I, Dianne Hardin, hereby submit this original work as part of the requirements for the degree of Master of Design in Design.

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The Innovation Imperative: Not Without Design

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The Innovation Imperative: Not Without Design

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Abstract

Today, the business-led conversation about integrating and leveraging “design thinking” is growing in popularity and influence. More and more examples of successful design-centric companies are being publicized, and senior leadership teams are increasingly being challenged to build design-driven organizations. This is a complex challenge; one that impacts every area of an organization including the structure, talent strategies, core skills and competencies, and measurement infrastructures. This thesis examines the questions: What is innovation, and why is it an imperative? What is design, how does it work, and why does it matter, and how does design intersect with innovation? What is a design-driven organization, and how do you create one? I develop The Sempathy Continuum Model as a model for assessing an organization’s design capabilities, and consider whether today’s design and MBA graduate programs meet the emerging demand for a new style of graduate.
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This journey and the resulting work would not be possible without a lot of assistance from many talented and supportive people. I am so fortunate that Professor Craig Vogel, my committee chair, directed my work, challenged my thought processes and pushed me to pursue new ideas. We could always find a new way to challenge each other, consider alternate points of view, and wind up with interesting new insights. The design process is not linear and neither were our conversations. And, that was the best part. As is the case with any journey of this nature, the place I have finished is a place I could not have imagined when I started, but one for which I am so grateful now that I am done. Your passion, knowledge, energy and unending belief in me was continuously inspiring and I am so honored to have made this journey with you. Thank you.

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This work explores both design and business innovation fields and was eloquently balanced by Professor Drew Boyd, whose appreciation, understanding and integration of design within the business world provided an influential balance of experience, practical application and insight. Your passion and focus on building new
bridges, finding new ideas and teaching others inspired me to look harder at my biases and find new ways to understand and learn from my own experiences. And, for that, I thank you, too.

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Chapter 1: Winning the Innovation Race

For the last nine years, Booz & Company (Jaruzelski, Loehr, and Holman, 2013) has identified and conducted research with the 1,000 public companies around the world that spend the most on Research and Design (R&D). As thought leaders and passionate supporters of innovation, they’ve studied these company’s financials and business strategies extensively. Their goal is to determine whether a correlation exists between the level of R&D investment and overall financial performance and to understand what the most innovative companies are doing that enables them to consistently outperform their competitors and the market. Consistently they find that there is no long-term correlation between the innovation spending and financial performance. What’s more, the companies that earn a spot on their Top 10 Most Innovative Companies list have been relatively consistent since the list’s inception, and most of them are not on the Top 10 Biggest R&D Spenders short list. In their work, Booz & Company concludes that the selection of an innovation strategy, the development of supportive capabilities, and the utilization of consistent decision-making processes are the keys to creating a differentiating and sustainable culture. They further argue that those companies that utilize what they term a “Needs Seeker” innovation strategy consistently outperform the market.

Booz & Company defines the “Needs Seeker” innovation strategy as a customer-centric philosophy combined with an emphasis on product excellence that is integrated into all aspects of the organization and the innovation cycle, including new product development, commercialization, manufacturing, logistics and customer experience. Needs Seeker is a term that recognizes the importance of using the deep empathic understanding of basic and emerging needs of consumers to drive the development of new services, information systems, and products.

This definition describes a fundamental approach that, I argue, is the practice of design. The challenge is that business executives and management experts have long been undervaluing, if not having difficulty
understanding and measuring, the role of design. To combat this market perception and create a platform for common discussion, the design factor has been positioned as “design thinking.”

In the Booz & Company portfolio of work, design and design thinking strategies are not overtly recognized but they are consistently represented in a variety of activities, albeit lumped into the practice of innovation. Is this by assumption? Is it simply due to a lack of design awareness? Or just simply by default? Design seems to play the role of the invisible D in innovation, and while it has now been “discovered” and is aggressively positioned as “design thinking,” the multiple perspectives attempting to define its value, use, and processes often create more confusion than clarity. Frequently, design practices use the innovation label to brand and describe their practices, presumably to capitalize on the business familiarity with the term and describe their activities in a more familiar way. The reality is that, in the literature of both fields, the terms innovation and design are frequently used interchangeably, as both verbs and nouns. The challenge then is to explore design and innovation practices to determine the overlap and differences—an important distinction to understanding the core competencies and practices and the contributive value of each. The end result is a starting position for building a design-driven organizational culture that leverages the contributions of both practices, creates breakthrough products and market disruptions, and propels companies to leadership positions in their respective fields.

What Is Innovation?

To explore and understand each field of practice, it is important to begin with some definitions. Merriam-Webster (2014) defines innovation as a noun meaning “a new idea, device, or method; the act or process of introducing new ideas, devices, or methods.” Merriam-Webster’s definition is an interesting place to start but the term “innovation” is a multi-function word, one that is often used interchangeably with R&D, and Design. The verb form—innovate—is often used as a verb to describe the process of seeking out points of change and identifying the resulting opportunity gaps, followed by activities associated with evaluating the potential of the ideas and developing artifacts that address those gaps. Peter Drucker, who is often hailed as
“the man who invented management,” defines innovation as the set of activities focused on identifying social and cultural change and taking advantage of the gaps that present themselves as a result of this change (Drucker, 1985). This is the definition that is used for the purposes of this paper.

**What Is Design?**

Merriam-Webster (2014) defines *design* as a verb meaning “to plan and make decisions about (something that is being built or created); to create the plans, drawings, etc., that show how (something) will be made; to plan and make (something) for a specific use or purpose; or, to think of (something, such as a plan) in your mind.” Again, the Merriam-Webster’s definition is an interesting starting position but the design literature is also full of design definitions. The term “design” is a also a multi-function word, one that is often discussed in the design field as both a verb—the process and art of bringing ideas to fruition—and as a noun—the role of design in an organization, in a society, a culture. Herbert Simon, the person whose work is often credited with the best representation of design, defines design as the practice of “changing existing situations into desired ones” (Simon, 1969).

For the purposes of this paper, the definition of design—the verb—is the functional practice of skillfully visualizing and producing physical manifestation(s) of an object or a system that is based on an empathic collection of knowledge gathered using disciplined empathic and cognitive research processes to create connections with people. As a noun, design is defined as the role of change agent in organizations, groups and societies, constantly observing and recognizing trends that are influencing changes in cultural belief systems, and positively influencing a cultural reallocation of resources to create new connections with people and solve whole problems to produce new artifacts or systems that generate economic value.
What Is Design Thinking?

The same verb-noun distinction can be applied to design thinking. The current conversation surrounding “design thinking”—driven in force by Tim Brown at IDEO—has provided a key leadership platform within the business community at large. Tim Brown (Brown and Katz, 2009) describes design thinking as:

“A way of describing a set of principles that can be applied by diverse people to a wide range of problems.” It is a process that involves “collaborative, multi-dimensional teams that flourishes in a rich culture of storytelling that explores different possibilities, visualizes relationships and presents a more intuitive sense of the whole idea” (p. 20).

He goes on to explain that innovation is a:

“Continuum best thought of as a system of overlapping spaces rather than a sequence of orderly steps. The system is composed of inspiration—the problem or opportunity that motivates the search for solutions; ideation—the process of generating, developing and testing ideas; and, implementation—the path that leads from the project room to the market (p. 20).

He defines the role of the designer as “converting need into demand.” And their job is “to help people articulate the latent needs they may not even know they have” (p.20). For the purposes of this paper, as a verb, design thinking is defined as the synthetic integration of technology, emerging trends, empathic insights, brand, and operations into the consumer interface with the company to generate improved experiences for consumers. In this definition, design thinking is integrated into the processes of strategic planning as a noun. It is then used as a verb when referencing the activities that actually translate the plan into tangible solutions that create a continuous dialogue with the company and a set of valuable experiences for the customer. The insight here is that Tim Brown’s platform uses the terms “design thinking” and “innovation” interchangeably to more fully describe what Booz & Company calls a “Needs Seeker” innovation strategy and what I refer to as a component of a “design-driven” culture.
While designers are formally trained on these design-thinking processes, and they work for years to hone the craft of visualizations, prototyping and iterations, the literature repeatedly argues—and my thesis research reinforces—the belief that non-degreed, yet formally trained design-thinking specialists can be, and are, just as effective leveraging their experience and handling design requirements in open-minded, free thinking and progressive ways. While I agree that there is value in training non-designers in alternate ways of thinking and problem-solving activities, if brief workshops, week-long seminars and continuing education series are sufficient to teach these thinking processes, the question then becomes, “what unique value do formally educated designers bring to an organization?”

**What Is a Design-Driven Culture?**

A design-driven culture is as much an organizational philosophy as it is a technical set of capabilities. It is the cumulative ability of the organization to emphatically listen and identify cultural changes, personal value systems and opportunity gaps, then creating new ideas that address those gaps in meaningful ways. Just as critical is the capability to successfully evaluate, select and translate the best ideas into actionable plans that proceed through the design process to create a continuous dialogue with the company and a set of valuable experiences for the customer.

I argue that the core of Booz & Company’s “Needs Seeker” innovation strategy is an underlying design-driven organization; one that has created an alternate lifestyle that includes both cognitive and emotive approaches to innovation thinking as well as deep seated, design oriented “make” proficiencies and competencies. This design-driven culture happens when innovation and design competencies and activities actively live on an innovation-design continuum, iteratively moving from one end of the spectrum where the focus is on innovation activities—the world of ideas and insights (cognition and research)—to the other end of the spectrum where the focus is on design activities—the development, application and delivery of a system of artifacts (visualization, models and iterations)—and back again. It is along this continuum where innovation
and design take the form of nouns and verbs and where empathy, a key design-thinking core competency, becomes a critical organizational skill set.

What do we mean when we use the term “empathy?” Empathy is another multi-functional term that is organizationally challenging to define, develop and manage. Merriam-Webster (2014) defines empathy as a noun, stating “the feeling that you understand and share another person’s experiences and emotions: the ability to share someone else’s feelings.” Simon Baron-Cohen (2011), Professor of Developmental Psychopathology at University of Cambridge, defines empathy as “our ability to identify what someone else is thinking or feeling and to respond to that person’s thoughts and feelings with an appropriate emotion” (p.10).

In this definition he recognizes two stages: “recognition and response,” both of which are needed to have an empathic experience (p.10). Michael Slote (2011), UST Professor of Ethics at University of Miami, states “a large part of what it is to be open-minded or fair-minded is to be willing and able to see things from the point of view of those one disagrees with. This clearly involves being empathic, but it is empathy with opinions and arguments—rather than empathy with sheer feelings like pain, pleasure, sadness and joy—that is most relevant to the cognitive/epistemic side of our lives” (p. 14). I think this is an important idea about the nature of empathy—that we can be empathic about more than just emotions. If we extend Slote’s argument into the world of design, we can quickly find examples of designers who are not only empathic with human emotions, opinions and arguments but who are also empathic with human conditions, organized activities, and complex systems as well as with the elements of good design. For this paper, empathy is defined as “good design that is reflective of caring for others in a deeply connected way.”

What is good design? Again, the literature is full of definitions of good design that consider various elements of artifacts. Tom Wujec, a design fellow at Autodesk, author of three books on creative thinking and an international speaker and Jon Pittman, vice president of corporate strategy for Autodesk, lecturer at the Haas School of Business at UC Berkeley, and award-winning designer with more than 25 years of experience in the computer-aided design, computer graphics, and Internet industries, create a more comprehensive model of
good design that includes 10 key elements, segmented into verb and noun definitions that they present in the book *Imagine Design Create* (Wujec, 2011).

This model defines the verb as “collaborating, building and testing to create solutions that address human needs and improve our world” (p. 29). It includes the elements of spark, process, tools, experience, and systems. The model defines the noun of design as the intended physical and emotional meaning conveyed through the crafted qualities of the image, object or experience (artifact by my definition). It includes the aesthetic, functional, growth, sustainable and emotional elements. This noun definition is slightly different than my noun definition of design—the role of change agent in an organization driven by empathy as a core competency. Yet, it is still helpful in understanding how good design and empathy contribute to a design-driven organizational philosophy.

In practice, empathy requires that designers have an interest, willingness and motivation to create an empathic connection with their audience. But, not everyone is inclined to be, or even capable of being, empathic with the human condition. This is because empathy is a two-step process: recognition and response. I argue that, typically, the processes of innovation and design thinking can create new ideas and a sympathetic understanding of a specific area of study that can produce solid, meaningful solutions. But, it is the pursuit of empathy that motivates a design-driven organization. What is the difference? *Sympathy* is defined by Merriam-Webster (2014) as a noun, stating “the feeling that you care about and are sorry about someone else’s trouble, grief, misfortune, etc.” which is in line with Baron-Cohen’s (2011) first stage of empathy: recognition. Empathy is a progression from sympathy and involves a deeper understanding and connectedness with people that creates motivations and drives change. In reality, not everyone in an organization has to be, or needs to be, empathic at the same level. The diversity in thinking and approach that comes from the differences in understanding and connectedness provides richness to a collaborative effort that creates better outcomes. But, as empathy may be the goal of a design-driven organization, the pursuit of empathy in the
innovation and design-thinking processes occurs as a progression of stages. To that end, I present:

“The Sempathy Continuum Model.”

This model represents the idea that the pursuit of good design in organizations occurs in stages. It is meant to be a tool that organizations could use to understand the extent to which empathy is influencing their motivations and decision making, their understanding of the human condition, and the actualization of their artifacts. The model defines seven emotional positions on the path to empathy (a state of both recognition and response) that start with ignorance and go to awareness, interest, sympathy, understanding, compassion, and ultimately to empathy. When applied to the range of human condition and the elements of design to determine the level of organizational literacy, it provides a multidimensional evaluation of organizational capabilities. In Chapter 2, I examine innovation, design and design thinking, and the idea of good design in more depth. I then develop The Sempathy Continuum Model and consider how it successfully creates competitive advantage.

