in Figure 8, Jenn and Ken Visocky O’Grady’s model directly reflects the iterative nature of the design process compared to Napier and Nilsson. The O’Grady’s distinguish that this process is sometimes simple but often complex, and that the design process varies widely between different designers and studios (Visocky O’Grady & Visocky O’Grady, 2006). These variances are not separations from a single model of design process, but a reflection of its dynamic ability to adjust depending on the type of problems and teams assembled.

**DESIGN THINKING**

These perceptual gaps between design and business and the success of organizations using design and design process as a tool for “moving to the upper-right,” to create breakthrough products has created a great deal of interest in the innovative outputs of design (Vogel & Cagan, Creating Breakthrough Products, 2002). Robert and Janet Blaich (1993) in their book, *Product Design and Corporate Strategy: Managing the Connection for Competitive Advantage*, emphasize how designers must convince their industrial partners of the unexpected benefits from design. Robert and Janet Blaich note that this can be highly challenging, but it is important for the success of organizations to embrace the value of design.
In *The Reflective Practitioner*, Donald Schön (1983) suggests that designers combine tacit knowledge and critical thinking in the context of design. Through this process, designers develop rigor and are capable of both “knowing-in-action,” skillfully acting on something without prior thought, and “reflecting-in-action,” thinking while one is doing something (Schön, 1983). Both of these qualities are developed by designers through design education and career development. They are not however an integrated component in business or science education.

Reflection aids designers in framing problems. Schön’s reflection-in-action poses the question “What if?” and then analyzes its implications. This question and consequence practice shows “how reflection-in-action may be rigorous in its own right, and links the art of practice in uncertainty and uniqueness to the scientist’s art of research” (Schon, 69). This inquisitive and action-oriented process is how designers are able to embrace divergent problems with adaptive levels of expertise, collecting appropriate knowledge and testing the status quo.

Design thinking, as an approach to finding and solving problems, was developed to support an organizational interest of including non-designers in the design process to expand innovation capabilities. The methods that became design thinking were developed after generations of designers refined the design process inside and outside of organizations (Vogel, History of Design Thinking, 2009). These methods reflect both convergent and divergent productive thinking, developing and maintaining several lines of thought in parallel, and balancing these in equal proportions (Lawson, 2005).

**DESIGN THINKING IMPROVES COLLABORATION**

At the University of Cincinnati, several programs were started by faculty members interested in using creative methodologies like design thinking to challenge students to collaborate across disciplines. Three of the architects of these experiences were my committee members, Professors M. Ann Welsh, Dale Murray, and Craig Vogel. Dr. Welsh and Professor Murray were some of the first to experiment combining undergraduate students from industrial design, engineering, and business to solve challenges for businesses. Through many cycles of co-teaching these studio experiences with diverse groups of students; they showed how students would develop multi-layered coordination systems that supported their transdisciplinary interactions. Welsh and
Murray along with Professor Gordon Dehler, noted that “leaders foster innovation by facilitating the adoption of a creative identity by a team, effectively managing the emotion relative to this identity, and competently utilizing influence processes” (Welsh, Dehler, & Murray, 2007). Through these experiences the faculty recognized the transformative experience of working across disciplines and the effectiveness of using design thinking for facilitating this process.

Associate Dean Craig Vogel built upon the institutional knowledge established by Professors Welsh and Murray, and his experience at Carnegie Melon University to create the Live Well Collaborative (LWC) at the University of Cincinnati. The LWC represented a major investment in the value of this design thinking in both the academic portfolio of a student, as well as the contributions to problem solving for large organizations. The collaborative was established in partnership with Procter and Gamble, and has since expanded to companies including General Mills, Hill-Rom, Boeing, and Kraft. Without a doubt the ability for the University of Cincinnati to assemble diverse teams of students and facilitate their collaboration towards solving large problems is valued by student participants as well as corporate clients.