In Chapter 3, I evaluate Booz & Company’s body of work, examining its argument that the top innovative companies create a “needs-seeking” innovation culture. In this work, we can see evidence that there is a continuum of the understanding of, and perceived value about, design in global corporations. Very few companies see the value of design as a strategic participant (noun). Many see its use as a narrow service (verb) and, as such, have defined design narrowly to carry out direct instructions for plans developed by marketing and/or engineering. In other companies, design has shifted on the continuum and is more broadly defined, where designers are part of teams (verb) but do not participate at the planning level (noun). At the far end of the spectrum, design is well understood within the company as a key strategic tool (noun), and design is represented at the senior company levels. This results in a greater integration of design throughout the planning (noun) and execution process (verb). Booz & Company’s defined integration strategies—Needs Seeker, Market Reader, and Technology Driver—present evidence of The Sempathy Continuum Model and show how design impacts an organization’s success.
In Chapter 4, I look at the results of the FuturED research project and Chicago design workshop to examine whether MBA and design graduate level education is adequately combining the key competencies from these disciplines to produce enough graduates with the necessary cross-functional skills to create and maintain design-driven organizations. You can’t grow it if you don’t know it. I argue that most of today’s graduates and functioning leadership teams have not been exposed to design or design thinking at all, let alone familiar with them, and using them, as strategic competencies. The business perception of design is that it is used to develop a great logo, a creative poster, or a fundamental key to the production of “pretty things” happening. I also believe that this perception is starting to change, in part due to the conversation around design thinking which is driving the demand for a new type of executive. The increasing emergence of business graduate programs with an emphasis on design thinking is evidence of the changing understanding of design as an integral part of an organization’s DNA. Concurrently, graduate design programs are acknowledging and modifying their programs to enable their students to ‘mainstream’ their work and to speak the language of the C Suite. The importance of articulating the rigor of design research to competently position strategic decisions is being taught in design schools, along with marketing, sales and business case theory and tactics. MBA programs, engineering and design schools must continue to redefine and expand their programs to embrace a broader definition of design, identify the unique design approach in each discipline, and recognize the integrating value of each approach as part of a consumer-driven innovation process.
Chapter 2: Innovation, Design & Design-Driven Organizations

As a practicing business manager and a recently formally trained designer, I was struck by the conversation termed, “design thinking.” I was confused about how it was different from the work I had done as a “business” expert, and I didn’t really understand it or how it was different from being a designer. The analogy of ‘I think therefore I am’ came to mind, and when applied to design thinking, I got, ‘I design therefore I am a design thinker.’ It seemed obvious to me that designers are taught ‘designerly’ ways of approaching business challenges, and the natural result of practicing design is to improve business outcomes and make more money. Why else would designers practice their craft—same as business people, right?

What I quickly learned is that designers often believe themselves to be the keepers of the keys to solving “wicked problems” and they use a “design-thinking” approach to solve them. These wicked problems can be business related with the intent of making money; or, they can be social or economic problems where the intent is to do “greater good.” Regardless, it became clear that the design-thinking approach contains specific tools and core competencies that are used to solve these wicked problems.

I found myself asking the question, “What are these design-thinking tools and core competencies, and what value do they bring to an organization that practices using them?” And, I found myself seeking better answers to the questions, “Is ‘design thinking’ the same as a ‘design-driven’ culture? ‘Is design thinking unique to designers, and can only designers competently practice design thinking? “What does it mean when we use the word ‘design’ versus the word ‘innovation’ and ‘how do organizations delineate between design and innovation; and where do they overlap?”

Primary Research

With the full support of the Design Management Institute (DMI), headed by Michael Westcott, president of DMI, I set about to answer these questions. We undertook two significant research projects from March to
October 2013. The first project—Design Value—was focused on Booz & Company’s Top 10 Most Innovative Companies and world leading design and innovation consulting companies. The purpose of the work is to define a collection of design-metric methods and tools, a shared design-metric vocabulary, and recommend processes and methodologies for developing and using design metrics. I worked on the core team led by Michael Westcott that included Rob Wallace, managing partner at Wallace Church & Co; Steve Sato, principal at Sato and Partners; Deborah Mrazek, principal at DMMN Tech LLC; Carole Bilson, president at Strategic Change & Innovation; and Surya Vanka, director of user experience at Microsoft. I partnered with Rob Wallace to execute a research study to define design thinking, the tools and core competencies. We conducted 15 one-on-one interviews with the senior designers at 3M, Cisco, ConAgra, GE Healthcare, IBM, Intuit, Microsoft, Nike, P&G, Samsung and Toyota. We also published an online survey that was distributed to the DMI and IDSA members. This survey received more than 150 responses, and the insights were incorporated into feedback from the personal interviews.

One of the first outcomes of this research project is the development of two value assessment models published in the paper, *The DMI Design Value Spectrum: A New Framework for Measuring, Identifying and Growing the Value of Design in Business* (DMI:Review, 2014). The paper outlines two models that were developed from this effort: Measuring Design and Design Value Scorecard. The models were tested at the DMI conference in Boston in October, and the paper was published by DMI in December 2013. The Measuring Design model is used to evaluate how and where design creates value in an organization. It starts by evaluating the desired business results and design’s role in delivering those results, considers the specific design activities to identify the metrics that should be tracked to determine how they can be tracked, and finally guides the development of the metrics system. The Design Value Scorecard model is used to identify the organization’s level of design maturity across three functional areas: development and delivery, organization and strategy. As design’s utility moves from aesthetics and functionality into experience-driven integration and business modeling, design capabilities have a broader influence and impact on the business at
large. These three zones—tactical value, organizational value and strategic value—reflect how best practice organizations utilize design to drive business value. The tactical value zone evaluates and measures how design is involved in aesthetic and functional development, as well as the delivery of products, services and communications. The organizational value zone evaluates and measures design’s influence on metrics such as conversion, lifetime customer value, brand loyalty, and market share. And, the strategic value zone measures larger metrics such as profit margins and stock performance.

The paper also publishes four key insights from the interviews with the Top 10 Innovators. First, they all deploy a center of excellence to define vocabulary, practices and training for the organization. Second, they all cite advocacy from senior leadership and a focus on design, innovation and development as key to design’s influence and success. Third, there is consistency in design’s evolution and progression within organizations across industries. And, fourth, a user-centered approach to innovation drives design’s evolution and streamlines the organizational structure and improves the performance of the entire organization.

The second research project—FuturEd—was designed to assess how design practitioners, students and academicians at MBA schools and schools of design define design and design thinking, and to understand how design thinking is actively being incorporated into their programs. For this research project, I also worked on the core team led by Michael Westcott, heading up the primary research and analysis. The team included Craig Vogel, associate dean, University of Cincinnati, College of Design, Art, Architecture and Planning, president of the Live Well Collaborative, and co-author of Creating Breakthrough Products; Heather Fraser, founder & CEO, Vuka Innovation Inc., adjunct professor of Business Design at the University of Toronto; and Amy Chong, MBA candidate at the University of Toronto. We conducted 15 formal, in-depth one-on-one interviews with senior designers, educators, consultants and students at 3M, Intuit, Phillips, Microsoft, Pepsi Co., 3M, Nike, Continuum Innovation, frog Design, ThoughtFormDesign, Wallace Church & Co., UC Berkley, California College of the Arts, Austin Center for Design, and Thomas J. Watson Foundation, Yale, Harvard, University of Cincinnati and University of Toronto. In addition, we
conducted more than 50 informal discussions with thought leaders, incorporating their insights into the body of research knowledge. Finally, we also published an online survey that was distributed to DMI and IDSA members, for which we received more than 150 responses. We analyzed and coded the individual data sets, merging the trends and insights into a consolidated data pool. In August 2013, DMI held a FuturED design symposium to present initial research findings and extend the dialogue in real time with the participants. The conference brought together 75 representatives from business, design, and education in a series of facilitated conversations. Four key insights from the interview based research are: 1) there are eight dominant cognitive thinking models that are key design core competencies (Critical, Concrete/Abstract, Divergent/Convergent, Strategic, Abductive, Systems, Innovative, Perspectival/Framing); 2) design is founded on highly developed make skills, 3) designers are required to have highly developed leadership competencies and an articulated vision to fulfill the collaborative, change agent role; and 4) the primary reason designers do what they do is to create empathic emotional connections with others. Chapter 4 outlines this research in more detail, but in sum, industry’s overview of the “ideal designer” is a graduate who possesses a broad range of business, leadership and “make” skills (deep capabilities to aesthetically visualize, prototype and model).

Broadly in the research, when we asked each subgroup to specifically define design, we got a range of explanations from each segment of respondents. Industry vocalized that they need people who deeply understand and know how to apply the design process as a toolkit for collaboration. Repeatedly, the core principle enabling this deep understanding in the design (thinking) process is empathy. This is consistent with the one-on-one and online survey research results. The conversation at the conference turned into a heated discussion about the definition of empathy—which boiled down to the ability to relate and understand another human’s perception of his or her own personal value—and whether empathy can actually be taught or if it is an innate emotional capability that you have or not. Regardless of this question, it was clear that, in industry, empathy is a key core principle of design research and is required to get to the core values of groups and (sub) cultures.
The students who were interviewed for this research told us they perceive design as “bringing form to ideas.” They view the verb “design” as the *craft* aspect of the field that has been traditionally taught in design schools worldwide and is the understanding and mastery of the art of visualizing, modeling, and communicating a spectrum of emotional and functional attributes and performance requirements that bring life to things.

The educators we interviewed made a distinction between the undergraduate and graduate settings, explaining that the focus of undergraduate design education is on teaching the art of the craft combined with the science of the research to actualize something, usually an object. The focus of graduate design education is about extending that teaching by focusing on how designers integrate, blend, work across multiple disciplines in leadership ways to move an idea forward. This level of education emphasizes the ability to think in a variety of different ways: to develop different ideas, business models and organizational cultures using alternative thought processes and approaches. The “things” that are the focus of these design studies have been elevated from objects to ideas, from how something is constructed and works, to what it means and how it connects with humans to create new solutions.

When we asked respondents to share their definition of design thinking, the core principles and practices associated with design thinking, and their thoughts about the role and value of design in an organization, again I got a range of explanations. The students I talked to defined “design thinking” as a process to tackle challenges. They believe that both concepts—“design” and “design thinking”—share many of the same fundamental principles including people-user centered-human perspective. For them, design thinking is a core process to be mastered in graduate education, which will refine their ability to create and implement holistic, innovative and effective solutions after graduation.

Businesses positioned design thinking as the ability to integrate the emotive thinking—a structured approach to learning by taking action to create an understanding of another person’s point of view—and cognitive thinking—using eight repetitively referenced structured approaches to learning—to identify insights, create
new ideas, model, visualize and iterate based on consumer feedback. The results produce higher-value products and services that get to market in shorter development cycles.

Educators positioned the idea of design thinking by suggesting that teaching and learning design-thinking processes and developing design-thinking skills is critical to graduating candidates who are qualified and competent for the roles they will have after graduation.

The Literature Review

Concurrent to the primary research, I turned to the literature to better understand the definition of design, design thinking and innovation, starting with Herbert Simon, who is often credited with positioning the definition of modern design in his book, The Sciences of the Artificial (Simon, 1969). In this work, Simon defines the study of design as the ‘science of the artificial’, which is “knowledge about artificial objects and phenomena” that are “man-made, as opposed to natural” (pp. 4-5). Simply put, he is referring to “an artifact.” Artifacts can be thought of as a meeting point between an “inner environment, the substance and organization of the artifact itself, and an “outer” environment, the surrounding in which it operates. If the inner environment is appropriate to the outer environment, or vice versa, the artifact will serve its intended purpose” (pp. 6-7). Simon continues the discussion by arguing that humans are actually quite simple behavior systems, and it is the complexity of their environment that drives complexity in behavior and ultimately adaptation. The science disciplines teach how natural things are and how they work; and the engineering disciplines teach how to make and design artifacts that have desired properties. He further expands the ownership of design from engineers to “Everyone designs who devises courses of action aimed at changing existing situations into preferred ones. Design, so construed, is the core of all professional training; it is the principal mark that distinguishes the professions from the sciences” (pp. 55-56). Design… is concerned with how things ought to be, with devising artifacts to attain goals” (p. 59). By using a “modest adaptation of ordinary declarative logic” the designer can “first consider all the possible worlds that meet the constraints of the outer environment; then find the particular world in the set that meets the remaining constraints of the
goal and maximize the utility function” (p. 62). It is the set that maximizes the utility function that presents the optimum outcome.

Simon is saying that designers are students of the science of the artificial, taught to understand artifacts as they function in their environment and to determine if the artifact’s existing function is meeting the needs of the interaction. The interaction is the experience that the person using the artifact has with it, and the designer’s objective is to determine the appropriateness or adequacy of the interaction. If the artifact is not working, i.e. it is not meeting the needs of the individual, then this gap is the opportunity space for change—it is an opportunity to design a preferred outcome. In sum, to design is to logically understand how to devise a new interaction that optimizes the outcome. In other words, create connections with people to understand interactions with environments.

Next, I turned to the design-thinking literature. One cannot do an exploration of the idea behind design thinking without reading Tim Brown at IDEO. Although he was not the first, nor is he the only, prolific designer to talk about the notion of design thinking, he has been very instrumental in creating the current platform for discussing and bringing attention to the idea. In addition to the definitions I provided in Chapter 1, Brown positions design thinking as “a system that uses the designer’s sensibility and methods to match peoples’ needs with what is technologically feasible and what a viable business can convert into consumer value and market opportunity” (dmi:review, 2013). From his body of work, it is clear that the customer-centric research skills and the body of aesthetic skills that designers develop through formal education processes are most powerful when combined with a solid business acumen, the combination of which is incorporated into his teachings about design thinking.

I spent extensive time with Craig Vogel, the mentor and chair of my thesis committee. I reviewed his printed works and enjoyed challenging discussions (2014) about the value of design, design thinking, and what makes a design-driven organization. Much of the work in this material is a result of our active dialogue that builds
on each other’s unique perspectives and understanding of business and design. In his printed work and in our discussions, Vogel talks about design thinking as “the appropriate blend of qualitative and quantitative thinking with the goal to produce positive change that responds to the needs of consumers” (Vogel, 2014). The process produces “comprehensive visualizations of future alternatives,” (Vogel, 2014) allowing for interaction and feedback from stakeholders early in the process and reducing the potential of unintended consequences. It is inherently interdisciplinary and helps companies and culture evolve thoughtfully blending continuity and change” (dmi:review, 2013). As we talked, we discussed the unique value that designers and design thinking brings to business that differentiates them from formally trained business students or engineers. We talked about how designers are taught to, see the world and express ideas through the comprehensive visualizations of future alternatives (Vogel, 2014), which is a fundamental aspect of creating value that is discussed in his work with Cagan: “the combination of style and technology create breakthrough products that meet the needs, wants and desires of customers and resulting in increased sales, profit, and brand equity” (Cagan and Vogel, 2002). This involves seeing and perceiving the world using both cognitive thinking and empathic emotional thought processes. We acknowledge that there are two primary ways that designers are cognitively empathic. First, designers are culturally aware and act as culture filters focused on listening and spotting signals and changes and are passionate about caring for the human condition. Second, designers are highly skilled at translating this awareness into ideas and visualizations, and they are also passionate about these rigorous processes. Designers are taught how to combine both perspectives to generate artifacts (products, services, interactions and systems) that are actually meaningful to individuals. It is this broad approach that differentiates design from business and engineering, both of which are fields that often take a narrower, more scientifically based approach to problem exploration (Vogel, 2014).

Richard Buchanan (1992), a previous colleague of Vogel’s and professor of design, management, and information systems at Weatherhead School of Management at Case Western University, and widely published author and frequent speaker, offers other valuable insights into the value that design brings to an
organization that are relevant to understanding the role of design in an organization and in society. He positions design as the “discipline of practical reasoning and argumentation directed by the individual designer toward one or another of its major thematic variations in the twentieth century: design as communication, construction, strategic planning, or systemic integration.” He defines four areas in which design is explored:

“1) Symbolic and visual communications—communicating information, ideas and arguments through a new synthesis of words and images; 2) material objects—the concern for the form and visual appearance; 3) activities and organized services—exploration of how better design thinking can contribute to achieving an organic flow of experience in concrete situations, experiences more intelligent, meaningful, and satisfying; connections and consequences; and 4) complex systems or environments for living, working, playing and learning—the role of design in sustaining, developing and integrating human beings into broader ecological and cultural environments” (pp. 9-10).

He further argues that design is a synthesis of three arguments: 1) ideas about products—“industrial design tends to stress what is possible;” 2) operational logic of products—“engineering tends to stress what is necessary;” and 3) humans’ use of products that reflects personal and social values—“marketing ends to stress what is contingent in the changing attitudes and preferences of potential users” (p. 20). From this, it could be said that the value of design comes from the designer’s ability to synthesize (one of the eight core cognitive-thinking processes identified in the research) these three lines of reasoning into an integrated argument about the ‘nature of the artificial’ in human experience. Design thinking provides a “common basis for reflection” (p. 20) and is the process of creating an integrated argument.

Synthesizing the key ideas of design from Simon, Vogel and Buchanan, design is the structured cognitive and empathic search for opportunity gaps—places where interactions with an artifact are not meeting the needs of the human using it—and the structured use of cognitive-thinking processes and iterative development of alternative solutions that result in the creation of an optimal solution. Design thinking is the application of a
integrative set of human-centered, creative problem-solving strategies and tools, the core of which are empathic research strategies, to create a deep understanding of people and their interactions with artifacts and each other to determine how to devise a new interaction that optimizes an outcome.

**What Is Innovation and How Does it Relate to Design?**

Peter Drucker, a writer, professor, management consultant and self-described “social ecologist,” was a man who was often hailed as the man who invented management. He spent his career exploring the way human beings organize and interact, much the way an ecologist would observe and analyze the biological world. In his book, *Innovation and Entrepreneurship* (Drucker, 1985) Drucker defines systematic innovation as “the search for and the exploitation of new opportunities for satisfying human wants and human needs” (p. 30). Innovation is the “specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service” (p. 35). He positions the role of the entrepreneur as one to “search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successful innovation” (p. 35). Their job is to “…create something new, something different; they change or transmute values” (p. 37). He goes on to say “Entrepreneurship rests on a theory of economy and society. The theory sees change as normal and indeed as healthy. And it sees the major task in society—and especially in the economy—as doing something different rather than doing better what is already being done” (p. 41). Innovation is “the act that endows resources with a new capacity to create wealth. … There is no greater resource in an economy than ‘purchasing power.’ But purchasing power is the creation of the innovating entrepreneur” (p. 45). He argues that “systematic innovation therefore consists in the purposeful and organized search for changes and in the systematic analysis of the opportunities such changes might offer for economic or social innovation. What the innovator sees and learns has to be subjected to rigorous logical analysis. …The analysis, with all its rigor—its requirement for testing, piloting and evaluating—has to be based on a perception of change, of opportunity, of the new realities, of the incongruity between what most people still are quite sure is the reality and what has actually become a new reality”
This requires the willingness to say: “I don’t know enough to analyze, but I shall find out. I’ll go out, look around, ask questions, and listen” (emphasis added) (p. 65.) He believed that successful innovators use both the right side and the left side of their brains. They look at figures, and they look at people. They work out analytically what the innovation has to be to satisfy an opportunity. And then they look at the customers, the users, to see what their expectations, their values, their needs are.

To summarize Drucker’s key points, we see that he positions entrepreneurs as the people who learn and develop the skill of innovation. Innovation is the use of a set of systematic innovation tools and core competencies that enable the entrepreneur to seek evidence of cultural and social change to identify opportunity gaps and develop solutions that address the gaps by directly engaging with the people who are impacted by the change. The result is the creation of new meaningful, economic resources that create financial value and wealth. What does systematic innovation look like?

Fast-forward almost 30 years from Drucker’s publication of Innovation and Design to the launch of the 2013 book Inside the Box: A Proven System of Creativity for Breakthrough Results (Boyd and Goldenberg, 2013). Jacob Goldenberg—marketing professor at the Interdisciplinary Center in Herzliya and a visiting professor at Columbia University—and Drew Boyd—speaker, blogger, executive director of the master of science in marketing program and assistant professor of marketing and innovation at the University of Cincinnati—argue that there are four key principles to systematic innovation, and that throughout history, the best innovations have followed one of five patterns for generating new ideas. The four principles include: 1) working within the closed world—the space that provides resources at close hand; 2) form follows function—people are better at searching for benefits than they are at finding the best configuration for a given benefit; 3) fixedness—the tendency to see objects only in traditional ways or uses—gets in the way of change; and 4) constraints enhance creativity by limiting the number of variables under consideration. Given these principles, breakthrough innovations can be generated using the five Systematic Inventive Thinking (SIT) innovation techniques—subtraction, division, task unification, multiplication and attribute dependency. Each technique
employs a structured thinking process that generates opportunity gaps and then solves them in unique ways. The results are powerful new innovations. In a conversation with Boyd (2014) about the use of this technique, he shared his experience that time and again the application of this technique yields unique, insightful and breakthrough ideas. And he adds that in the few instances he has experienced firsthand when the idea is combined with the power of designers, the end solution is often unexpectedly innovative.

The Relationship Between Design and Innovation

So, how does innovation play in the sandbox with design? Lots of designers, design firms, and design thought leaders talk about innovation and design almost inseparably. Some use the words interchangeably; and some designers do not use the design label but refer to their work as innovation and to themselves as innovators.

When you consider Simon’s and Drucker’s arguments together they suggest that designers are instigators and masterminds of change, as are entrepreneurs, both considering similar sources to identify a change and the subsequent opportunity gaps. Entrepreneurs are to the field of innovation as designers are to the field of design. Design is the practice of change by “changing an existing situation into a desired situation” (Simon, 1969). And innovation is the practice of change by “purposeful and organized search for changes, and in the systematic analysis of the opportunities such changes might offer for economic or social innovation” (Drucker, 1985).

And, looking at Vogel, Buchanan and Boyd’s representation of design and innovation, we see that both practices are founded on the structured search for opportunity gaps—places where interactions with an artifact are not meeting the needs of the human using it—and the structured use of cognitive thinking processes and iterative development of alternative solutions that result in the creation of an optimal solution. The difference in the approach is the level of engagement at different points in the process of connecting with the human condition.
Using logic, one can extrapolate that the terms design, innovation, designers and entrepreneurs can be used interchangeably. And, as I’ve pointed out, they often are used this way. Many design firms brand themselves as innovators, and many business management experts brand themselves designers and/or design thinkers.

But are they the same? Not really.

Following Simon’s thought process, Designers are ‘artificial scientists,’ taught to be culturally aware and to act as culture filters, seeing the world and expressing ideas through the art and skill of exploration, visualization and iteration. As design has evolved, the ability to create connections to identify value—based insights has become important. It is this broad approach that differentiates design from business and engineering, both of which are fields that often take a narrow, very scientifically based approach to problem exploration.

Synthesizing Drucker’s definition, entrepreneurs are management scientists, who are taught the professional skills and practices of innovation, focusing heavily on management policies and practices that do three things: 1) create an organizational culture of innovation—one that is willing to perceive change as an opportunity rather than a threat; 2) regularly and methodically evaluate a company’s performance as entrepreneurs and innovators and subsequent process improvements; and 3) development of an organizational structure, from staffing and managing to compensation, incentives and rewards, that supports a culture of innovation.

Buchanan (1992) extends both of these ideas by positioning design, business and engineering practitioners as design thinkers with different perspectives saying, “Industrial design, engineering and marketing each employ the discipline of design thinking, yet their arguments are often framed in sharply different logical modalities. Industrial design tends to stress what is possible in the conception and planning of products; engineering tends to stress what is necessary in considering materials, mechanisms, structure and systems; while marketing tends to stress what is contingent in the changing attitudes and preferences of potential users” (p. 20).
The tool sets that designers and entrepreneurs each use during the research and creative processes—design thinking and systematic inventive thinking—are complementary and produce new ideas, each taking a different approach to the timing and the role of the consumer. As entrepreneurs and designers work together to apply these techniques at the fuzzy front end of the continuum, eventually their role diverges synergistically. It becomes the designer’s job to create connections and translate and communicate ‘ideas’ into visual representations of an artifact. This effort is founded on cultural insights and knowledge of aesthetics, systems and technology. They also serve the key role of facilitating multidisciplinary collaboration throughout the organization to create economic value and holistic customer experiences. I argue that it is this translation of the cultural research into meaningful artifacts and holistic systems where The Sempathy Continuum Model plays a key role in understanding the design literacy of an organization. Concurrently, it is the entrepreneur’s job to systematically evaluate opportunities and push forth through business management practices those ideas with the highest merit that will create the biggest economic value.

Design and innovation activities converge again as the organization works to develop, launch and sell the artifact in market. These activities create a constant state of conflict within an organization as the innovation and design processes seek to implement changes that intersect with operational processes, which are inherently designed to minimize change, optimize processes, and create consistency and predictability to ensure high-quality outputs. Again, The Sempathy Continuum Model is key to understanding the organization’s design literacy and determining whether it can effectively accept this constant state of conflict as a positive rather than a negative and to holistically integrate design into operational management to deliver products and experiences that consumers will embrace.

In theory, the terms design and innovation could be used interchangeably but in practice each brings a different, yet complementary, skill set. The power comes from their complementary implementation and integration of change into the organization.
Defining a Design-Driven Organization

As we move from Simon and Drucker’s definitions, which were developed during a time of industrial revolution where mass production and scale were dominant, to today’s revolution of the service industry, the role and influence of design is changing again. As we talk, Michael Westcott (2014) describes the current mandate of design by saying that “Design plays the change agent role to help shift the organization from the 20th century industrialist, mass-manufacturing economy to the 21st century relationship based, mass customization economy, which fundamentally uses new ways to find and address ideas. The role of design, and the work of designers, is to break down silos and build connections where none previously existed; to reengineering massive organizations and behaviors to enable a culture that is flexible and mass customizable.”

We see further evidence of this evolving position in Patrick Whitney’s work. Whitney, dean of the Institute of Design at the Illinois Institute of Technology, describes a design-driven philosophy in today’s time as:

“We live in a time of a changing economic model: one from an economy of scale to an economy of choice where personalization and individuality prevail. As digital integration blurs the lines between all areas of our lives—work, family, play and shopping—people derive meaning from the objects and systems they interact with in different ways. Companies that operate with a design-driven philosophy seek to understand these changing needs and can successfully derive insights and create visions of situations and environments that don’t yet exist, can respond to the needs and desires of people, instead of trying to predict them, and can bring them to life using the core skills of design—excellent styling and user centered systems” (2014).

For the purposes of this paper, I define a design-driven organization as one where design and design thinking have moved to the center of the organization and influence the development of the business with a customer-centric approach. It is an organization that understands the influence of an individual’s total experiences with the company and its products, and is focused on discovering inventive ways to identify and address an individual’s articulated and unarticulated needs. It is an organization that has the ability to think in a range of
emotional as well as intellectual ways and is guided by extensive emotional and cognitive research strategies, progressive tools and rigorous processes that are designed to find the broad, customer-centric value application of an idea. This philosophical approach not only transforms customer’s lives but also the business itself along with the people who work in the business as well as global economic health.

Is a Design-Thinking Organization a Design-Driven Organization?
Is design driven the same as design thinking? I argue it is not. Design driven is an organizational philosophy, and design thinking, as a verb, is a holistic approach to research and production that is a necessary part of the philosophy. Design-thinking tools can be applied to a variety of problems by formally trained designers or by skilled non-designers, but being a design-driven driven organization requires a cultural, philosophical and empathic maturity associated with finding new and meaningful ways to care for the human condition. It positions design-thinking principles and core competencies as a fundamental part of a human-centric organization, and these skills are developed and compensated within the same evaluation processes as other job performance criteria. It requires designers to hold strategic positions on the senior leadership team and throughout the organization, representing a variety of design subspecialties and competencies; and it requires consciously acknowledging that high levels of experimentation and validation actually mitigate risk and produce better long-term, meaningful outcomes that drive revenues and market value. It requires the emotional competence to care deeply about all elements of good design: aesthetics and function, technology and sustainability, process and tools, for humans, systems, and cultures.

We see evidence that the focus of design thinking is expanding as IDEO inserts the role of empathy in its teachings. In brief design-thinking training sessions, IDEO maintains it can teach you how to be a design thinker, a role it extends to being an empathic thinker. I think this is a big claim in a short period of time—one that could be examined in detail in another paper. Yet, I agree that expanding awareness and training about design thinking and empathy is very valuable. You see, to do “design thinking,” you have to know what it is; to know what it is, you have to experience it; and from experiencing it, you can understand what you are
individually and collaboratively capable of producing. Therefore, I agree—take a class and learn the design-thinking fundamentals and continue to integrate good design practices into your organization. When you look for the starting point for this design-thinking integration, consider applying these principles to the innovation chasm, a point at which designers bring extensive value.

**Design Value: Bridging the Innovation Chasm**

As discussed, there is an entire field of management science associated with the practice of innovation just as there is an entire field of social and perceptual science—or artificial science—associated with the practice of design. Many of the skills and activities overlap, while many are distinct and unique. Many organizations formally develop and implement innovation and/or design capabilities to varying degrees and to the priority of organizational or cultural integration. The most successful organizations are those that understand and take advantage of an organizational philosophy I will call the Innovation Design Continuum and present visually in Figure 1.

![Innovation-Design Continuum](image)

**Figure 1: Innovation-Design Continuum**

Historically, innovation teams, departments and activities have been focused on cognitive and research activities, developing new technologies, and/or new ways to utilize technologies. Both entrepreneurs and designers have successfully contributed to these activities. Many profitable companies have figured out how to effectively bring to market these innovations. They have led industries and generated enormous profits from these innovation activities. They have figured out how to take an idea to market, quickly move it along the
product development bell curve, engage the innovators and early adopter market segments, and how to move into the broader early majority market segment. This innovation—product development bell curve—is articulated by Geoffrey Moore (2002) in his work “Crossing the Chasm” and presented in figure 2.