The students that experience the multidisciplinary studios build an ability and willingness to collaborate with others in addition to the mastery they develop from their fields of study. They become design thinkers because of their experience working across disciplines and supporting a problem solving technique with a design outcome. Professor Welsh refers to non-designers developing not only an understanding of how to work with designers, but also deep understanding of design as professionals with “design sensibility” (Welsh, Non-designers and Design, 2011).

**Misperception of Design Thinking**

As seen by Welsh, Murray and Vogel in academia, the value of these multidisciplinary students is equally as interesting to organizations as multidisciplinary professionals. However, looking at the theoretical model for building design into a dynamic capability (Figure 2), these multidisciplinary professionals do not replace the need for designers in the creative process—instead they are important collaborators with potential responsibilities in the design management function.
Many individuals and organizations are misled by misperceptions of design thinking. As I illustrate below, many see design thinking as a tool for helping non-designers become designers (FIGURE 9).

Design thinking does not actually provide enough training or knowledge for non-designers to become renewed as hybrid designers. Instead, what they develop is a skill set for collaboration and a confidence in visualization and prototyping—a philosophy.

As shown in FIGURE 10, design thinking is an ability that one can develop. Many designers are great design thinkers, because of their experiences from design education and as a professional, but many designers are not design thinkers—some deny its validity. Furthermore, non-designers are not all design thinkers; many work to develop the set of skills because it supports their capabilities, yet not every non-designer is a design thinker, or needs to be a design thinker.
A critical separation between designers and design thinkers is the mental discipline that a designer develops through the foundations of design. As I learned from my transition as an undergraduate business school student to the master of design program I gained deep insight on this difference. I entered with a confidence in leading teams of designers in reaching innovative solutions from my experience on multidisciplinary teams. But in my entrance to design school I was thrown right into the gauntlet—the accelerated foundations courses of design where the whole first year of industrial, graphic, fashion, and digital design are compressed into 10 weeks.

Through this rigorous experience, I had no choice but to think and act as a designer would, using parts of my brain that seemed untested since Studio Art ap in high school. I discovered that design was as much about one’s creative output as it was one’s mental discipline. With my mind still shaped around identifying and capitalizing on value, I sought to genuinely understand the creation of value in a product or service. What I realized is that the value of design isn’t simply about a great idea—it is about being a great idea. It is through craft and processes designed for quality that help designers succeed.

Cindy Tripp, Procter and Gamble’s Marketing Director of Global Design, spoke to this in her master class on Design Thinking for Business at the University of Cincinnati’s College of Business. She discussed the evolution of design thinking at Procter & Gamble and talked about her experiments around the world training others in design thinking for innovation. She admitted that design thinking is not a set of tools and should not be used in every situation; however recognized that Procter & Gamble’s ability to succeed with design thinking is based on their integration with designers and the sophisticated development of design management. By linking multidisciplinary teams trained in design thinking with design managers, the full value of design can be realized across the company (Tripp, 2011).

Through Cindy Tripp’s lectures, she introduced her approach to design thinking as the following: (1) framing the problem, (2) design research, (3) developing concepts, and (4) rapid, low fidelity, prototyping and evaluation. In Figure 11, this process is visualized as it relates to the design process presented by the Visocky O’Grady’s (2006).
As you can tell by comparing Figure 11 to Figure 8, design thinking is only part of the design process. It is missing the refined prototyping and craft from designers, as well as the second and third stages of evaluation and assessment that rapidly transform a concept into a tested and producible product, service or experience.

Design thinking overlooks this critical element of design. Teams of design thinkers independently can develop great ideas, but fall short of the actualization of these ideas when there is no team of designers or structure to value design within an organization. Innovative ideas are not measured in their quantity, but in their quality and time-to-market.