Figure 2: Innovation-Product Development Bell Curve

As a company launches its product and has initial success from Innovators and Early Adopters, it causes a disruption in current markets. The challenge is that this is a small segment of the mass market. Extending the initial disruption into the mass market by creating mass demand and sustainable growth, presents a substantial gap to overcome, one that requires an in depth understanding of the consumer’s motivations. Once this gap is crossed, the company’s ability to continue product penetration and adoption through the life cycle requires a focus on understanding how the consumer’s motivations continue to change. In the past, this cycle could take years. This is a key value proposition for design, and it is the critical point at which innovation and design begin to ebb and flow along the continuum. There are endless examples of solid innovation ideas that are market failures because corporations lacked the skill sets necessary to bridge this chasm between early adopters and early followers. The ability to evaluate and understand these transition points is one of design’s strengths.
Henry Chesbrough alludes to this chasm in his book, “Open Innovation. The New Imperative for Creating and Profiting from Technology” (Chesbrough, 2003). He defines a paradigm shift from Closed Innovation—a cognitive and research cycle of investing and developing new ideas within the organization—to Open Innovation—a cognitive cycle that acknowledges the value of using internal and external ideas and paths to market. This shift occurred because although closed innovation strategies generated valuable and insightful ideas, companies were not always capable of producing commercial products and services. The ideas may have been brilliant but the output was not useful. As a result, the ideas themselves were abandoned or sold to other companies that are successfully able to translate the idea into valuable products. The Open Innovation model acknowledges the need to leverage internal and external ideas and resources to create value from an idea. This could occur in the form of new start-up companies owned by the originating firm or by moving ideas generated outside of the firm into the business model, both of which enable a firm to capitalize on innovation in a value-oriented way. Chesbrough’s work cites numerous examples supporting this idea. What is relevant to this argument is that the concept of Open Innovation is focused on developing the broader value application of the idea based on the needs or interests of the customer—crossing the chasm—and is grounded in the business model used to bring it to market—integrating internal and external resources to develop meaningful solutions. This business model ties back to Booz & Company’s argument that “needs seeker” innovation strategies and business models are most successful, and my argument that these companies maintain a design-driven culture—one that seeks, finds and develops the broad customer-centric value application of an idea and is successfully able to bridge the chasm from early adopters into early followers and continue on the life cycle curve. This design-driven philosophy enables them to bridge the chasm, if not overcome it at launch and shortens the adoption curve from years to months. Referring again to Tom Wujec, he summarizes this idea nicely in the book Imagine Design Create (Wujec, 2011). He says, “Design is the bridge between invention and innovation” (p. 33). And I argue it is a key bridge over the innovation gap.
The Sempathy Continuum Model

The underlying question is how do these companies create and maintain a design-driven culture that enables them to bridge this innovation chasm and sustain an environment of deep customer knowledge and actionable insights? The answer comes back to the range of empathic thinking as a core design principle.

The results of the DMI research overwhelmingly positioned empathy as an important core competency for designers and design thinking processes. Empathic thinking is the ability for individuals and, collectively, organizations to deeply and powerfully connect with, and care for, other humans, and I argue also with materials and processes. Terms like “empathic visualization” or “transcendent awareness” show that humans can move beyond the knowledge of a subject matter to an intuitive connection that produces outcomes beyond what is experienced by a person with functional literacy. Empathic thinking is the opposite of objective quantitative thinking—dominant in engineering and marketing and other ‘sciences’—which is intended to rigorously stay in a neutral, evaluative zone.

For example, there are people who are very good at empathic drawing, where the person moves beyond the functional knowledge of sketching into an empathic understanding of the subject as well as the materials and media being used to create the sketch. Pratt Institute teaches an empathic drawing class, and the syllabus defines the term as, “[Work that] conveys the emotion and totality of a group of marks that many other techniques lack. The success of almost all products or places that are designed is dependent on cultivating an emotional response from the user. The empathic drawing technique helps to communicate this vital human need. The idea is to create a sensibility between ideas and expressive tools and materials that enables the development and visualization of innovations that are grounded in emotional instincts” (Syllabus: 2009).

The power of the ideas—the sketch—comes when the designer uses emotion to mesh with the media and the result is powerfully unexpected. The same is true for other design crafts, for example, woodworking. There are people who are empathic at working with and manipulating the wood in that they create artifacts that move
The designer has an emphatic sensibility of both the material and the aesthetics that communicate the essence of the piece. The sensibility of the designer and the emotion that these types of pieces invoke in the viewer are intuitively powerful, regardless of the level of training the viewer has. This consideration of empathy can be applied to any profession and craft and is often held in high esteem as “good design.” This again warrants the exploration of the question, “What is good design?”

John Heskett, previously the chair professor at the School of Design of the Hong Kong Polytechnic University and a 15-year professor at Institute of Design at Illinois Institute of Technology, defines good design by stating “Design is to design a design to produce a design,” continuing in his work to define design as both a verb—a condition or action—and a noun—a general concept, strategy or policy; a plan or intention for implementation, and the finished outcome” (Heskett, 2005). The acknowledgement of the verb and noun definitions is key but still short on identifying the criteria for evaluating good design.

Tom Wujec (2011) suggests that design is “the urge to re-imagine, reorder, and reshape,” (p. 27) and that good design is multifaceted—also having both a verb definition—the movement and purpose to envision, to plan, to construct, to improve—and a noun definition—the focus on the made object’s looks and performance. He goes on to say, “Good design can simultaneously refer to: 1) general practice; 2) an action; 3) a plan; or 4) a finished product” (p. 27). He positions the changing role of good design as

“[Design that] fully lives up to that label only when people actually engage with the design and discover that ‘it works beautifully’ or ‘it just feels right.’ It must be thoughtful. It must consider, anticipate and analyze as never before, taking into account multiple viewpoints and human needs. It must leverage integrative thinking and a mindset that seeks connections and the big picture as well as collaboration between people and disciplines. And, it must anticipate issues and address them” (p. 27).

This is consistent with other work discussing good design, but the difference is that this work publishes ten Essential Elements of Design (Wujec, 2011) formally listing and defining comprehensive criteria for good
design, categorizing the qualities of good design with both verb and noun attributes. The model is presented in figure 3 below.

**Figure 3: Elements of Good Design**

In addition to these elements, I think it is important to integrate the multiple levels of design that Buchanan (1992) outlines, referring again to the four levels of design: 1) communication; 2) materials; 3) strategic planning (activities and organized services); and 4) systemic integration (connections and consequences; the balance of functioning, whole, complex systems for living, working, playing and learning (Buchanan, 1992).
While Wujec’s model visually accounts for the first two levels from Buchanan’s work, I include two more icons to the model to represent Buchanan’s third and fourth levels—strategic planning and systemic integration. For the purposes of this paper, good design is defined as achieving and maintaining high levels of sensibility and caring about the physical and emotional meaning of an object, synthesizing the contributions of design, engineering and marketing within the context of complex, human systems.

Returning to my earlier example about empathic thinking and visualization, I ask, “If you want to be a woodworker, what level of woodworker would you want to be? One who is merely familiar with the basics and can create an object that satisfies a simple objective? Or one who fully embraces the craft, learns the nuances and finesses of the tools, materials and processes to develop intuitions and a higher-level sensibility for your work?” The same question can be applied design thinking, to design-driven organizations, and to empathy. To what extent do you want to be empathic or create a design-driven organization? If you want to be empathic—either with a process or with humans—you have to understand where you are starting. You have to understand how much you are willing to extend to achieve a deep understanding of others and their experiences. And you have to understand what level of change you are willing to undertake to accomplish this new level of empathy.

Entire organizations or teams need not be full of extensibly empathic people. In fact, the more diverse the team is emotionally, the better. Look at the relationship of Captain Kirk and Spock in Star Trek or the characters in the television show Bones. In both examples, each team member plays a different role on the team and has a complementary range of emotional capabilities that brings a unique tension to the stories. This range establishes the idea behind The Empathy Continuum Model, and when applied to organizations, we recognize that not everybody is—or wants to be—empathic. Individuals, and therefore organizations, possess different functional abilities to connect with other people—to care—and to leverage the elements of good design. This is where design excels, and I argue, it is the core of a design-driven organization; the ability to use a range of qualitative and quantitative empathy to listen in order to understand
and articulate cultural change(s) and personal value(s) that inspires new idea(s) and insights. These organizations then apply different levels of sensibilities to communications, materials, people and situations, and systems. I argue that the range of perspectives generated by a team with varying empathic positions provides alternative insights and dialogues that encourage reframing, explorations and new research tracks that positively influence collaborative cognitive thinking efforts. This generates understandings that would be illusive without diversity. It stimulates and inspires new ideas, visualizations, prototypes and models that address the broader, value-based application of the idea to create disruptive innovations. From these ideas emerges a model that seeks to create a framework for evaluating the design sensibility of an organization—

*The Sempathy Continuum Model.*

![Figure 4: The Sempathy Continuum Model](image)
The Sempathy Continuum Model (SCM) can be used to evaluate an individual or organization’s emotional design sensibilities. The model uses a range of emotional states as a measurement scale. It starts with ignorance, then moves to awareness, interest, sympathy, understanding, to compassion, and finally into empathy—or a position of truly caring for another human. I will define each position on the scale, how it relates to an organization, the activities of design and innovation, and how to assess the organization’s current abilities.

Figure 5: Sempathy Continuum Scale

- **Ignorance:** Merriam-Webster (2014) states “(noun) a lack of knowledge, understanding, or education: the state of being ignorant.” In the SCM, this is a position where the organization is not aware, or does not possess any knowledge to evaluate, that a system is not serving its intended purpose. It also lacks any knowledge of design or innovation fields and practices and the potential they bring.

- **Awareness:** Merriam-Webster (2014) states, “(adjective) knowing that something (such as a situation, condition, or problem) exists.” This is a position in the SCM where the organization may know that some part of its holistic system—internal or external—is not serving its intended purpose. It is aware but, for whatever reason, chose not to address it. A common mantra may be, “If it isn’t broken, don’t fix it.” This is the point in the situation where the opportunity gap has surfaced but there has not been any reaction to it.
• **Interest:** Merriam-Webster (2014) states, “(noun) a feeling of wanting to learn more about something or to be involved in something.” In the SCM, this is a position where the organization begins to react to a situation. An increase in awareness and a response to the current situation shifts the organization into this emotive state. It is the stage at which any touch point in the organization’s holistic system can become a key focus, categorized by any one, or more, of the 12 elements of good design. It may be out of internal interest or curiosity, or it may be because an external factor is putting pressure on the organization. For example, it could be the product’s function and aesthetics; or it could be the online ordering process, or an increasing awareness of using sustainable materials. This is the point at which organizational learning starts and design and innovation processes begin.

From my research, this early “fuzzy front end” is full of ambiguity, complexity and constraints. The organization begins to explore, evaluate and use design tools, including emotional and social quantitative research, including immersion, ethnography, interviews, observations, scenario building, persona construction and other techniques to begin to frame and reframe the issues, boundaries, biases and constraints. To achieve this state, the organization begins to question and evaluate the value and benefits of implementing these strategies and then it begins to select and implement baseline design strategies to learn about the situation.

• **Sympathy:** Merriam-Webster (2014) states, “(noun) the feeling that you care about and are sorry about someone else’s trouble, grief, misfortune, etc.: a sympathetic feeling.” This is the point on the SCM where the organizational desire to “fix it” begins to guide decisions. Again, I posit that this is the point where design core competencies, which from my research, include intellectual thought processes such as divergent/convergent, concrete/abstract, abductive thinking and innovation processes, start to be applied in earnest to the situation as strategies for learning. The goal is to generate ideas and create human centered hypothesis—alternative states—that emotionally as well as quantitatively describe the
environment and provide direction. An organization moves into this position on the SCM when 1) it places a priority on these descriptive, human-centric behaviors, 2) deploys resources to support these activities, and 3) begins to leverage the insights generated from these activities to define strategy, influence products, brand positioning and experiences.

The knowledge and insights generated in the interest state begin to motivate the organization to act, and it could be argued, this corresponds with Wujec’s design element—spark. The organization begins to benefit from early experimentation, prototyping and visualization design cycles that begin to describe and produce alternatives. These design cycles, which include consumer feedback, iteration, modification and learning, create better actualizations of ideas in a shorter time frame, which then reduce risk and have higher resonance and meaning for the intended audience.

It’s unlikely that an organization can focus on developing its empathic position across all 10 elements concurrently. Like design itself, building a design-driven organization is iterative. Ideally, exploration and learning about good design prompts the company to incorporate some level of attention in each area, progressively. I further posit that an organization could chose to stop pursuing or investing any further in any key elements of design, and it most likely would appreciate a stronger market position compared with its starting position. As an organization moves up the SCM, the result of its “good design” efforts is the creation of market value reflected in its brand—as stronger meaning, its products—which may have successfully crossed the innovation chasm; and its consumer experiences—generating more frequent and stronger positive emotional responses. All these benefits influence customer retention and support the organization’s market value.

It is a strategic decision to stop pursuing empathic capabilities at this level. Yet, the value of design extends beyond the balance sheet, form and function. Additional value comes from design when it is recognized as a systemic approach to problems and human experiences and utilized to “create impact”
and as a “tool to empower people” (Wujec, 2011). The point at which an organization understands this role is the point at which it moves into the next empathic state: compassion.

- **Compassion**: Merriam-Webster (2014) states, “(noun) a feeling of wanting to help someone who is sick, hungry, in trouble, etc.” Different than sympathy, the change identified in this level is the motivation with which the organization begins to adopt to drive decisions. Whereas in the previous level, the organization learned about and could relate to a situation, it now becomes motivated to resolve a situation, a significant difference and acknowledgement of empathy’s two stages: recognition and response.

- **Understanding**: Merriam-Webster (2014) states, “(noun) the knowledge and ability to judge a particular situation or subject.” Merriam-Webster (2014) defines judge as “(verb) to form an opinion about (something or someone) after careful thought: to regard (someone) as either good or bad.” My research also indicates that key design core competencies include critical thinking, systems thinking, perspectival/framing and I posit that they represent activities that would position an organization at this level of the SCM. Critical thinking was described as the ability to find problems, question and break constraints, reflect on the process, and make judgments of right and wrong. Systems thinking was described as making unpredictable connections in complex, detailed components of information and understanding the impact of each component on the ecosystem. Perspectival/framing thinking was described as the ability to reframe and examine differently to be able to articulate the perspective of others, exclusive of one’s personal biases, to understand the component’s role in the greater ecosystem. The key words in these descriptions are “judgment of right or wrong,” suggesting a morally based, decision-making position as well as a transition from feelings to action and “ecosystem,” suggesting the recognition of a broader sphere of issues, relationships and impacts of designed change. The use of these difficult and mature thought processes reflects that an organization is motivated from a position of
compassion. And the outputs of these activities create richer solutions that suggest a focus on results and impact. While a significantly different philosophical approach to business, these activities and behaviors still drive financial and market value in terms of brand positioning, product and experiential meaning and deeper emotional responses from intended audiences.

It is important to point out in the positions of sympathy, compassion and understanding that one should recognize that the organization has used its resources to increase its level of knowledge, learning and insights on a deeper, humanistic level. As a result, this deepens its level of caring about humans, societies and cultures. This increased understanding is the rich motivation for holistic, systemic decisions and is the motivation that drives the transition points, ultimately to empathy.

- **Empathy and Caring:** Merriam-Webster (2014) defines empathy as “(noun) the feeling that you understand and share another person’s experiences and emotions: the ability to share someone else’s feelings.” And it defines caring as “(noun) regard coming from desire or esteem.” Although these definitions are helpful, in the model at this level, it is intended to establish that empathy is a position of learning and knowing that results from the actions taken to create a mutual connection, a mutual understanding of another person’s perspective and to work together to improve the condition. This is accomplished from an emotional position that values a philosophical or moral level of recognition, responsibility, capability and action. To that end, we turn to moral theory philosophy for guiding definitions and reference the work ethicists Nel Noddings, Lee L. Jacks professor of education, Emerita, at Stanford University and Michael Slote, UST professor of ethics at University of Miami.

“The moral theory known as ‘the ethics of care’ implies that there is moral significance in the fundamental elements of relationships and dependencies in human life. Normatively, care ethics seeks to maintain relationships by contextualizing and promoting the well-being of care-givers and care-receivers in a network of social relations” (Sander-Staudt, http://www.iep.utm.edu/). In the context of this model,
this shift in direction is intended to acknowledge and extend that the passion designers and design-driven organizations bring to their work is more than just an emotional feeling that causes action(s). It is motivated by a larger obligation to society and cultures to change the outcome and significantly impact the lives of others. In her work, Noddings identified “two parties in a caring relationship—‘one-caring’ and the ‘cared-for’—and affirmed that both parties have some form of obligation to care reciprocally and meet the other morally, although not in the same manner.” She characterized caring as “an act of ‘engrossment’ whereby the one-caring receives the cared-for on their own terms, resisting projection of the self onto the cared-for, and displacing selfish motives in order to act on the behalf of the cared-for.”

Slote (2011) finds in empathy the basis for an ethics of caring that provides the source for moral sentimentalism. Drawing mainly on Hume, with an occasional nod to Smith, Slote shifts the analysis from an evaluation of behavior to the moral worth of agents engaging in action. One’s ability to empathize defines the boundary of the human community or as Slote puts it provides “cement of the moral universe. … Slote argues that empathy provides an “understandable mechanism for moral approval and disapproval” (p. 13-15), lending philosophic rigor to the mere metaphor of moral sense. According to Lou Agusta (Agusta, http://www.iep.utm.edu/emp-symp/), Slote claims to identify a second order of empathy:

In particular, if agents’ actions reflect empathic concern for (the well-being or wishes of) others, empathic beings will feel warmly or tenderly toward them, and such warmth and tenderness empathically reflect the empathic warmth or tenderness of the agents. I want to say that such (in one sense) reflective feeling, such empathy with empathy, also constitutes moral approval, and possibly admiration as well, for agents and/or their actions.”

These perspectives are important to this argument as it establishes a human condition of empathy and caring as a moral commitment—one that we define as “The Care Quotient” (Vogel, 2014). The Care Quotient, applied to design and innovation, is intended to evaluate and acknowledge that a design-driven
organization has created the capability to emotionally and ethically respond to the human condition. It positions an organization at the top of the pyramid (or in the center of the circle or at the highest level of the bar chart), as a design-driven organization focused on identifying and addressing human conditions while creating economic value and growth.

In sum, the range of emotional positions defined in the SCM is important to understanding and describing the idea that creating a design-driven organization is a journey—a process—of moving toward an emotional and ethical connection with the human condition, societies and cultures. It is this connection that enables the translation of insights into meaningful design requirements and artifacts that changes the momentum and, ultimately, quality of life.

The measurement scale components relate to the design process and define a progression of skills, knowledge and emotional awareness that comes from defined design-thinking process steps of research—ideate—refine. The determination of the emotional position of these elements reflects the position in the journey from which design requirements are generated. The scale implies a linear path, but the design process is anything but linear. It is intended to suggest that evidence of using these tools and skills are a good indication of the ability level in each of these areas. Ability ranges from functionally literate (able to use the tool) to capable (skilled in the tool application) to competency (uses the tool autonomically). The reality is that in practice, we could find evidence of a sympathetic organization using compassionate skills. The qualifier is the level of ability and the consistency with which the skills are used in the design process.

With the empathic positions explained, I turn to an examination of the evaluation elements of two existing models: 1) Wujec’s 10 Elements of Good Design (2011); and 2) Buchanan’s four broad areas of design as articulated in the section of Wicked Problems referred to as Doctrine of Placements (1992). These models were selected because the elements can be nicely defined and are understandable and consistent, and they reflect a contemporary and comprehensive evaluation framework. I cite 12 elements for analysis even though there are
10 defined in Wujec’s model and four broad areas in Buchanan’s Doctrine of Placements because Buchanan’s first two broad areas—communication and construction—relate to the aesthetic and function elements defined in Wujec’s model.

- **Aesthetic**—refers to the human perception of beauty, including sight, sound, smell, touch, taste, and movement and includes consideration of color, shape, texture, contrast, form, and balance.

- **Functional**—refers to the outcome (how well) and process (use of principles that produce positive outcomes) of responding to the needs or desires of the people who will use an item in a way that allows their needs or desires to be met.

- **Growth**—refers to the organization’s ability to define and stay true to strategic growth objectives.

- **Sustainable**—refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- **Emotional**—refers to connecting with users on a personal level; establishing a personality that people respond positively to when interacting with the product that leads to sharing and advocating a product with their peers.

- **Spark**—refers to the inspiration that motivates exploration, the human spirit, and the ignition point for creativity (Wujec, 2011).

- **Process**—refers to the design process, encapsulated as holistic thinking, collaboration, design research, iterative use of prototypes, refinement based on feedback, measure of results, and the experience (Wujec, 2011).

- **Tools**—refers to the use of technology to open up new ideas and focus of exploration to generate better ideas, faster (Wujec, 2011).
• Experience—refers to how the organization shapes and orchestrates the six dimensions of experience that are likely to inform the human experience of interacting with the artifact (Wujec, 2011).

• Systems—refers to the integration of emerging technology, the established laws of nature, and inspirational frameworks that result in new design methodologies (Wujec, 2011).

• Community—refers to the activities of organized groups of people bound with common value systems and beliefs (Buchanan, 1992).

• Strategic planning—refers to activities and organized services within communities, including logistics, physical resources, instrumentalities and human beings efficiently used to achieve specific objectives (Buchanan, 1992).

• Systemic integration—refers to connections and consequences: the balance of functioning, whole, complex systems for living, working, playing and learning (Buchanan, 1992).

These components are evaluated and positioned on the scale to reflect the level of skill the individual or organization possesses. The totality of the model is to communicate that good design involves a range of emotional capabilities and connections, held by different people and integrated across organizations. If we argue that a design-driven organization is one where good design moves to the center of the organization and proliferates through processes, experiences and productions, then this means that the organization possesses at least the understanding level, or higher, of emotional awareness factors. Since not every organization can or wants to achieve this level or beyond, the organizational challenge is to understand the desired empathic position, play to its strengths, and develop its functional weaknesses.

The idea of The Care Quotient emerges from my dialogue with Craig Vogel (2014) and extends beyond the range of empathy in an organization. The key idea is to express our belief that designers care about people, process and materials in a very different way than business and engineering sciences, and it is this innate
predisposition or passion for caring for others that creates design value. The Care Quotient idea embraces empathy as well as the kind of passion that John Dewey expresses as ‘art as experience,’ and we all know we love the experience is much as we love the result. It includes a passion for process as well as a passion for materials in the embodiment of a holistic experience of systems and artifacts that inspire an emotional reaction in consumers.

With this notion of The Care Quotient and the Sempathy Continuum Model, I argue that the cumulative value of design is the impact on creating disruptive market conditions that bridge the gap between invention and innovation, accelerate marketing efforts, and drive the key financial metrics that Booz & Company evaluates in its studies—sales, gross profit, operating profit, net profit, historical R&D expenditures, and market capitalization.
Chapter 3: An Exploration Of Booz & Company’s Research

In this chapter, I evaluate Booz & Company’s last four years of work (2010, 2011, 2012 and 2013), examining its innovation argument that the top innovative companies create and stay true to a “needs-seeking” innovation culture. In its work, we see evidence that there is a continuum of the understanding and perceived value about design in global corporations. Very few companies see the value of design as a strategic participant (noun), and many see it is used as a narrow service (verb) and as such, have defined design narrowly to carry out direct instructions for plans developed by marketing and/or engineering. In other companies, design has shifted on the continuum and is more broadly defined, where designers are part of teams (verb) but do not have participation in planning level (noun) activities. At the far end of the spectrum, design is well understood within the company as a key strategic tool (noun), and design is represented at the senior levels of the company as well as integrated throughout the planning and execution process (verb). Booz & Company’s defined integration strategies—Needs Seeker, Market Readers, Technology Drivers respectively—represent evidence of these various design approaches.

Booz & Company’s Methodology

Each year since 2005, Booz & Company has obtained key financial metrics for the top 1,000 companies—sales, gross profit, operating profit, net profit, historical R&D expenditures, and market capitalization. They then rank these companies in order of highest R&D spending and examine their financial results, looking for insights and trends that other companies could use to optimize their innovation investments. To determine each company’s rank position on the list, they index the R&D spending levels and financial performance metrics of each company against the average values in its own industry, then they line them all up. Finally, they code each company into one of nine industry sectors and into one of five regional designations (based on their reported headquarters location) to look for insights related to these variables.
To gather the qualitative data Booz & Company needs to analyze the innovation strategies and capabilities, they conduct an online survey of senior managers and R&D professionals from these 1,000 companies and use statistical methods to understand and gain insights about the most prevalent responses. To gain detailed insights, they conduct personal interviews with select executives. Depending on the year the study was conducted, they have analyzed anywhere from 350 to 800 responses.

In 2010, Booz & Company started tracking the “Top 10 Most Innovative Companies.” To determine which companies make this list, they ask the survey respondents to name the companies they perceive as the world’s most innovative. From these responses, they publish the list.

The 2013 Top 20 Biggest Innovation Spenders

Booz & Company’s latest report (Jaruzelski, Loehr and Holman, 2013) contained the following is a list of Top 10 companies that are the biggest spenders: Volkswagen, Samsung, Roche Holding, Intel, Microsoft, Toyota, Novartis, Merck, Pfizer, and Johnson & Johnson. From this year’s data, they made some interesting observations:

• The top 20 companies were responsible for 25% of the group’s total R&D spending and two-thirds of these companies increased their R&D spending.

• The total R&D spending for all companies on the list rose 5.8% to $638 billion, a $35 billion increase over 2012, while the group’s total revenues only increased by 0.9% to $17.7 trillion.

• R&D intensity—invention spending as a percentage of revenues—rose two-tenths of a percent, reaching the highest R&D intensity level since 2010.

• 89 new companies were added to the list, accounting for more than $16 billion in R&D spending.
• Companies in the Computing and Electronics, Healthcare and Auto industries dominated the top 20, accounting for 65% of overall R&D spending.

• Software and Internet sector is the largest contributor to the growth in R&D spending, adding 10 companies to the list and boosting spending by $9.3 billion—more than any other sector—suggesting additional investment in technologies that run an increasingly digitized world.

• Spending in North America companies outpaced that of companies in Europe and Japan, growing by 8.6% although the number of North American companies on the list keeps decreasing.

• China added 15 companies to the list, to a total of 75 companies and spending rose to $20.5 billion, although this was a growth rate of 35.8%—half of the five-year annualized growth rate of 63.9%—reflecting the country’s rate of economic expansion.

Overall, investment in innovation is increasing at the fastest rate in China, followed by Europe, Japan and North America, although the trend in North America is slowing. Yet, while investment is increasing, it is not having an impact on the repositioning of the Top 10 Most Innovative Companies. Why not? What are the Most Innovative Companies consistently doing to maintain their top spots year after year?

What Are the 2013 Top 10 Most Innovative Companies?

It is no surprise that the companies that earn a spot on this Booz & Company’s list are well known (Jaruzelski, Loehr and Holman, 2013). In 2013, the companies that made the list, in order, were: Apple, Google, Samsung, Amazon, 3M, GE, Microsoft, IBM, Tesla Motors, and Facebook. This presents little change since the inception of the list in 2010: Seven of these 10 companies have held a spot on this list since 2010 with little change in rank. The market’s perception of innovativeness remains consistent.

• Apple leads the Top 10 list for the fourth year, increasing its R&D spending to $3.4 billion, almost $1 billion more than 2012, and raising its overall spending rank to 43.
• Google remained at number two, spending $6.8 billion and ranking 12 in overall spend. 50% of respondents mentioned it, up 7% from 2012.

• Samsung climbed to number 3, replacing 3M and proving its design prowess with Galaxy Smart Phone, Smart TV and other inventive products.

• Amazon jumped from number 10 to number four, proving its innovation skill through some of its cloud service offerings.

• Tesla Motors joins the list at number nine, spending two-thirds of its revenue on innovation, as is expected of startup company.

• Facebook rejoins the list at number 10, bolstered by its mobile strategy and spending $1.4 billion for an overall rank of 101.

• The Top 10 Most Innovative (dominated by Software and Internet) again perform much better than the Top 10 Spenders (dominated by Auto and Healthcare), surpassing them in terms of five-year revenue and market cap growth.

Interestingly, only two of these companies are on the Top 10 Biggest Spenders list. And, for the fourth straight year, no Healthcare Company has made the list although innovation spending in the Healthcare industry significantly contributes to the overall innovation spending of the Top 20 biggest spenders.

Is There a Correlation Between R&D Spending and Financial Results?