Design thinkers are valuable to organizations building design into a dynamic capability, but not without designers. Many non-designers have a design sensibility and are dedicated to collaborating with others to produce innovative concepts for the organization, but designers transform ideas into intellectual property which protects against competition and builds upon the assets of the organization—exceeding customer expectations. Without this effect, design is not a dynamic capability, and nor will there be a sustained competitive advantage.
DESIGN MANAGEMENT: THE CRITICAL FUNCTION

An organization can have talented designers and design thinkers who are well seasoned collaborators, but without a supporting design management function, the whole system will fail to become a dynamic capability. Procter and Gamble (P&G) under A. G. Lafley experienced this first-hand. Cindy Tripp explained P&G’s transformation after A.G. was named Chief Executive Officer. A. G. Lafley strategically placed design at the center of one of the world’s largest corporations, making decisions similar to Dan Harden and Sam Lucente. As a non-designer, with a design sensibility from living and working in Japan, A. G. found teams of advocates to include design in everything that they did. He hired people who could build a culture of design within research and development and marketing, as well as create P&G’s first corporate design function (Tripp, 2011).

Today, A. G. Lafley is no longer the CEO of P&G, but the design function still coexists, with a design thinking function in Marketing. Design has lost some significance as a priority for its new leadership—Design now reports to the Global Vice President of Marketing, instead of the Chief Executive Officer, but the function still remains a dynamic capability for the organization. Now Procter & Gamble regularly hires designers as “Design Managers” across the globe and trains international teams as design thinkers to uncover new opportunities for innovation. There is still opportunity for growth and a consistent organization that pairs together design thinkers and designers, as well as a design function that is more closely aligned with research and development, but A. G. Lafley’s leadership and dedication to the strategic organization of design within P&G has produced many new billion dollar brands and elevated others in both mature and emerging markets.

IN SEARCH OF TALENT

A.G. Lafley represented a transformative professional, similar to Sam Lucente and Dan Harden, however he is not a designer by trade. What Lafley understood was the value and potential in terms of innovation and market competitiveness. He was as much a serendipitous leader as Lucente and Harden, however he focused on creating a function rather than relying on his insights or one person’s. But a major challenge in establishing a function is supporting it with talent. People are not currently trained to manage design as a dynamic capability, nor are hiring processes set up to screen for people who are
both designers and strategic business partners. Cindy Tripp recognized Lafley’s commitment to this when he sent two of his best designers to Harvard Business School to get an MBA. The leadership of Harvard was confused why Lafley, a board member and alumnus of the university, was sending designers to business school. What they learned was the divergent perspective of the designers provided an enlightening experience for both faculty and classmates at Harvard—designers truly had a special view of business (Tripp, 2011).

In order to get the people he needed, Lafley had the resources to both recruit and train leaders at the finest institutions. Not every organization has these resources. In an interview with Tim Brown, CEO of IDEO, he reflected on the challenges of recruiting “great design thinkers” who possess an ownership of “both creative and analytical problem solving.” He mentioned how most of the MBA students trained in design thinking struggle, “they resort to incremental tools...they lack the ability to integrate strategic skills and strategic ideas.” Mr. Brown shared his passion for entrepreneurs who are very good at discovery based planning and expressing their ideas in visual ways. “They experience design thinking first-hand; they are involved in every step and must develop an ability to articulate the value of design in the context of their product or services” (Brown, 2011).

Mr. Brown and I talked about the role of design management and strategy within organizations, of whom he identifies as “those who have seen the light.” He continues “we all have to be both [business and design thinkers]; because there are many skilled designers—but those who are able to reduce strategic ideas of design to practice are valuable. They can both make stuff and drive the business needs of the client.” IDEO refers to these people within their organization as business design specialists, individuals with “a unique blend of real-world experience and theory, entrepreneurial zeal and boardroom polish.” What IDEO and other firms seem to be looking for are not simply non-designers who value design thinking, but designers whose capabilities are multidisciplinary.
CONCLUSIONS

The design process is unique for every project and every team. By its nature it reconfigures resources and activities, includes multilayer user research, and responds quickly to competition. There is a lot of value organizations can find from design, but to generate the most, it must be strategically supported. The model proposed in this thesis (figure 2) identifies how the creation of a design management function with the appropriate top-down and bottom-up support can transform the value of design for an organization. When design is seen a dynamic capability, organizations will realize the competitive advantage they gain and “difficult to replicate” expertise they develop within their organization from its intricate blend of personalized imagination and highly interactive activities (Teece, 1998).