Beyond the financials, each year Booz &Company selects one macro aspect of the innovation cycle to examine in depth. Early on in its analysis, it begins categorizing each of the top 1,000 companies into three fundamental types of innovation strategies: Needs Seekers, Market Readers, and Technology Drivers.
Needs seekers actively and directly engage current and potential customers to shape new products and services based on superior end-user understanding, and they strive to be first to market with those new offerings. Booz & Company identifies several key factors to this strategy; first, the ability to generate new ideas and convert them into product development efforts. It calls this the “ideation stage.” Second, the company identifies the development of a variety of consistent, manageable ideation practices and principles for moving ideas into the development stage. It calls this the “conversion stage.” I argue that these descriptions are key definitions of the design practice, and the fact that Booz & Company does not overtly recognize this is evidence of the ambiguity of design in the business conversation, in spite of IDEO and others efforts to socialize “design thinking.” It is also evidence of why design firms label themselves “innovators”: to connect with a more familiar, relatable business message. Booz & Company also argues that "internal champions"—people assigned to coordinate the capture, development, and internal promotion of new ideas—followed by "cross-functional collaboration" among different business units were the most effective internal mechanisms their companies used to push new ideas. This is, by my definition, the noun role of design in an organization—the role of change agent executing design core competencies of collaboration and facilitation. This categorization suggests more mature empathic strategies and behaviors as well as decision-making motivations. If we were to continue the research and application of the SCM, I hypothesize that we would find higher-level empathic positions for each of the elements of good design. And if we were to analyze these companies' successes in bridging the innovation gap, I theorize that we would find better, more consistently positive results using a more reliable approach to developing a strategy to address the gaps.

Market readers watch their customers and competitors carefully, focusing largely on creating value through incremental change and by capitalizing on proven market trends. Booz & Company argues that the strategies of these companies primarily include further development of their own products or products already introduced by competitors. They rely on traditional market research to understand what is working in their markets, and they turn to internal customer support and sales teams for ideas about how they can improve
products they already have in market. They leverage communities of practice, focused innovation networks and customer and supplier networks to identify opportunity gaps. This approach is more internally focused and identifies incremental development that may or may not address an existing market pain point and may or may not have been customer vetted before market launch. While there is evidence of the early maturity stages of design integration and core competencies and practices, the primary focus is internal. If we were to continue this research and the application of the SCM, I hypothesize that we would find more mid-level empathic positions for a selection of the elements of good design. Again, if we were to analyze these companies' successes in bridging the innovation gap, I speculate that we would find mixed results and an inconsistent approach to developing strategy to address the gaps.

Technology drivers follow the direction suggested by their technological capabilities, leveraging their investment in research and development to drive both breakthrough innovation and incremental change, often seeking to solve the unarticulated needs of their customers via new technology. The key behaviors include self-reliance and inward-looking conversations based on the latest advances in technology. They conduct regular external idea and technology scouting and regular meetings of their own experts and communities of practice across company business units to conduct technology road mapping. Innovation champions are used at a much lower rate, and ideas may not be fully attuned to markets and customers. Many of these companies do little to mitigate this risk with the use of ideation tools or practices. These companies take a "create it, show that it can be done, then figure out how to take it to market" approach to innovation. If we used the SCM to analyze these companies, I hypothesize that we would find that many elements of good design do not reach the level of Sympathy in the model. And if we examined their performance on the backdrop of the Innovation Gap model, I theorize that we would find they are very good at developing new ideas and penetrating the early adopters but rarely find success in overcoming the gap to market adoption. Even so, there is still a big role for these types of incubator companies in the market. If they are insightful, they recognize their strength as experts in developing innovations, not translating and marketing an idea en
mass. So, finding the right partner, or selling the innovation outright, allows them to achieve success in their sweet spot and continue to benefit from the role of incubator.

Using these categories as a backdrop, Booz & Company continues its examination of each company’s innovation capabilities, ranging from talent, knowledge, and team structures, to its selection and use of digital tools and processes. It considers these factors as the key capabilities that enable each company to perform the specific functions of each R&D value chain stage—ideation, project selection, product development, and commercialization. Here is what it asserts its research has found:

• In 2010, it examined which sets of capabilities are the most crucial for the success of each innovation strategy and determined the most successful innovators are “good at the right things, not at everything” (Jaruzelski and Dehoff, 2010).

• In 2011, it examined the ways that organizational systems and cultural attributes support innovation strategies and determined the most critical factors are “having common innovation goals and common cultural attributes” (Jaruzelski, Loehr and Holman, 2011).

• In 2012, it examined the early stages of innovation when companies are generating ideas and making decisions about which ones to develop and determined the most successful innovators are the ones who are “consistently able to bring clarity to a fuzzy front-end process” (Jaruzelski, Loehr and Holman, 2012).

• In 2013, it examined how the most successful companies are collecting and using big data and powerful analytical tools to transform innovation—from the early stages of customer insight all the way through the process to product launch. It deduces that the market is showing signs of being on the early stages of a digital revolution that will transform how innovation is done (Jaruzelski, Loehr and Holman, 2013).

Repeatedly, it reports that there is no long-term correlation between innovation spending and overall financial performance. Instead, it finds the selection of an innovation strategy and its alignment with the overall
business strategy, in combination with the innovation capabilities and decision-making processes, enables the most successful companies also to be the most innovative companies. It argues that the companies that craft a tightly focused set of innovation capabilities in line with their particular innovation strategy will get a better return on the resources they invest in innovation.

A Comprehensive Look at Booz & Company’s Body of Research

When we take a more detailed look at Booz & Company’s research, we can dissect these assertions categorize them into key inter-related themes. The companies that perform the best follow a “Needs Seeker” innovation strategy. There are common processes these companies use to support this strategy but ultimately, they argue, it does not matter which processes are used as long as they are followed in a disciplined way. These processes include the following key design competencies: customer observation and focus groups; idea workout sessions; engagement through social networking channels; deep analytics using customer data; formal innovation champion roles; cross-unit staffing; formal idea conferences; communities of practice; external channel partners; and suppliers including partnerships with universities, third party companies, and government agencies.

Booz & Company strongly advocates that a company’s corporate culture must sustain a Needs Seeker orientation. The tighter the alignment of the innovation strategy within the culture, the more differentiated the organization can become in the market. In the 2011 report (Jaruzelski, Loehr and Holman, 2011), they cite key cultural differentiators for Needs Seeker organizations:

• Maintain customer alignment—having and maintaining a strong identification with the customer and overall orientation toward the customer experience.

• Position a common innovation goal—creating advantaged products and services through superior product performance and quality is the ideal common goal.
• Drive a cultural openness to new ideas from customers, suppliers, competitors and other industries.

• Integrate technology capabilities built on disciplined processes that enable deep customer insights.

• Develop a strong and consistent ability to execute strategy.

• Cultivate a long-term commitment from senior leadership—Companies need CEO support and a direct reporting structure for technical leads.

Booz & Company believes that innovation capabilities are founded in strategic organizational systems and capabilities; and that these systems are significant. Strategic organizational capabilities include talent recruitment, team structures and tools, and processes. It argues that Needs Seeker capabilities form a systemic set of skills, processes and tools, and they need to overlap with knowledge of technology and product platform management. Many companies are better at aligning capabilities with their innovation strategy in the areas of ideation conversion and product development but struggle with weaknesses in commercialization (including global launch, pilot selection and rollout) and operational excellence (manufacturing, logistics, sales and marketing).

In Booz & Company’s most recent report, it contends that digital tools are transforming innovation across the R&D life cycle and can be disruptive game changers. “If customer insight is the next frontier of innovation, these digital tools will be game changers” (Jaruzelski, Loehr and Holman, 2013). Digital tools are expanding past their mature role of productivity in the development life cycle stage to the early front-end stage where they are playing transformational roles in customer insight, visualization and simulation modeling, and prototyping activities. I argue that the top performing companies are using these tools to look for the “opportunity gaps” and to generate value-based insights, key outputs of the design practice. The report also suggests mature empathic behaviors and strategies for good design that, I argue, would place them further upstream on the Sempathy Continuum Model.
The companies that currently use these tools are primarily Needs Seekers, and they, again, leverage these tools to create a competitive advantage. “Fully 62 percent of respondents from companies we identified as Need Seekers make significant use of digital enablers, compared with just 48 percent of Technology Drivers and a mere 25 percent of Market Readers. And of those Needs Seekers, nearly 60 percent indicated they outperformed their competitors financially” (Jaruzelski, Loehr and Holman, 2013). They go on to maintain that these companies understand the transformative power of the tool/technology/technique and adopt deployment strategies that enable their organization to leverage them. They recognized that the tools combined with training are key, not only so the functionality of the tool is understood, but more importantly to develop the skill of thoughtfully applying the tool to actual business problems to gain insights that guide solutions.

I think it is interesting that this research is still vague about how companies develop these capabilities. In all assessments, we see key core competencies from design; having the right people, integrated across the organization, collaborating and facilitating strategy based on customer insights formed by developing knowledge about and an empathic connection with customers. In the digital tools assessment, we see further evidence of key design core competencies. The practice of using these tools significantly involves customer feedback in the development of visualizations, model and concept iterations to develop meaningful artifacts. The companies that use these tools are deploying collaborative environments including customer immersion labs that include CAD software used for 3D digital modeling, visual simulation and electronic visualization capabilities that are used to create holograms of built environments, and rapid prototyping tools that are used for 3D printing. These design core competencies help manage ambiguity and engage the intended consumer in the design process. Again, referring back to the SCM, I argue that the key to building a design-driven organization—the how—is by quantifying the elements of good design in these areas to understand a company’s functional capabilities in each area and build the capability appropriately to move the up the pyramid, creating richer, more actionable insights and more valuable outputs.
If we look holistically at the Booz & Company’s body of work, I maintain that it focuses heavily on six of the 12 elements of the SCM model: 1) **spark**—where the next good idea comes from; 2) **process**—collaboration, research, iterative use of prototypes, refinement based on feedback; 3) **tools**—use of technology to open up new ideas and focus of exploration to generate better ideas, faster; 4) **growth**—the organization’s ability to define and stay true to strategic growth objectives; 5) **functional**—how well products respond to the needs or desires of the people who will use them; and 6) **emotional**—connecting with users on a personal level. Yet, the company is silent on the topics of aesthetics, experience, systems, sustainability, strategic planning and systemic integration. This has some interesting implications. It suggests six key overlapping points between design and innovation—the space in which innovation and design ebb and flow. And six key points of differentiation—the space owned by design: 1) **aesthetics**—refers to the human perception of beauty; 2) **sustainable**—meeting the needs of the present without compromising the needs of future generations; 3) **experience**—how the organization shapes and orchestrates the six dimensions of interacting with an artifact; 4) **community**—how the organization acknowledges and integrates value systems and beliefs of organized groups of people into their planning and execution; 5) **strategic planning**—refers to activities and organized services within communities; and 6) **systemic integration**—the balance of functioning, whole, complex systems for living, working, playing, and learning in societies.

It presents interesting consistencies about how companies start the journey to build design-driven organizations. Of these five factors, aesthetics is often a “first point of entry” for design into an organization as it is the stereotype for design as a verb—to make things look better, to integrate beauty into an object, often refining the more practical, “what is possible” (Buchanan, 1992) engineering approach with aesthetically appealing form. I would argue that the introduction of aesthetics into an organization addresses the interest and awareness stages of empathy as it relates to design and design-thinking practices. Following that introduction and to progress up the SCM, the organization also opens the door for design as a noun—a change agent and facilitator—creating the opportunity to disseminate design core competencies throughout
the organization and the opportunity to impact the other four elements of good design: the six dimensions of experience; new systems and methodologies to influence spark; a sustainability platform that influences brand position and possibly a different understanding of the communities of influence as it relates to the product adoption cycle and even the societal impact that their business could have on cultures that they influence.

I theorize that these five elements may be the keys to creating design-driven organizations. These are certainly five areas in which designers care deeply and differently than marketing and engineering factions. Booz & Company’s research is silent, to date, on these topics, which lends quite nicely to subsequent rounds of research.

**Future Research**

What does this model mean for an organization? What do organizations need to do to build their design empathic capabilities so they can better understand the articulated and unarticulated needs of their intended audiences? How do they use this framework to create better products, services and experiences that transform people’s lives in meaningful ways? The purpose of this paper is to develop and define the attributes of the SCM from the body of research. It is clear that this work is full of opportunities to further analyze and articulate the role of design practice and empathy in creating design-driven organizations. The next steps are to apply and evaluate the validity of the SCM, and I propose that the necessary body of research includes efforts to apply the model to the Top 10 Most Innovative Companies and the Top 10 Biggest Spenders to test the structure of the model and get key insights to:

- Validate the definitions for each level of empathy and the design core competencies that are represented at each level.

- Understand how the Most Innovative Companies’ SCM models differ from each other.

- Identify the key design elements and necessary levels of empathy that create key differentiation factors that enable them to achieve greater success than their competitors.
• Understand how the Most Innovative Companies’ SCM models differ from the Top 10 Top Spenders who do not make the Most Innovative list.
Chapter Four: Developing Design Talent

To support the understanding of the intersection among students, industry and design education, I worked with DMI on a research project entitled *FuturED: An Analysis of Graduate Design Needs & Education*. We brought together representatives from business, design, and education in a series of facilitated conversations to: (1) define a shared vocabulary around design thinking and design management; and (2) examine the global landscape of design thinking graduate schools. The key interview questions included:

- How do you define design thinking and what are its core principles and competencies?
- What value does design thinking bring to an organization and how do you measure it?
- What are the skills that these companies need to build design competencies and integrate more creativity into their organizations?
- Where is design thinking best taught: in a business school or in a design school?

In addition to the personal interviews, we published an online survey on the DMI website and invited DMI members, IDSA members and general visitors to the DMI website to share their thoughts on the value of design thinking in business, the extent and influence of design thinking’s role in business, and the essential skills of design thinking.

The membership of these organizations is comprised of designers, educators, and business professionals. Of the survey responses, 58% came from self-declared designers, 24% from business professionals, and 18% were from other demographic groups working within the design or academic industries. This creates an overall research bias toward designers considering that the business members of design organizations are probably more inclined to be more familiar with the practice of design and have a predisposition toward design and the
value of design. The summary analysis considers the total group’s responses and several questions are analyzed based on demographics to determine any difference in opinion.

In sum, 61% of respondents indicated that design thinking in business today is an excellent value. When this design versus business respondents responses are analyzed, the results show that both groups have indicated the same excellent value position.

Respondents were asked to rank the following design thinking essential skill sets in order of importance:

- Empathy: 360 Understanding, Reframing the Problem
- Creativity: Ideate, Synthesize Complexities, Visualize Solutions
- Efficacy: Prototype, Test, Execute
- Research: Qualitative and Quantitative Thinking
- Efficiency: Disciplined Process and Tools

Business respondents ranked the most important skills as:

Empathy, Creativity, Efficacy, Research and Efficiency

Design respondents ranked the most important skills as:

Empathy, Creativity, Research, Efficacy and Efficiency

It was interesting that there was consensus on the top two skills but a difference in opinion in the third and fourth place rankings, with designers placing a higher importance on research over efficacy. The statistical analysis showed that there was not a statistically significant difference in these rankings but it suggests there could be some validity to the assertion that designers place a higher importance on making connections through research. This finding warrants additional investigation and analysis.
Overall, the respondents indicated that design thinking’s role and influence was moderately extensive in the areas of Strategy and Execution & Implementation. And there was consensus that design- thinking’s role and influence in management and planning is not extensive. There was no statistically significant difference between the groups in their opinion of the role and influence of design thinking.