RECOMMENDATIONS

With a model for building design as a dynamic capability supported by two case studies and experience with the integration of design and business, I see the following as key areas of focus for the successful elevation of design as a dynamic capability:

- Design successfully advances an organization when top leadership not only understand its potential impact, but also endorse its strategic integration
- Design thinking is supportive, but not sufficient for organizations to sustain a competitive advantage
- Design as a dynamic capability within organizations requires the support of a design management function
- Design education must evolve to include business analysis as a component of design critique to produce better candidates to support this function
- Interdisciplinary collaboration and design thinking must become core components of accredited business education
- Joint graduate degrees that promote the craft and process of design, as well as the organizational strategy of business must be developed
• Systems for expressing the value of design (see HRT 4) in the context of business must be extracted from corporate best practices and refined for general use

• Organizational strategies must be introduced to design consultancies to support their growth and development, and remove the dependency on a single design hero

• Additional research is needed to support dynamic capabilities view—specifically those that investigate design’s role as a dynamic capability, and test the efficacy of these recommendations

Design is more than creatively expressing an innovative idea—it is personal and relevant. By elevating design strategically, an organization can exceed stakeholder expectations and advance its assets. This multifaceted dynamic capability can and will only be revealed through strong and continuous design and business relations.

CLOSING THOUGHTS

This thesis began with two case studies of contemporary leaders in design, Dan Harden and Sam Lucente. Their contributions as designers and design managers have changed the way design is valued within large and small organizations. In the context of these case studies, I extracted lessons that were integrated into a generalized model for elevating design within organizations. I then tested this model seeing if it fit within Harden and Lucente’s experiences, and confirmed its success at allowing us to focus on their distinctive approaches within an integrated framework.

Supporting this framework were insights from my design and business education. Using established theory as a base, I presented the argument for design as a dynamic capability. At its heart, dynamic capabilities include a capacity for learning and evaluation—this reflection is what ultimately bonds the two together. Finally, I extracted a set of recommendations from the integration of experience, theory, and practice, and suggest for further research to be done to test the efficacy of these recommendations.
BIBLIOGRAPHY


APPENDIX

EVOLUTION OF DESIGN AND STRATEGY

THE RISE OF DESIGN THROUGH INDUSTRIALIZATION

Before World War II, the most successful companies in the United States were known by their infamous insiders and stories of their ingenuity and heroic decision-making. Industrialists represented by Carnegie, Rockefeller, J.P. Morgan, and Ford, promoted the rapid growth of the modern corporation through their support for Frederick Taylor’s theories of scientific production. Associate Dean Craig M. Vogel of the University of Cincinnati College of Design, Architecture, Art and Planning (daap), speaks to these forces in his Design Management Review article, “Notes on the Foundation of Design Thinking: A Work in Progress:”

“For most of the 20th century, the dominant argument driving change was in the area of mass manufacture and distribution as directed by captains of industry using statistical methods of management and the emerging scientific method employed by corporate r&d.” Vogel notes, that “only one company in a market can be the cheapest; the rest need design” (Vogel, 2009).

With this need for design as a tool for differentiation came new competitive strategies and a focus on the craft of industrial products that offered additional value to a product’s utilitarian function. Early designers acted either as consultants like Raymond Loewy or within major organizations like Harley Earl at General Motors, using the design to attract new customers away from corporate leaders. Associate Dean Vogel suggests that not much has changed in terms of using design to differentiate citing Target’s positioning compared to Wal-Mart.

DOMINANCE THROUGH DESIGN

After World War II the American economy made a major shift, utilizing factories converted for the war effort to creating products utilizing the highly skilled laborers in new manufacturing technologies. These new capabilities were met by demands from an American population who could now afford more of these less expensive goods, marking the beginning of a new era where customers became consumers and the rise of the middle class meant more opportunity for competition in the marketplace (Glickman,
Companies expanded rapidly to meet these needs with little consideration for developing new models of operation outside of those that were successful before the war. Early 20th century business moguls and a small community of designers served as inspiration for this new generation of American products and companies. The dedication of these figures may best be represented by the year 1949 when Charles Erwin Wilson, CEO of General Electric, and Raymond Loewy both appeared on the covers of Time Magazine. (Vogel, 2009)

AN ECONOMY LED BY HEROES

“You had to be there, in the torpid corporate mind-set of the 1950s and early 1960’s... most companies felt themselves largely at the mercy of market forces, with little of the knowledge they would need to truly determine their own future” (Kiechel iii, 2010).