Seventy-eight percent of respondents disagreed with the statement: “Design thinking and design practices are best done by people with a degree in a design discipline. Not anyone can learn to do it.” This group was further analyzed to understand their opinion of the most important skills for design thinking and they ranked the skill sets in the same order of importance as the overall response indicated and they concurred that design thinking has the greatest influence in strategy.

To supplement the data collection, over seventy-five practitioners, educators and MBA students gathered in a workshop on August 20, 2013, in Chicago to hear about the preliminary research insights, current trends in education innovations, and to generate new roadmaps for the future of graduate education for business designers. The conference attendees heard from students and practitioners about their requirements and goals for the Designer of the Future. They also heard from numerous academic leaders about the design and business graduate program innovations they are currently developing and actively delivering to meet those goals. In the report we published after the conference, we summarized how the conversation around design thinking is influencing academia. The initial results from this body of research are described in the following discussion.

**Insights from the Interviews and Survey Responses: Empathy Empowers Everyone**

The personal interviews, the responses to the online surveys, and the conversations at the conference were interestingly consistent. The resounding message from this survey research is that empathy is a primary and central principle of design thinking and it is an important and underlying reason that designers conduct all of their activities. Empathy was consistently represented as a thinking strategy through which designers gain an
understanding of their intended audience’s meaning and personal value system(s). Empathy was referred to as an intellectual process of observation that the researcher uses to learn about an intended audience’s culture, perspective, and interpersonal beliefs. This effort to understand the human condition is undertaken so that the business has insight into people’s value systems and can identify opportunity gaps for innovation, strategic direction for new products, experiences and interactions, and an insights into what people might be interested in doing tomorrow. This information is shared—actually, taught—to others who are interested in a specific business goal.

From a business perspective, empathy was used to describe the core principle related to creating a customer-centric organizational culture. The key to this idea is to cultivate an organizational strategy of cross-functional teams and collaboration. In the responses, designers were often positioned in a leadership role in which they are: (1) required, empowered and capable of integrating into the businesses’ cultural ecosystem; and (2) charged with creating the dialogues, activities, and ‘designerly’ spaces that encourage multidisciplinary teams to create. The challenge with this demanding role is that it requires designers to go beyond the skills traditionally taught in degree programs. Designers must now function as teachers and creators of an organizational mind-shift of business values, skills that are often learned “on the job” or in professional programs outside of traditional design schools. Respondents repeated the idea that, in their work, designers are integrating ideas like “making connections,” “making life easier,” “simplicity,” “beauty,” and “elegance” into the organizational language while at the same time communicating in business terms such as “competitive advantage,” “sales,” “revenues,” “costs” and “profit.”

The respondents shared a common view that empathy is difficult on many fronts. First, they acknowledged that, as individuals, we have to make a serious effort to understand people we don’t know. While many people are able to develop and refine their observational skills, it is very difficult to teach observers how to feel and experience another person’s thoughts, responses, and attitudes as their own. This requires a level of emotional intelligence in which the observers, in this case the designers, have a strong sense of self so that they
can open up to other people while maintaining their individual boundaries. This becomes even more difficult when a designer is studying people across cultures and geographies. The respondents responded from their professional experiences that, as designers practice empathy using design tools, they discover that it becomes personally empowering, too, which causes a personal transformation and mind-shift. The responses suggest that, as the designers study what’s happening in other people’s daily lives by spending time with them in the field, they realized that other people’s perspectives, methods, and activities are very diverse. As a result of this field time, the designers concluded that there is no real “wrong or right,” there is just “different.” These personal realizations continue to drive and motivate further investigations in pursuit of new ideas and other insights.

From this research, I conclude that the end result of design thinking activities—predicated on empathy as a broadly humanizing endeavor—is not only about creating the perfect customer experience with the organization, but also about creating new experiences for people in the organization, too. Integrating design thinking within organizations is about empowering people. It is a strategy to create a culture wherein people see the problem or situation in a way that is empowering for them and which helps them author something new. It’s about bringing out the creative energy of individuals and groups in an environment wherein they are empowered to be expressive and more empathetic towards one another.

*Insights from the Conference: The New Graduate is a Creative and Business Minded Individual*

Industry’s overview of the “ideal designer” is a graduate who possess a broad range of business, leadership and “make” skills. Make skills are discussed as deep capabilities to aesthetically visualize, prototype and model. Industry vocalized that they need people who deeply understand and know how to apply the design process as a toolkit for collaboration. Repeatedly, the core principle enabling this deep understanding in the design thinking process is empathy. This is consistent with the survey research responses. The conversation at the conference turned into a lively discussion about the definition of empathy and whether empathy can actually
be taught. There was consensus that empathy could be discussed as the ability to relate and understand another human’s perception of their own personal value. Interestingly enough, it was agreed that empathy is a key core principle of design research and is required to get to the core values of groups and (sub) cultures.

In my view, I believe that this is where designers can and should differentiate themselves in business and that these fundamental skills are taught—consciously and informally, and almost exclusively—in design schools, and this is philosophically different than what is taught in business schools. Ironically, a lot of what is taught in business schools relies on human psychological understandings. For example, from my experience at The University of Cincinnati, the Consumer Behavior, Retail Strategies, Brand Strategy, and International Marketing business classes all have very strong aspects of design research incorporated into the curriculum and there are consistent messages that success is based on deep understanding of the audience to ascertain values and meaning. Yet, there is little to no recognition or discussion of this strategy being associated with the design field. And much of the class reference material seeks to ‘scientifically’ quantify human behavior without ever mentioning empathy.

Following that path, I argue that the ability to understand an individual’s engagement with the larger systemic ecosystem of a corporation, of government, of cultures is the true opportunity for graduate design or MBA education. Design and MBA graduate education should, and must, include a formal analysis and understanding of the design thinking principles, practices and tool sets, leadership and organizational behavior as well as exposure to other social sciences that help graduate develop a rich and diverse understanding of the human psyche. The challenge is how to do this if empathy is hard to teach as a psychological characteristic. It is my opinion that experiential teaching and learning activities that put students in close proximity to the human condition are critical to developing the leaders of the future. Activities such as immersion, observations, interviews, framing/reframing, storytelling, persona development, modeling, divergent/convergent scenario based thinking and other activities that represent emotions, values and beliefs are the concepts that should be developed and mastered to influence organizational philosophies.
and behaviors, and which will enable the organization to achieve the “Sympathy” level on the SCM. Teaching the more advanced thinking strategies such as critical thinking, perspectival/framing, abductive thinking, concrete/abstract thinking, systems thinking, and innovative thinking processes to search for and make connections from seemingly unrelated parts or ideas are the skill sets that will continue the organization’s empathic competencies.

So, if this is the articulated need, we asked how companies are evaluating candidates during the selection and interview process. Again, Industry was very forthcoming and shared the insight that the ideal designer has important cognitive skills that are connected to “awesome craft.” These cognitive skills are much harder to demonstrate in a portfolio, but the portfolio is a key selection tool to making the selection list. Nine themes around these critical cognitive skills emerged:

1. Develop an understanding of the client and have business acumen: know the overarching business goals.

   In the conversation, business acumen was discussed as a body of process knowledge:

   • The ability to map a business including the organization’s social and workflow dynamics,
   
   • The ability to become part of each business’ unique communication language and feedback loops,
   
   • The ability to develop a socialization plan, translated tactically to the ability to persuade, and
   
   • The ability to understand your objective with your internal and external audiences: sell, fund, innovate and visualize.

2. Act with leadership in everything you do and how you do it: create vision and garner support to move ideas and opportunities to fruition.

3. Maintain a willingness to fail – with humility: do so by garnering leadership’s support for making mistakes and incorporating the subsequent knowledge into ongoing work.
4. Be curious: have a desire to engage, to learn, and to teach.

5. Leverage critical thinking: combine logical thinking with poetry.

6. Frame and re-frame the exploration: align business goals with design goals.

7. Have agility and speed in the creation process: understand that having a partial concept to react to is an acceptable end state.

8. Have personality and heart and maintain an awareness of yourself and others: understand your personal biases, be self-directed, be respectful and autonomous, and incorporate feedback.

9. Have confidence to ride the journey to “done” while letting go of the “right” way.

To complement these skills, Industry is also looking for each designer to bring forth an excellence of craft, which includes technical design skills, and an expanding area of specialization:

Stage 1: Establish storytelling and visualization competencies in various formats including sketches, words, and videos in a primary area of interest.

Stage 2: Expand knowledge into another design focus area, such as experience design, service design, graphic, or industrial design to bring a diverse perspective to your projects and conversations.

Stage 3: Build breadth of knowledge into multiple design focus areas.

Stage 4: Become a true hybrid: expand depth into multiple design focus areas.

Industry participants included corporate design practitioners as well as consultant practitioners. This industry subgroup articulated additional “make skill” needs and looks for candidates who have extensive modeling competencies, citing the idea that, at the end of the day, a designer needs to be able to execute on something.
The Student Revolution

In the course of this research, students were asked to define design, which they did by saying it is “bringing form to ideas.” They defined “design thinking” as a process to tackle challenges. They believe that both terms share many of the same fundamental principles, primarily focusing on following a people, or user, centered perspective to develop solutions, products, or systems.

They were also asked why they decided to return to school to pursue a graduate degree. The formally trained designers told us that they want to learn the language and practice of business so they can provide better, more relevant solutions for their companies or clients. The formally trained business students told us they were seeking a program with a broader MBA platform that recognizes the ecosystem of business is changing. They want an alternative, more creative and sustainable approach to their business practices. Both profiles viewed design thinking as a core set of non-traditional problem solving processes to be mastered in graduate education to help them refine their ability to create and implement holistic, innovative, and effective solutions after graduation.

To that end, both types of students are seeking to further their education in what they consider to be more progressive graduate programs that consciously integrate diversity of thought into their approach. Students want their experiences to push previous boundaries and be primarily focused on collaborative, multi-discipline experiences working on ambiguous and complex “Big” or “Wicked” problems that are client or industry sponsored and that integrate practice with theory. They are evaluating and selecting flexible programs in which 1) they are in a program that allows them to contribute to important, real issues while they continue their learning and 2) they influence the construct of their curriculum to correspond with their specific areas of interest. They are looking for programs in which business concepts are presented in a design way, meaning hands-on, professionally challenging and interactive experiences that present concepts students can apply in practical project format. And they want to have the freedom to come up with something new and leverage the freedom to explore those ideas in an educational environment.
At the end of the program, they want to stay connected to their academic mentors as they develop their professional careers. They view their professors as professional coaches who can continue sharing knowledge and experience, as well as network connections, after graduation. The students also believe that their professors are a valuable source of immediate, relevant, and real-time feedback for their graduate programs about the alignment of their skills with the demands of their professional work after graduation. They are disappointed that their programs aren’t asking for or creating any structured feedback channels.

Once they have completed their graduate degrees, former students are choosing employers where they trust that they can grow and develop personally and professionally. They believe that diversity of thought matters and they are looking for places to work where they can have mentors—formal and informal—and where they will have approachable, talented co-workers. Graduates want to work in a place that is very thoughtful about how they create teams and hire staff in a culture that recognizes that making mistakes leads to valuable experiences. They assess these organizational attributes in the interview process. Graduates see this as the first opportunity to collaborate and they believe that the interview conversation is a two-way dialogue that is a direct reflection of their employment experience after they are hired.

When students were asked if they believe their current graduate education is allowing them to master design or design thinking, the consensus was no. Their feedback was that they need more help and more practice with critical thinking and model based decision-making and then translating ideas into tangible solutions. They believe that this type of learning has high impact and that it is underutilized so there isn’t a lot of opportunity to acquire and refine new skills.

**Educator Response: The New Graduate Design And MBA Programs**

The current landscape of design and MBA programs is shifting in response to changing talent requirements from corporations and consultancies – both business and design—innovation practices. Graduate level programs are modifying their approaches and programs to create and offer integrated design and MBA
graduate curriculums predicated on design thinking principles. The academic community's presentations at the conference provided many examples of how design and business programs are adapting their to produce designers and MBAs that have a broader understanding for how the practice of design fits into the practice of business and vice versa. For example, Philadelphia University described its combined design, engineering and commerce program, a team-created multi-disciplinary design thinking and project learning experience for graduate and undergraduate students. Stanford’s dSchool discussed its highly successful endeavor to create studio based, project learning across the Stanford campus as well as notable executive education programs. Stanford focuses on creating multi-disciplinary learning environments and effectively markets the results to engage broader audiences across its campus. Other programs, such as Massachusetts Institute of Technology, Rhode Island School of Design, Weatherhead School of Management at Case Western Reserve University, and the Cleveland Institute of Art discussed their experimentation with non-traditional partnerships to address programming gaps and deliver an integrated design-business experience.

A number of business schools, such as the Rotman School of Management at the University of Toronto, Northwestern University and Darden School of Business at the University of Virginia, have been offering design thinking and design management degrees for some time, creating a place for strategy level, macro design conversations. And some traditional business schools, like Harvard University, have now made design-thinking classes a core requirement for their MBA students.

At the same time, progressive design and art schools, such as California College of the Arts are offering a more strategic design driven MBA, coming from the perspective that design and integrative thinking, sustainability and systems thinking, finance, entrepreneurship, and generative leadership live in a holistic strategic framework. The integrated curriculum focuses on creating experiences based on today’s interdependent markets and ecosystems and emphasizing the need to develop new business models and approaches. There are also emerging non-profit models, such as the Live Well Collaborative at the University of Cincinnati, in which design-thinking is used as a catalyst for innovation by partnering students and faculty from the design,
business and engineering disciplines with outside companies to participate in multi-disciplinary, applied research team projects that seek to co-create new approaches to products and services while simplifying Intellectual Property issues for the funding companies.

**What Does All This Change Mean?**

The personal interviews, online surveys, and conference research reached over 200 design and business consultants, corporate, academicians, and students who gave their insights on the key principles and core competencies of design. While the research outlined the eight key cognitive thinking processes and key leadership characteristics of good designers, the need for more empathy in designers and corporations was a dominant theme. Empathy was discussed as the intellectual process of observation that creates deep and relevant design connections so that organizations have key insights into people’s value systems and can identify innovation opportunity gaps and set strategic direction, create meaningful experiences and interactions, and generate insights into people’s future interests. It was discussed as a key principle in an organization from which I extend the argument that it is the basis for a design driven organization.

Corporations and consultancy firms are increasingly seeking formally trained designers with a broad set of design skills across multiple design expertise. Designers who possess extensive cognitive thinking, business, and leadership skills as well as “awesome” make skills are prized as they can influence the level and position of the organization’s design elements (as outlined in the SCM) and they can successfully execute the noun definition of design, playing the role of change agent in the organization, influencing innovation and empowering individuals.

This presents new challenges for design and business graduate education programs. The pressure from the corporate community and prospective students to produce interdisciplinary graduates is increasing and many programs are responding. Traditional design and business programs are working to integrate their curriculum and focus on real-life, experiential programming to produce more graduates with in-depth cognitive thinking
and “make” competencies. Other programs are starting over from scratch and creating new approaches to education that are driven by design thinking. As the platform for design thinking continues to expand and influence the business community, the demand for graduates with depth and breadth in design focus areas and business and management science will continue to increase. Students will gravitate toward the programs that apply a continuous design thinking approach to their programs and to their curriculum, creating a new role for education as a holistic, collaborative source for networking with corporations and industry experts, and the facilitation of information that can be used to solve macro level problems, not just focus on developing products and services.

As this new type of design MBA graduate continues to grow, this trend will continue to influence the number of companies adopting “needs seeking” innovation strategies and may result in some interesting changes to the Top 1000 Biggest Innovation Spenders list and, more interestingly, will create opportunities to change the members of the Top 10 Most Innovative Companies list. It certainly places additional pressure on these companies to continue to extend the influence and insights from design to maintain a position on this list.
Conclusion

Booz & Company’s extensive study of innovation and investment provides insight into the complementary influence and value of design. The companies that consistently maintain a position on the Top 10 Most Innovative companies are often lauded as design driven companies—companies whose organizational and cultural philosophy combine with their technical design competencies to accelerate their market position and enable them to continuously create disruptive change in their markets. Booz & Company’s “Needs Seeker” customer-centric innovation strategy consistently overlaps with the noun and verb definitions of design. Design as a verb is the synthetic integration of technology, emerging trends, empathic insights, brand, and operations into the consumer interface with the company to generate improved products and experiences for consumers. As a noun, design is defined as the role of organizational change agent that breaks down silos and builds connections where none previously existed to reengineering massive organizations and behaviors to enable a culture that is flexible and mass customizable. Booz & Company’s body of work argues that the needs seeker innovation strategy incorporates key elements of these definitions. Yet, in its evaluation of the Top 1000 and Top 10 companies, Booz & Company never mentions design, its relationship with innovation, or the distinct aspects of these practices.

The DMI research projects demonstrate that the companies that do make the Top 10 Most Innovative lists recognize and understand the importance of design in their culture, and understand that design influences strategy, management, planning, and execution throughout their organizations. These companies rely heavily on key design competencies including empathy, creativity, efficacy, research, and efficiency and believe that design thinking can be taught and practiced by anyone, not just trained designers. As such, they use a broad and deep toolbox of design thinking skills and strategies to leverage diverse sources of inspiration to generate ideas and derive consumer based insights, set strategic direction and cultivate design talent and proliferate design-thinking knowledge, ideate on concepts, and implement holistic consumer experiences.
It’s a challenge to the idea that design adds value if design thinking can be taught to, and practiced by, people who are not formally trained designers. If this is the case, what unique value do designers contribute? The research suggests that empathy—a 360 understanding and Reframing of the Problem—is the most important key design competency followed closely by creativity—the ability to ideate, synthesize and visualize solutions. Again, the challenge is that these characteristics—empathy and creativity—are not traits that designers exclusively own. Adding trained designers and design thinking practices to an organization doesn’t mean that it suddenly transforms into a “design driven” organization.

To create a design driven organization—one that is motivated by finding new and meaningful ways to care for the human condition—one must first understand where its products and services are positioned on the innovation curve, the extent to which the elements of good design are integrated into its practices and development culture, and the range of emotional connectedness it maintains with individuals, communities, societies and cultures. The Sempathy Continuum Model (SCM) was developed to create a platform that synthesizes design competencies with cognitive thinking strategies and emotional capabilities so an organization can baseline its design capabilities, and can develop strategic and actionable plans to extend the influence of design. Future research should be directed toward applying and validating the SCM and its influence and impact on an organization’s design philosophy.

A key insight that resulted from creating the Sempathy Continuum Model is the absence in Booz & Company’s work of any discussion about six elements of good design: 1) aesthetics, 2) sustainability, 3) holistic experience, 4) influence on community, 5) the strategic planning of that influence within those communities, and 6) the impact of an organization on systemic integration. Additional research should be undertaken to evaluate this progression of thought. The idea of The Care Quotient is to acknowledge that designers do care—often more extensively and passionately than their marketing or engineering counterparts—about these elements of good design.
Innovation is a business imperative. It is the lifeblood of every organization, without which customers are lost. The most successful, innovative companies recognize that innovation doesn’t happen without design, which enables connections with individuals, communities, societies, and cultures; and changes existing situations into preferred ones while deriving economic value.
Appendix 1: Bibliography


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Westcott, M. (2014). Personal communications


Appendix 2: Statistical Analysis

The Role Of Design Thinking In Business Today

<table>
<thead>
<tr>
<th># of Respondents Who Commented on Concept</th>
<th>Concept / Idea</th>
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<tr>
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<td>Drive empathy and connect to personal identity/meaning</td>
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<tr>
<td>36</td>
<td>Drive stakeholder value + control market position</td>
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<tr>
<td>24</td>
<td>Drive an integrated organization</td>
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<tr>
<td>21</td>
<td>Drive a creative, learning culture</td>
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Opportunities To Increase Design’s Value In Business

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<td>31</td>
<td>Designers should conduct more research, publish and broad distribution of case studied in their field / Awareness / Across industries / Aimed at business schools / Targeting CEOs</td>
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<td>Measurement / evidence based relationships / correlation</td>
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<td>Designers need to be better advocates and communicators of value proposition</td>
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<td>More inclusion in undergrad and core part of MBA programs of designerly knowledge</td>
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<td>8</td>
<td>Designers need a better understanding of business needs and be educated as senior level executives / Equipped with the language of business</td>
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<td>Designers need to articulate their value in the planning and strategy phases</td>
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### Industry Distribution Of The Responses

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<td>Manufacturing</td>
</tr>
<tr>
<td>26</td>
<td>Internet</td>
</tr>
<tr>
<td>24</td>
<td>Health Care</td>
</tr>
<tr>
<td>22</td>
<td>Retail, Wholesale</td>
</tr>
<tr>
<td>22</td>
<td>Consumer Packaged Goods</td>
</tr>
<tr>
<td>20</td>
<td>Other</td>
</tr>
<tr>
<td>19</td>
<td>Government</td>
</tr>
<tr>
<td>15</td>
<td>Finance, Insurance, Real Estate</td>
</tr>
<tr>
<td>14</td>
<td>Construction</td>
</tr>
<tr>
<td>#</td>
<td>Category</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>14</td>
<td>Communications, Utilities</td>
</tr>
<tr>
<td>9</td>
<td>Transportation</td>
</tr>
<tr>
<td>7</td>
<td>Biology, Biotech</td>
</tr>
<tr>
<td>5</td>
<td>Agriculture, Mining</td>
</tr>
<tr>
<td>2</td>
<td>Tourism</td>
</tr>
<tr>
<td>2</td>
<td>Philanthropy</td>
</tr>
<tr>
<td>2</td>
<td>Human Resources / Recruitment</td>
</tr>
<tr>
<td>2</td>
<td>Architecture and Land Development—Urban Design</td>
</tr>
<tr>
<td>1</td>
<td>Startups / Incubating</td>
</tr>
<tr>
<td>1</td>
<td>Research / Strategy</td>
</tr>
<tr>
<td>1</td>
<td>Publishing, Advertising, Packaging</td>
</tr>
<tr>
<td>1</td>
<td>Management Consulting</td>
</tr>
<tr>
<td>1</td>
<td>Innovation sector</td>
</tr>
<tr>
<td>1</td>
<td>Furniture</td>
</tr>
<tr>
<td>1</td>
<td>Digital Media</td>
</tr>
<tr>
<td>1</td>
<td>Culture</td>
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Demographic Distribution of Responses

<table>
<thead>
<tr>
<th>Count</th>
<th>Percent</th>
<th>Category</th>
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</thead>
<tbody>
<tr>
<td>37</td>
<td>24%</td>
<td>Business</td>
</tr>
<tr>
<td>88</td>
<td>58%</td>
<td>Design</td>
</tr>
<tr>
<td>3</td>
<td>2%</td>
<td>Engineering</td>
</tr>
<tr>
<td>24</td>
<td>16%</td>
<td>Other</td>
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</tbody>
</table>

Overall Value of Design Thinking In Business Today

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent Value</td>
<td>93</td>
<td>61.2</td>
</tr>
<tr>
<td>Good Value</td>
<td>36</td>
<td>23.7</td>
</tr>
<tr>
<td>Moderate Value</td>
<td>15</td>
<td>9.9</td>
</tr>
<tr>
<td>Low Value</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Business and Design Respondent’s Perception of the Value of Design Thinking and the Key Core Competencies

In this question, the rank order of importance in the survey question ranged from 1 – 5, 1 being the most important. Therefore, in this analysis, a lower mean indicates a higher level of importance. This analysis shows that there is not a statistically different ranking of importance between the business and design respondent’s rankings. However, there is a difference in opinion in the third and fourth place rankings with designers placing a higher importance on research over efficacy.

Business respondents ranked the most important skills as Empathy, Creativity, Efficacy, Research and Efficiency while design respondents ranked the most important skills as Empathy, Creativity, Research, Efficacy and Efficiency. This suggests there is some validity to the assertion that designers place a higher importance on making connections through research. This finding warrants additional investigation and analysis.

<table>
<thead>
<tr>
<th>Group Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q12</td>
</tr>
<tr>
<td>Q10Empathy Business</td>
</tr>
<tr>
<td>Design</td>
</tr>
<tr>
<td>Q10Creativity Business</td>
</tr>
<tr>
<td>Design</td>
</tr>
<tr>
<td>Q10Efficacy Business</td>
</tr>
<tr>
<td>Design</td>
</tr>
<tr>
<td>Q10Research Business</td>
</tr>
<tr>
<td>Design</td>
</tr>
<tr>
<td>Q10Efficiency Business</td>
</tr>
<tr>
<td>Design</td>
</tr>
</tbody>
</table>
Design Thinking’s Role And Influence In Business

<table>
<thead>
<tr>
<th></th>
<th>Strategy</th>
<th>Management</th>
<th>Planning</th>
<th>Execution &amp; Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Extensive</td>
<td>11</td>
<td>9</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Extensive</td>
<td>18</td>
<td>9</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Moderately Extensive</td>
<td>47</td>
<td>37</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Somewhat Extensive</td>
<td>39</td>
<td>41</td>
<td>35</td>
<td>42</td>
</tr>
<tr>
<td>Not Extensive</td>
<td>37</td>
<td>56</td>
<td>48</td>
<td>38</td>
</tr>
<tr>
<td>Average</td>
<td>2.52</td>
<td>2.17</td>
<td>2.34</td>
<td>2.44</td>
</tr>
</tbody>
</table>

Business and Design Respondents Believe That Design Thinking Has the Most Influence in the Same Areas

ANOVA Table

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q10Empathy * Q12 Between Groups (Combined)</td>
<td>3.087</td>
<td>3</td>
<td>1.029</td>
<td>1.291</td>
<td>.165</td>
</tr>
<tr>
<td>Within Groups</td>
<td>117.966</td>
<td>148</td>
<td>.797</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121.053</td>
<td>151</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q10Creativity * Q12 Between Groups (Combined)</td>
<td>.465</td>
<td>3</td>
<td>.155</td>
<td>.227</td>
<td>.280</td>
</tr>
<tr>
<td>Within Groups</td>
<td>100.904</td>
<td>148</td>
<td>.682</td>
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</tr>
<tr>
<td>Total</td>
<td>101.368</td>
<td>151</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Q10Efficacy * Q12 Between Groups (Combined)</td>
<td>5.209</td>
<td>3</td>
<td>1.736</td>
<td>1.640</td>
<td>.877</td>
</tr>
<tr>
<td>Within Groups</td>
<td>156.732</td>
<td>148</td>
<td>1.059</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>161.941</td>
<td>151</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q10Efficiency * Q12 Between Groups (Combined)</td>
<td>2.337</td>
<td>3</td>
<td>.779</td>
<td>.707</td>
<td>.183</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>163.182</td>
<td>148</td>
<td>1.103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>165.520</td>
<td>151</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q10Research * Q12</td>
<td>5.375</td>
<td>3</td>
<td>1.792</td>
<td>1.076</td>
<td>.549</td>
</tr>
<tr>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Combined)</td>
<td>246.388</td>
<td>148</td>
<td>1.665</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>251.763</td>
<td>151</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rank Of The Most Essential Design Thinking Skill Sets**

<table>
<thead>
<tr>
<th>Essential Skills Rank</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Average Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathy: 360 Understanding, Reframing the Problem</td>
<td>96</td>
<td>32</td>
<td>18</td>
<td>4</td>
<td>2</td>
<td>1.58</td>
</tr>
<tr>
<td>Creativity: Ideate, Synthesize Complexities, Visualize Solutions</td>
<td>35</td>
<td>69</td>
<td>41</td>
<td>7</td>
<td>0</td>
<td>2.13</td>
</tr>
<tr>
<td>Efficacy: Prototype, Test, Execute</td>
<td>5</td>
<td>11</td>
<td>44</td>
<td>52</td>
<td>40</td>
<td>3.73</td>
</tr>
<tr>
<td>Research: Qualitative and Quantitative Thinking</td>
<td>10</td>
<td>33</td>
<td>30</td>
<td>35</td>
<td>44</td>
<td>3.46</td>
</tr>
<tr>
<td>Efficiency: Disciplined Process + Tools</td>
<td>6</td>
<td>7</td>
<td>19</td>
<td>54</td>
<td>66</td>
<td>4.10</td>
</tr>
</tbody>
</table>
Agree or Disagree: design thinking and design practices are best done by people with a degree in a design discipline. Not anyone can learn to do it.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>34</td>
<td>22.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>118</td>
<td>77.6</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

For the group that disagrees with the statement, what do they believe are the most essential skill sets for design thinkers?

In this question, the rank order of importance in the survey question ranged from 1 – 5, 1 being the most important. Therefore, in this analysis, a lower mean indicates a higher level of importance.

This analysis shows that respondents who disagree with the statement rank the essential skills in the same order of importance as the total group of respondents suggesting a consistent valuation of skills.