As a response to growing systems of corporations, business scholars and design leaders developed a refined approach in organizational strategy and the creation of a design process. Walter Kiechel iii, summarized the modern conversation about corporate strategy in his article, Seven Chapters of Strategic Wisdom. Beginning with Alfred D. Chandler Jr.’s Strategy and Structure: Chapters in the History of the American Industrial Enterprise in 1962, Kiechel believed that it was “the first to grapple with the concept [corporate strategy] in a way that informed much subsequent discussion.” Chandler Jr. analyzed the way four of the largest companies of the time—Dupont, General Motors; Standard Oil of New Jersey, and Sears, Roebuck and Company—changed their organizational structure to meet the challenges of the early 20th century. Before Chandler Jr.’s work, “few companies had any framework for plotting the course of their growth using and integrated understanding of costs, customers, and competition” (Kiechel iii, 2010).

As corporate strategy emerged in the early 1960’s, so did a more refined and scientific approach to design. Designers, like Henry Dreyfuss, began to focus on a human-centered approach to design, one that “integrated human factors with appropriate aesthetics, rather than depend solely on statistical analysis.” In 1955, Dreyfuss published Designing for People followed by The Measure of Man in 1960 which formed a “unique argument within the field by always emphasizing the need for logical approaches that produced elegant solutions” (Vogel, 2009) Dreyfus and his firm deeply understood the importance of a user’s relationship to an object, developing successful
products for large companies, including the now famous, Dreyfuss telephone for AT&T. Dreyfuss was accompanied by many great pioneers of design like Paul Rand and Elliot Noyes whose work provided influential large organizations their visual identities and in the case of IBM, its nick-name “Big Blue.” Noyes’ strategic integration of design within IBM became a blueprint for modern corporate identity systems, leading to what would become known as International Style.

Another leader of the time, George Nelson, the Design Director for Herman Miller in 1945, “brought a new level of design thinking to the concept of furniture design for the home and office... [his] designs and strategic plans epitomized the perceived function of the modern design manager” (Vogel, 2009). Along with George Nelson were a husband-and-wife team, Charles and Ray Eames, who contributed some of their most important designs while working under Nelson’s leadership. Through their experimentation with new media and materials, the Eames’ introduced new systematic approaches to design that became the foundation for furniture design throughout the 20th century. Products in the 1960’s and 70’s served as articles of expression, with many of the signature designs linked directly with their celebrated designers.

THE GREAT CHALLENGES

As the 1970’s came to a close, the 1980’s ushered in new challenges for American businesses and designers. The companies that succeeded after World War II were able to do so with little competition, but as global markets opened up due to the introduction of new technologies, both design and organizational strategy made major shifts to respond to the changed environment. Signature for Corporate Strategy was the publication of Michael E. Porter’s Competitive Strategy: Techniques for Analyzing Industries and Competitors in 1980. Porter’s work represented the change from few very large companies maintaining dominant market advantages, to new opportunities for other firms to catch market leaders sleeping.

Porter introduced new perspectives on corporate strategy, including a major focus on competition. His recommendations fell into three key strategic alternatives: (1) Cost Leadership, when a firm is a market-share leader and is able to sustain a cost-advantage because of their size that other smaller players can’t duplicate; (2) Seek Differentiation through the development of unique products and services; and (3) Target a specific
group of buyers, geographic territory, or a unique product segment. Porter felt that if you were unable to achieve advantage in one of these three ways, your company was heading towards major challenges.

As corporations prepared themselves for an infusion of competition, designers began to challenge the status quo. In 1976 Victor Papanek published *Design for the Real World*, which presented a dramatic shift from the utilization of design as a tool for capitalism. Papanek asked designers to understand the potential impact they could have for social and environmental responsibility. He realized design's potential for positive change and “accused designers of catering to the small percentage of consumers who have everything, while ignoring those in lower income levels and emerging economies, as well as people with disabilities” (Vogel, 2009).

Papanek’s philosophies were shared by two other significant designers, Buckminster Fuller and Ralph Caplan. Caplan used Mahatma’s Gandhi’s concept of non-violent protest as an example of one of the most effective design solutions in history through his book *By Design* in 1982. The ideas of Papanek, Fuller and Caplan were seen as radical and were rejected by many experienced designers at the time. However European designers and American design educators supported this challenge to the status quo integrating their ideas into a new generation of designers.

**A NEW GENERATION**

Liz Sanders, in a presentation in 2009 in San Francisco, “Generative Design Thinking” identified the evolution in the relationships between designer and audiences/consumers. In the past, the design paradigm was expert-driven, the audience role was as a customer and the activity was identified as consume (buy, shop or own). In the late twentieth century, shifts began to occur in this relationship and the paradigm was human-centered, the audience role was as a user, and the activity became linked with the experience (use, interact and communicate). Finally, she suggested that the relationship that was emerging at the end of the 20th and beginning of the 21st century was a design paradigm that facilitated, the audience role was as participant and the activity centered on co-creation (adapt, modify, extend, design, make).
“The 1980s were not kind to positionists. As deregulation and increasingly global competition spread the liberating effects of free markets, companies had greater difficulty holding the strategic ground they thought they had staked out for themselves” (Kiechel iii, 2010). The initial effects of globalization anticipated by strategist like Michael E. Porter left companies focused on competition and maintaining a single dominant edge, but as new entrants responded to market barriers, companies realized they had to be more nimble. In order to be successful in responding to competitors that don’t behave the way you expect, companies needed to develop a capability to make big bets on new products, services and management process that would give you the competitive edge—companies had to innovate.

Starting with Richard N. Foster’s 1986 book, *Innovation, The Attacker’s Advantage*, corporate strategists realized that changes in technology prevented sustained competitive advantage without supporting innovations. Foster presented his concept for an S-curve rather than the experience curve Porter suggested six years earlier. Foster’s observed that new technologies tend to grow slowly at first, however eventually as they improve; they rapidly push older, rival technologies out of business. The success of technology companies in the new global economy ushered a new urgency for companies to pursue innovation at all costs. Three new philosophies prevailed, (1) No matter how much you plan or what studies you perform, you cannot predict the future, and (2) know your customer, it is critically important, and (3) support and develop a competitive advantage through your organization’s capabilities as they compare to your competitors.

As companies shifted, young designers, no longer satisfied by the rigid design standards of Noyes, Rand, and Nelson, integrated the once rejected ideas of Papanek, Caplan, and Fuller into new philosophies of universal design. One of the first to reach market success was Sam Farber and his collaboration with Smart Design to develop OXO in 1990. Their work embraced the concept of universal design, improving the way users held everyday objects by designing for older adults with arthritis. Farber and Smart Design integrated new technologies and manufacturing processes with user research to reinvent what were currently considered market commodities—potato peel-
ers, salad spinners, and many other household products.

Design agencies grew as firms including ideo, Frogdesign, and Continuum used design research methodologies and human-centered design philosophies to soften the harshness of new technologies and create engaging experiences through the design of objects as simple as a toothbrush. New global challenges of sustainability and designing for emerging markets has made universal designers critically important in supporting corporations interests in building “a kinder, more humane brand message that connects to the social value system of their customers” (Vogel, 2009).

Both writings on strategy and design evolve as academics and practitioners seek to cope with new realities. Designers cope with pressures for developing innovative designs that meet client expectations, excite consumers, and avoid destroying our environment. While corporations have realized that their people’s talents and connections should be the basis for their strategy. This need for companies to be adaptive challenges organizations to find ways to ensure their strategies remain organic and has the ability to continuously react to changing circumstances.